MALABAR COAL



MAXWELL PROJECT

APPENDIX G

Aboriginal Cultural Heritage Assessment

AECOM Imagine it. Delivered.

Aboriginal Cultural Heritage Assessment Report
Malabar Coal Limited
17-Jun-2019

Maxwell Project

Aboriginal Cultural Heritage Assessment

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 Project

Aboriginal Cultural Heritage Assessment

Client: Malabar Coal Limited

ABN: 73 093 876 307

Prepared by

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

17-Jun-2019

Job No.: 60576801

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 AS/NZS4801 and OHSAS18001.

© AECOM Australia Pty Ltd (AECOM). All rights reserved.

AECOM has prepared this document for the sole use of the Client and for a specific purpose, each as expressly stated in the document. No other party should rely on this document without the prior written consent of AECOM. AECOM undertakes no duty, nor accepts any responsibility, to any third party who may rely upon or use this document. This document has been prepared based on the Client's description of its requirements and AECOM's experience, having regard to assumptions that AECOM can reasonably be expected to make in accordance with sound professional principles. AECOM may also have relied upon information provided by the Client and other third parties to prepare this document, some of which may not have been verified. Subject to the above conditions, this document may be transmitted, reproduced or disseminated only in its entirety.

Quality Information

Document	Maxwell Project
Date	17-Jun-2019
Prepared by	Geordie Oakes
Reviewed by	Andrew McLaren

Revision History

Rev	Revision Date	Details	Authorised
			Name/Position
A	10-October-2018	Technical Review	Andrew McLaren (AECOM)
B	17-October-2018	Client Review	William Dean (Malabar Coal Limited)
C	18-Jan-2019	Update with RAP comments	Geordie Oakes (AECOM)
D	17-Jun-2019	Final	Geordie Oakes (AECOM)

Table of Contents

Executive Summary i
1.0 Introduction & Background 1
1.1 Introduction 1
1.2 Project Overview 1
1.3 Study Area 3
1.4 Proponent and Planning Approval Process 3
1.5 Secretary's Environmental Assessment Requirements (SEARs) 3
1.6 Assessment Objectives 4
1.7 Scope of Current Assessment 4
1.8 Project Team 5
1.9 Report Structure 5
2.0 Applicable Policy & Legislation 9
2.1 Commonwealth Legislation 9
2.1.1 Aboriginal and Torres Strait Islander Heritage Protection Act 1984 9
2.1.2 Native Title Act 1993 9
2.1.3 Environment Protection and Biodiversity Act 1999 10
2.2 State Legislation 10
2.2.1 Environmental Planning and Assessment Act 1979 10
2.2.2 Aboriginal Land Rights Act 1983 11
2.2.3 National Parks and Wildlife Act 1974 11
2.3 Local Government 12
2.3.1 Muswellbrook Local Environmental Plan 2009 12
3.0 Aboriginal Community Consultation 13
3.1 Stage 1 - Notification and Registration 13
3.1.1 Consultation with Regulatory Agencies 13
3.1.2 Public Notification 14
3.1.3 Invitations for Expressions of Interest 14
3.1.4 Notification of Registered Aboriginal Parties (RAPs) 15
3.2 Stage 2 - Presentation of Information about Project 15
3.3 Stage 3 – Gathering Information about Cultural Significance 16
3.3.1 Draft Assessment Methodology 16
3.3.2 Archaeological Survey 17
3.4 Stage 4 - Review of Draft Assessment Report 18
4.0 Landscape Context 21
4.1 Physical Setting 21
4.2 Topography 21
4.3 Hydrology 22
4.4 Geology 22
4.5 Soils 23
4.6 Flora & Fauna 29
4.7 Historical Context 29
4.8 Land Use 31
4.9 Key Observations 36
5.0 Ethnohistoric Context 37
5.1 Introduction 37
5.1.1 Language Groups and Boundaries 37
5.2 Social Organisation 41
5.3 Settlement and Subsistence 41
5.4 Material Culture 42
5.5 Ceremony and Ritual 46
5.6 Post-contact History 47
6.0 Archaeological Context 49
6.1 Regional Context - The Hunter Valley 49
6.1.1 Introduction 49
6.1.2 Open Artefact Sites: Distribution, Contents and Definition 49

6.1.3 Flaked Stone Artefact Technology 51
6.1.4 Aboriginal Stone Quarrying: Australia & the Hunter Valley 54
6.1.5 Chronology and Texture-Contrast Soils 56
6.1.6 Occupation models 57
6.2 Local Archaeological Context 65
6.2.1 AHIMS Database 65
6.2.2 Previous Archaeological Investigations within the Study Area 66
6.3 Archaeological Predictions 70
7.0 Archaeological Survey 71
7.1 Survey 71
7.1.1 Aim and Objectives 71
7.1.2 Methodology 71
7.1.3 Site Definition 71
7.2 Survey Results 72
7.2.1 Survey Coverage and Effective Coverage 72
7.3 Surface Artefacts 73
7.3.1 Current Archaeological Survey 73
7.4 Sites 75
7.4.1 Open Artefact Sites 77
7.4.2 Stone Quarries 77
7.5 Spatial Distribution 78
7.5.1 Distance to Watercourse 78
7.5.2 Landform Analysis 79
7.6 Archaeological Sensitivity: Subsurface Archaeological Potential 80
7.7 Evaluation of Predictive Model 85
7.8 Summary of Results 86
7.9 Discussion 86
8.0 Significance Assessment 89
8.1 Principles of Assessment 89
8.2 Scientific Value 89
8.2.1 Rarity and Representativeness 90
8.2.2 Research Potential 90
8.2.3 Identification Process for Current Assessment 91
8.2.4 Assessment of Scientific Significance 91
8.3 Social (Cultural) Value 99
8.3.1 Cultural Landscape 100
8.3.2 Landscape Features 100
8.3.3 Aboriginal Dispossession and Resistance 100
8.3.4 Vegetation 100
8.3.5 Mount Arthur Burial 101
8.4 Historic Value 101
8.5 Aesthetic Value 101
8.6 Statement of Significance 101
9.0 Impact Assessment 104
9.1 Summary of Proposed Impacts 104
9.2 Impacts to Identified Aboriginal Sites 104
9.2.1 Surface Development 104
9.2.2 Underground Mining 105
9.3 Impacts to Cultural Values 106
9.4 Cumulative Impact Assessment 106
9.4.1 Assessment of Ecologically Sustainable Development (ESD) 106
9.4.2 Intergenerational Equity - Cumulative Impact Assessment 107
9.4.3 Known Resource 107
9.4.4 Potential Resource 107
9.4.5 The Precautionary Principle 109
10.0 Avoiding and Minimising Harm 111
11.0 Management Recommendations 112
11.1 Statutory Requirements 112

11.2 Management Strategy 112
11.2.1 Archaeological Salvage Program 112
11.2.2 Conservation of Non-impacted Sites 113
11.2.3 Subsidence Monitoring 113
11.2.4 Aboriginal Cultural Heritage Awareness Training 113
11.2.5 Previously Unrecorded Aboriginal Archaeological Evidence 114
11.2.6 Management of Potential Human Remains 114
11.2.7 AHIMS Site Cards 115
11.2.8 Aboriginal Site Database 115
11.3 Summary of Management Mitigation Measures 116
12.0 References Cited 127

Appendix A
Cultural Values Report

Appendix B
Cadastral Information

Appendix C
Project Sears

Appendix D
Agency Letters

Appendix E
Agency Responses

Appendix F
Advertisement: Hunter Valley News

Appendix G
OEH and LALC Notification

Appendix H
Draft Assessment Methodology

Appendix I
RAP Responses to Draft Report

Appendix J
Consultation Log

Appendix K
Lithic Data

Appendix L
Site Cards

Appendix M
Subsidence Assessment Extracts

Appendix N
Salvage Methodology

List of Figures

Figure 1	Regional Context	6
Figure 2	Project General Arrangement (Source: Malabar 2019)	7
Figure 3	Study Area	8
Figure 4	Elevation Profile	25
Figure 5	Landform & Hydrology	26
Figure 6	Surface Geology	27
Figure 7	Soil Landscapes	28
Figure 8	1958 aerial photograph of the study area (Source: Land & Property Information NSW)	32
Figure 9	1967 aerial photograph of the study area (Source: Land & Property Information NSW)	32
Figure 10	1974 aerial photograph of the study area (Source: Land & Property Information NSW)	33
Figure 11	1989 aerial photograph of the study area (Source: Land & Property Information NSW)	33
Figure 12	1998 aerial photograph of the study area (Source: Land & Property Information NSW)	34
Figure 13	2009 aerial photograph of the study area (Source: Land & Property Information NSW)	34
Figure 14	Disturbance Mapping	35
Figure 15	Excerpt from Tindale's (1974) tribal map (Tindale, 1974)	38
Figure 16	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)	39
Figure 17	Moore's (2000) reduction model for the technology of Hunter Valley microlith assemblage (from Moore 2000: 29, Fig. 5)	54
Figure 18	AHIMS Sites	69
Figure 19	Survey Coverage	81
Figure 20	Surface Artefacts	82
Figure 21	Aboriginal Sites	83
Figure 22	Archaeological Sensitivity	84
Figure 23	Significance Assessment	103
Figure 24	Impact Assessment	110

List of Tables

Table 1	Registered Aboriginal Parties	14
Table 2	RAP responses to draft methodology	16
Table 3	RAP field representatives by organisation	17
Table 4	RAP responses to draft ACHAR	18
Table 5	Morphological landform units within the study area	22
Table 6	McCarthy's Eastern Regional Sequence (ERS) of stone artefact assemblages	52
Table 7	Hiscock's relative dating scheme for the Sandy Hollow 1 flaked stone assemblage (after Hiscock 1986a: 100)	53
Table 8	Aboriginal occupation models for the Hunter Valley	58
Table 9	Site search results (20 x 20 km area)	65
Table 10	Sites within the study area	66
Table 11	Sites by surface development and underground mining	66
Table 12	Effective coverage data for the current survey	73
Table 13	Simplified typological breakdown of artefacts	74
Table 14	Descriptive statistics for the size of artefacts	74
Table 15	Simplified typological breakdown of artefacts	75
Table 16	Aboriginal archaeological sites within the study area recorded by AECOM 2019	75
Table 17	Relationship between watercourses distance/stream order and artefact counts (current assessment)	78
Table 18	Relationship between watercourses distance/stream order and artefact counts (combined)	79
Table 19	Artefact distribution in relation to landform (current assessment)	79
Table 20	Artefact distribution in relation to landform (combined)	79
Table 21	Evaluation of Predictive Model	85
Table 22	Values relevant to determining cultural significance, as defined by The Burra Charter (ICOMOS 2013)	89
Table 23	Scientific significance assessment	91
Table 24	Impacted sites	104
Table 25	Land use analysis for study region (20 x 20 km)	108
Table 26	Summary of mitigation measures	116

Executive Summary

AECOM Australia Pty Ltd (AECOM) was commissioned by Malabar Coal Limited (Malabar) to complete an Aboriginal cultural heritage assessment for the Maxwell Project, a proposed underground coal mine, located to the east-southeast of Denman and south-southwest of Muswellbrook, within the local government area of Muswellbrook, New South Wales (NSW). This assessment forms part of an Environmental Impact Statement (EIS), which is being prepared to support a Development Application for the Maxwell Project in accordance with Part 4 of *the Environmental Planning and Assessment Act 1979* (EP&A Act).

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

The study area for this assessment encompasses the proposed underground mining area, inclusive of a potential impact zone buffer, as well as land required for surface development areas (Figure 2). Combined, these areas produce a study area of c. 2,330 hectares (ha) that extends south of the existing Maxwell Infrastructure as a thin transport and services corridor, expanding to a roughly circular area south of the Saddlers Creek and north of the Hunter River. The majority of land within the study area has historically been used for grazing.

Searches of the Aboriginal Heritage Information Management System (AHIMS) database were undertaken on 11 May 2018 for a 20 x 20 kilometre (km) area surrounding the study area resulting in the identification of 1,621 Aboriginal sites, comprising 1,594 open artefact sites (i.e., isolated artefacts and artefact scatters) (18 of which have associated areas of Potential Archaeological Deposit [PAD]), 15 modified trees (two with associated artefacts), five grinding groove sites, four stone quarries, one area of PAD, one midden and one burial (Table 9).

Consideration of the location of previously recorded Aboriginal sites indicates that 231 are located wholly or partially within the study area comprising 227 open artefact sites (i.e., artefact scatter and isolated artefacts), two modified trees and two stone quarries. From these sites, it is noted that the two modified tree sites (AHIMS #37-2-1945 and 37-2-1944) were assessed by Registered Aboriginal Parties (RAPs) and an arborist as not Aboriginal sites as part of the Drayton South Coal Project (AECOM 2012) and updated site cards submitted to the Office of Environment and Heritage (OEH). It is also noted that stone quarry site 'SC-QS-1/Quarry' (AHIMS# 37-2-1955) recorded by Mills (2000) within the study area was not located during AECOM's (2012) assessment or the current assessment.

Taking into account the above issues, a total of 228 Aboriginal sites comprising 227 open artefact sites and one stone quarry are recognised as being located wholly or partially within the study area. Considered of the location of previously recorded sites in relation to project elements indicates the following:

- 23 sites (all open artefact sites) are located wholly or partially within the proposed surface development areas;
- 203 sites (202 open artefact sites and one stone quarry) are located wholly or partially above the proposed underground mining area; and
- two sites (both open artefact sites) are located wholly or partially within both the proposed surface development areas and above the proposed underground mining area.

A field team of two AECOM senior heritage specialists (Geordie Oakes and Dr Darran Jordan) and RAP representatives completed an archaeological survey of the study area over nine days (15-17, 20-24 August 2018 and 24 October 2018). As noted in both Section 3.0, and the project methodology issued to RAPs on 19 July 2018, archaeological survey was proposed and completed within those portions of the study area not previously surveyed as part of the Drayton South Coal Project (AECOM 2012). Combined with the AECOM (2012) surveys, the current survey resulted in full survey coverage of the study area. During the survey, a total 47 new Aboriginal archaeological sites comprising artefact scatters and isolated artefacts were identified[1] within the study area.

Taking into account the results of the archaeological survey and previously recorded sites, a total of 275 Aboriginal archaeological sites, comprising 274 open artefact sites (i.e., artefact scatters and isolated artefacts) and one stone quarry have been identified within the study area. These include 228 previously recorded AHIMS sites and 47 new sites recorded during the current survey. Consideration of the location of sites located directly within surface development areas indicates that up to 39 open artefact sites would be wholly or partially impacted by the Project. Consideration of the location of Aboriginal sites located within proposed underground mining areas indicates that 236 sites, comprising 235 open artefact sites and one stone quarry, are located directly above the proposed underground mining area. It is noted that these sites may potentially be affected by cracking of the surface soils due to the effects of mining-induced subsidence.

In addition to completion of the ACHAR, a Cultural Values Report (CVR) was prepared by AECOM and is provided as Appendix A of this ACHAR. It is intended that the CVR be read in conjunction with the ACHAR. 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 are important landscape features such as Mount Arthur, the Hunter River, and Saddlers Creek which surround the study area as well as the Aboriginal objects (i.e., stone artefacts) identified during the archaeological survey for the Project. Landscape features, as well as Aboriginal sites, are often associated with stories or songs and form links along Aboriginal pathways. More broadly, the 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.

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 that this strategy be detailed in an Aboriginal Cultural Heritage Management Plan (ACHMP) for the Project, prepared in consultation with RAPs, and to the satisfaction of the OEH and the Department of Planning and Environment. Subject to the grant of a Development Consent under Part 4, this ACHMP will guide the management of the known and potential Aboriginal archaeological resource of the study area, as well as identified cultural values.

Key elements of the ACHMP would include the following, which are detailed in Section 10.0 of this report:

- an archaeological salvage program;
- subsidence monitoring;
- conservation of non-impacted sites;
- Aboriginal cultural heritage awareness training;
- the procedure for managing previously unrecorded Aboriginal archaeological evidence;
- management of potential human remains;
- completion of AHIMS site cards; and
- management of an Aboriginal site database.

.

[1] Note, six additional sites were recorded outside the study area during the archaeological survey (37-2-5895, 37-2-5894, 37-2-5898, 37-2-5850, and 37-2-5873, 37-2-5863).

1.0 Introduction & Background

1.1 Introduction

AECOM Australia Pty Ltd (AECOM) was commissioned by Malabar Coal Limited (Malabar) to complete an Aboriginal cultural heritage assessment for the Maxwell Project (the Project), a proposed underground coal mining operation, located to the east-southeast of Denman and south-southwest of Muswellbrook, within the local government area (LGA) of Muswellbrook, New South Wales (NSW) (Figure 1).

Underground mining is proposed within Exploration Licence (EL) 5460, which was acquired by Malabar in February 2018. Malabar also acquired existing infrastructure within Coal Lease (CL) 229, Mining Lease (ML) 1531 and CL 395, known as the "Maxwell Infrastructure". The Project would include the use of the substantial existing Maxwell Infrastructure, along with the development of some new infrastructure.

This assessment forms part of an Environmental Impact Statement (EIS) which has been prepared to accompany a Development Application for the Project in accordance with Part 4 of *the Environmental Planning and Assessment Act 1979* (EP&A Act).

This Aboriginal Cultural Heritage Assessment Report (ACHAR) documents the results of AECOM's assessment and has been compiled with reference to the NSW Office of Environment and Heritage's (OEH'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). In addition, this ACHAR should be read in conjunction with the Cultural Values Report (CVR) prepared by AECOM (Appendix A).

1.2 Project Overview

The Project would involve an underground mining operation that would produce high-quality coals over a period of approximately 26 years (Figure 2).

At least 75% of coal produced by the Project would be capable of being used in the making of steel (coking coals). The balance would be export thermal coals suitable for the new generation High Efficiency, Low Emissions power generators.

The Project would involve 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 would be used for handling, processing and transportation of coal for the life of the Project. The Maxwell Infrastructure includes an 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).

A mine entry area would be developed for the Project in a natural valley in the north of EL 5460 to support underground mining and coal handling activities and provide for personnel and materials access.

ROM coal brought to the surface at the mine entry area would be transported to the Maxwell Infrastructure area. Early ROM coal would be transported via internal roads during the construction and commissioning of a covered overland conveyor system. Subsequently, ROM coal would be transported to the Maxwell Infrastructure area via the covered overland conveyor system.

The existing product coal stockpile area at the Maxwell Infrastructure would be extended to allow for better management of different product coal blends. An additional ROM stockpile would also be developed adjacent to the CHPP to cater for delivery of ROM coal via the covered overland conveyor.

The Project would support continued rehabilitation of previously mined areas and overburden emplacement areas within CL 229, ML 1531 and CL 395. The volume of the East Void would be reduced through the emplacement of reject material generated by the Project's coal processing activities and would be capped and rehabilitated at the completion of mining.
A detailed description of the Project will be provided in the main document of the EIS.

The Project would include a number of key components, some of which require surface disturbance, including:

1. Mine entry area to access the underground mining areas – approximately 48 hectares (ha).
2. Transport and services corridor – approximately 104 ha outside of the existing mining disturbance.
3. Potential for re-alignment of Edderton Road – approximately 10 ha.
4. Product stockpile expansion – approximately 5 ha.
5. Other works and ancillary infrastructure.
6. Subsidence zone – area within the underground mining area and surrounds.

Mine Entry Area

The mine entry area would include infrastructure, services and facilities that would support underground mining and coal handling activities and provide for personnel and materials access to the underground mine. The mine entry area would also include ventilation infrastructure.

Transport and Services Corridor

The transport and services corridor would include:

- a site access road from the Maxwell Infrastructure; and
- a covered overland conveyor system to transport ROM coal from the mine entry area to the existing CHPP at the Maxwell Infrastructure.

The transportation of early ROM coal from the mine entry area to the existing CHPP would also occur via the internal roads within the transport and services corridor.

Edderton Road Realignment

Potential subsidence impacts on Edderton Road would be managed through either road maintenance along the existing alignment or realignment of the road around the underground mining area. This ACHAR conservatively assesses the potential impacts associated with realigning Edderton Road. The potential Edderton Road realignment would intersect the Golden Highway approximately 1 kilometre (km) to the west of the current intersection.

Product Stockpile Expansion

It is proposed to increase the capacity of the existing product stockpiles. An additional product stockpile would be constructed to the east of the existing product stockpiles, with a total area of 5 ha (some of which is previously approved disturbance).

Other Works and Ancillary Infrastructure

Other works and ancillary infrastructure would occur outside of the defined surface development areas throughout the life of the Project. These works would include, but not be limited to, environmental and subsidence monitoring activities, remediation of subsidence impacts, exploration, development of service boreholes, site maintenance activities and other minor ancillary works. These surface disturbances would be temporary and isolated in nature. The surface disturbances would occur progressively and these areas would be rehabilitated when no longer required.

1.3 Study Area

The study area for this assessment includes three spatially discrete parcels of land encompassing the proposed underground mining area, inclusive of a potential impact zone buffer, as well as land required for surface infrastructure (i.e., transport and services corridor, Edderton Road realignment, product stockpile expansion, etc.)(Figure 3). Combined, these areas produce a study area of c. 2,330 ha that extends south of the existing Maxwell Infrastructure as a thin transport and services corridor, expanding to a roughly circular area south of Saddlers Creek and north of the Hunter River. The majority of land within the study area has historically, been used for grazing. Components of the Project that will occur on previously mined land have been excluded from the study area for this assessment. Cadastral information for the study area is provided in Appendix B.

1.4 Proponent and Planning Approval Process

Maxwell Ventures (Management) Pty Ltd, a wholly owned subsidiary of Malabar, is seeking consent for the Project under the State Significant Development (SSD) provisions of Part 4 of the EP&A Act and the NSW *Environmental Planning and Assessment Regulation, 2000*. An EIS is being prepared to accompany the Development Application for the Project.

1.5 Secretary's Environmental Assessment Requirements (SEARs)

The Secretary of the NSW Department of Planning and Environment (DP&E) issued the Secretary's Environmental Assessment Requirements (SEARs) for the Project on 3 September 2018, supplementary SEARs on 20 November 2018 and revised SEARs on 17 January 2019 (Appendix C). For Aboriginal heritage, the SEARs require the proponent to undertake:

- *an assessment of the potential impacts of the development on Aboriginal heritage (cultural and archaeological), including consultation with relevant Aboriginal communities/parties and documentation of the views of these stakeholders regarding the likely impact of the development on their cultural heritage;*

In addition to the project SEARs, OEH issued specific requirements (Attachment A) for the project in relation to Aboriginal heritage. These included:

> *5 The Environmental Impact Assessment (EIS) must identify and describe the Aboriginal cultural heritage values that exist across the whole area that will be affected by the development and document these in the Aboriginal Cultural Heritage Assessment Report (ACHAR). This may include the need for surface survey and test excavation. The identification of cultural heritage values should be guided by the Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW (DECCW, 2011) and consultation with OEH regional branch officers.*
>
> *6 Consultation with Aboriginal people must be undertaken and documented in accordance with the Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW). The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the ACHAR.*
>
> *7 Impacts on Aboriginal cultural heritage values are to be assessed and documented in the ACHAR. The ACHAR must demonstrate attempts to avoid impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the ACHAR must outline measures proposed to mitigate impacts. Any objects recorded as part of the assessment must be documented and notified to OEH.*

In preparing this ACHAR the SEARs issued for the Project have been addressed.

1.6 Assessment Objectives

The overarching objectives of this ACHAR are as follows:

- to identify the Aboriginal cultural heritage values of the study area by way of background research, archaeological survey and consultation with Registered Aboriginal Parties (RAPs);
- to assess the potential impact of the Project on the identified Aboriginal cultural heritage values of the study area;
- to provide an appropriate management strategy for avoiding or minimising potential harm to the identified Aboriginal cultural heritage values of the study area; and
- to compile an ACHAR that will assist the Secretary of the DP&E in their assessment of the current SSD application.

1.7 Scope of Current Assessment

This assessment has been undertaken in accordance with the SEARs, clause 80C of the NSW *National Parks and Wildlife Regulation 2009* 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* (Australian Government Department of the Environment 2016).

As such, its key requirements have been:

- to conduct a search of OEH's Aboriginal Heritage Information Management System (AHIMS);
- to review the landscape context of the study area, with specific consideration to its implications for past Aboriginal land use;
- to review relevant archaeological and ethnohistoric information for the study area and environs;
- to prepare a predictive model for the Aboriginal archaeological record of the study area;
- to undertake an archaeological field investigation including detailed survey;
- to identify, notify and register Aboriginal people who hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the study area;
- to provide RAPs with information about the scope of the proposed works and Aboriginal heritage assessment process;
- to facilitate a process whereby RAPs can:
    - contribute culturally appropriate information to the proposed assessment methodology;
    - provide information that will enable the cultural significance of Aboriginal objects and/or places within the study area to be determined;
    - have input into the development of cultural heritage management options; and
- to prepare and finalise an ACHAR with input from RAPs.

1.8 Project Team

Geordie Oakes (Principal Heritage Specialist, AECOM) managed all aspects of the Aboriginal heritage assessment detailed herein and was the primary author of this report. Dr Darran Jordan (Principal Heritage Specialist, AECOM) assisted Geordie with fieldwork. Dr Andrew McLaren (Senior Heritage Specialist, AECOM) provided technical review of this assessment report.

The archaeological survey was undertaken by a combined field team of two AECOM archaeologists (Geordie and Darran) and RAP field representatives (as described in Section 3.3.2).

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 ten years of Australian Aboriginal cultural heritage management experience.

Darran holds a Bachelor of Arts (Honours) degree and a PhD from Sydney University and has over 10 years of Australian Aboriginal cultural heritage management experience.

Andrew holds a Bachelor of Arts (Honours) degree from the University of Queensland, a Master 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 eleven sections. This section - **Section 1.0** - has provided background information on the Project and assessment undertaken. The remainder of the report is structured as follows:

- **Section 2.0** outlines the statutory framework within which this assessment has been undertaken;
- **Section 3.0** details the Aboriginal community consultation program undertaken for this assessment;
- **Section 4.0** describes the existing environment of the study area and its associated archaeological implications;
- **Section 5.0** summarises relevant ethnohistoric information for the study area;
- **Section 6.0** describes the archaeological context of the study area on a regional and local scale. Predictions regarding the nature of the study area's Aboriginal archaeological record are also provided;
- **Section 7.0** describes the archaeological survey methodology and survey results;
- **Section 8.0** assesses the archaeological (scientific) and cultural significance of Aboriginal sites within the study area;
- **Section 9.0** provides an assessment of the potential impacts of the Project on identified Aboriginal heritage values;
- **Section 10.0** provides details on the design of the Project 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 of the study area; and
- **Section 12.0** lists the references cited in-text.

Figure 1 Regional Context

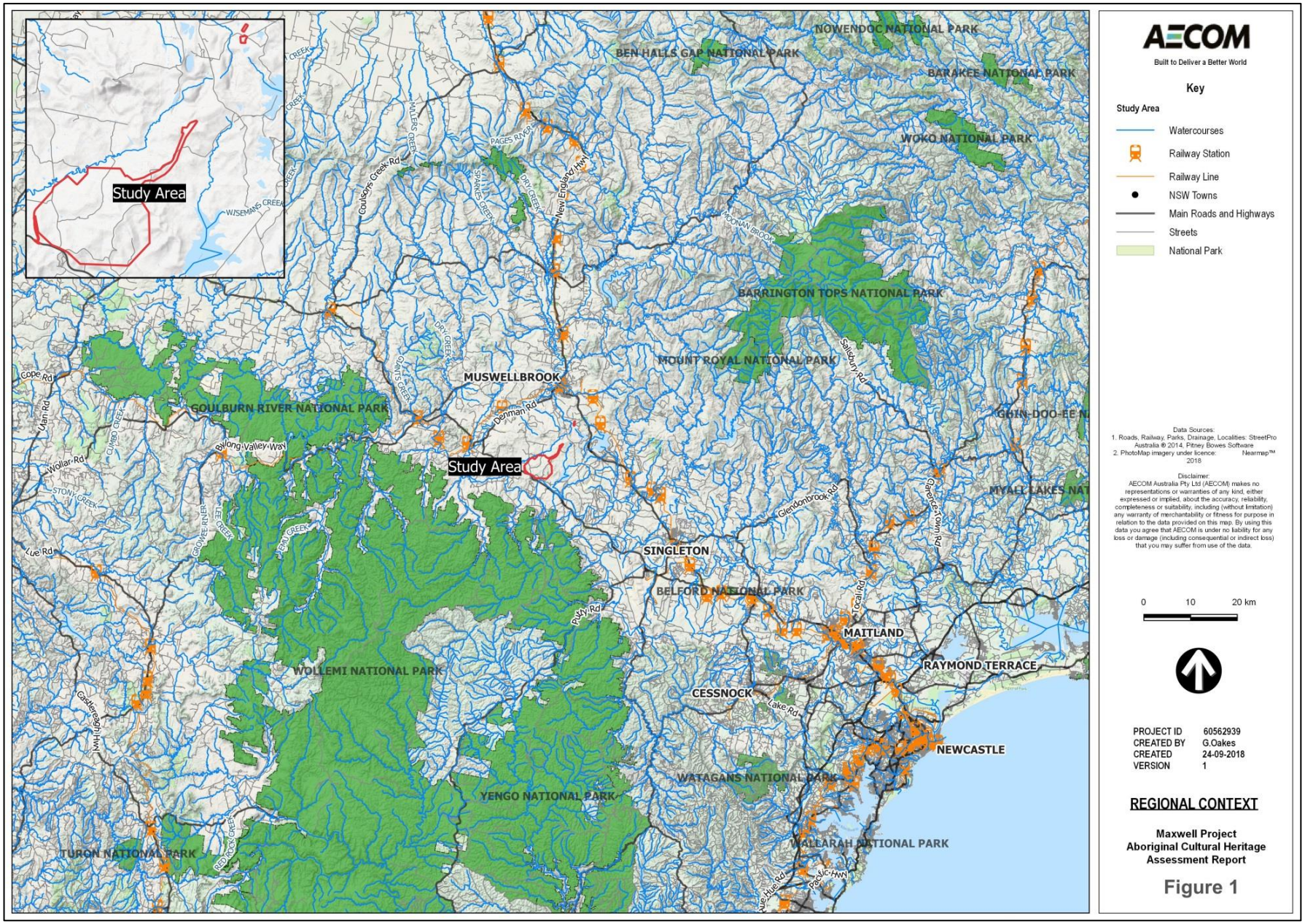


Figure 2 Project General Arrangement (Source: Malabar 2019)

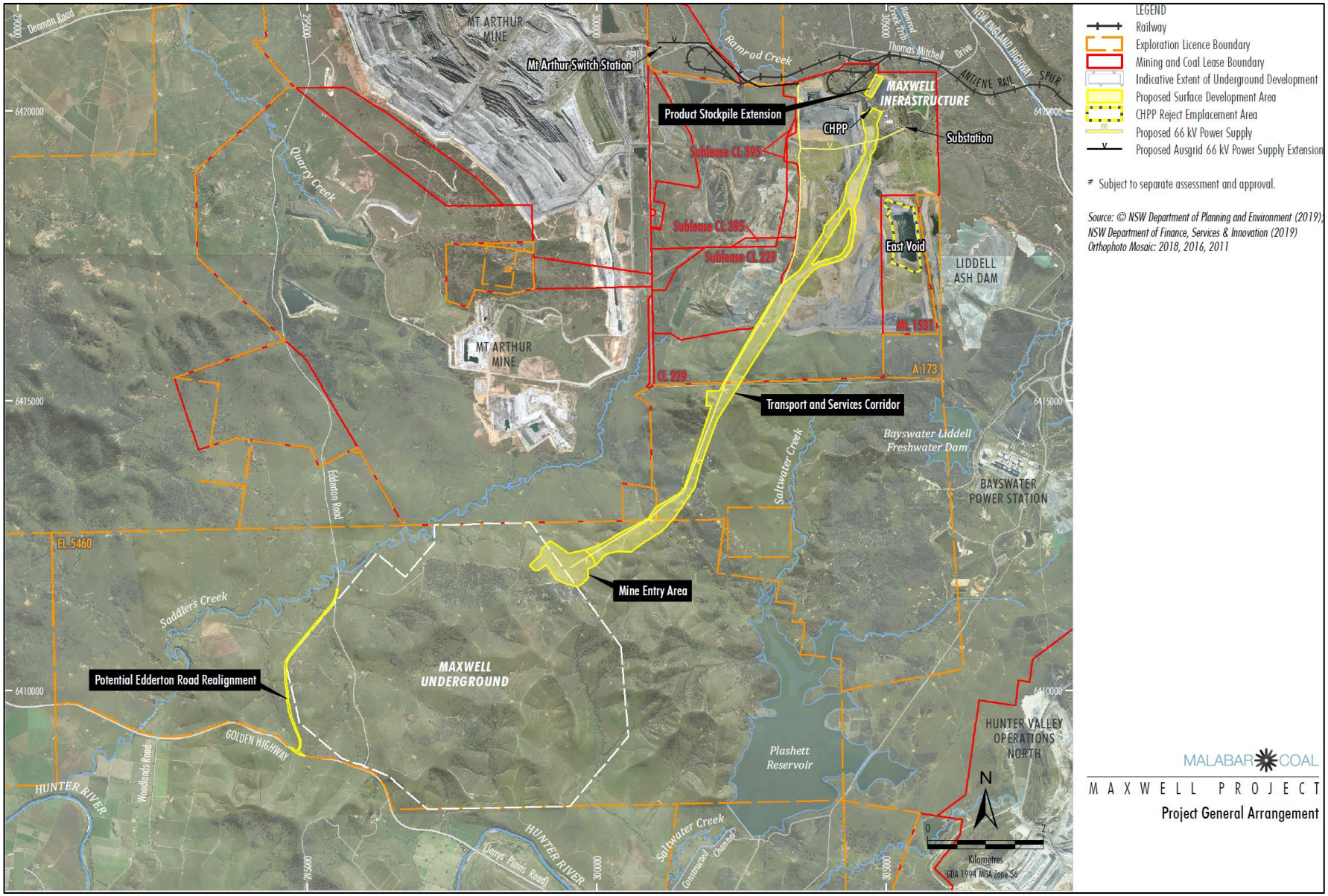
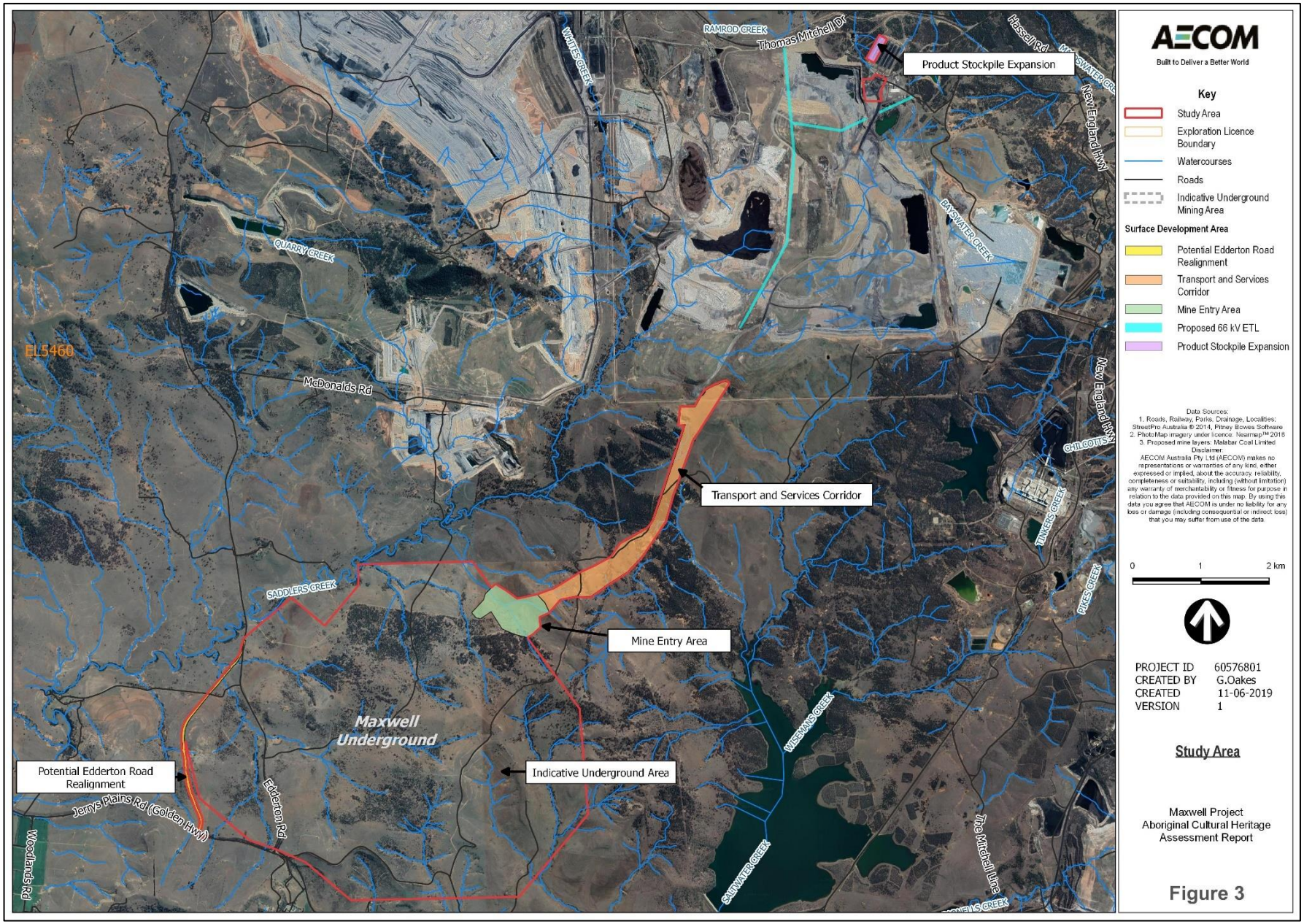


Figure 3 Study Area



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

Under the 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 Minister can only make a decision after receiving a legally valid application under the ATSIHP Act and, in the case of long-term protection, after considering a report on the matter. Before making a declaration to protect an area or object in a state or territory, the Commonwealth Minister must consult the appropriate minister of that state or territory (Part 2, Section 13).

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

2.1.2 Native Title Act 1993

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

Searches of the *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 June 2018, with one Native Title Registration Claim (not determined) identified for the study area - Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People (PCWP) (Claim ID number NC2013/006).

2.1.3 Environment Protection and Biodiversity Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) took effect on 16 July 2000. Under Part 9 of the EPBC Act, any action that is likely to have a significant impact on a matter of National Environmental Significance may only progress with approval of the Commonwealth Minister for the Environment (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 Act, protected heritage items are listed on the National Heritage List (items of significance to the nation) or the Commonwealth Heritage List (items belonging to the Commonwealth or its agencies). These two lists replaced the Register of the National Estate (RNE), which was closed in 2007 and is no longer a statutory list. Statutory references to the RNE in the EPBC Act were removed on 19 February 2012. However, the RNE remains an archive of over 13,000 heritage places throughout Australia.

Searches of the National Heritage List, Commonwealth Heritage List and RNE were undertaken in June 2018, with no relevant listings identified for the study area.

2.2 State Legislation

2.2.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act), administered by DP&E, 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.

Section 4.36 of the EP&A Act stipulates that a development will be considered State Significant Development (SSD) if it is declared to be such by a State environmental planning policy.

Under Clause 8(1) of *State Environmental Planning Policy (State and Regional Development) 2011* (SEPP SRD), a development is declared to be SSD if:

a. the development on the land concerned is, by the operation of an environmental planning instrument, permissible with development consent under Part 4 of the EP&A Act; and

b. the development is specified in Schedule 1 or 2 of SEPP SRD.

The Project is SSD as it meets both of these criteria, namely:

- it is permissible with development consent on the land on which it is located; and
- it is development that is specified in Schedule 1 of SEPP SRD.

Pursuant to 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. Impacts to Aboriginal heritage values associated with approved SSD projects are typically managed under Aboriginal Cultural Heritage Management Plans (ACHMPs), required under the conditions of the consent. ACHMPs are statutorily binding once approved by the DP&E.

Section 89A of the *National Parks and Wildlife Act 1974* (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.

2.2.2 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 Act, administered by the NSW Department of Aboriginal Affairs, is a compensatory regime which recognises that land is of spiritual, social, cultural and economic importance to Aboriginal people. The ALR Act 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 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 June 2018 has indicated that the 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 OEH, is the primary legislation for the protection of Aboriginal cultural heritage in NSW. The NPW Act gives the Secretary of the OEH 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 80B of the *National Parks and Wildlife Amendment (Aboriginal Objects and Aboriginal Places) Regulation 2010* (NPW Regulation), and the demonstration of due diligence.

An Aboriginal Heritage Impact Permit (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 8A 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 typically managed under ACHMPs required under the conditions of the consent. ACHMPs are statutorily binding once approved by the DP&E.

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* (MLEP 2009) 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 MLEP 2009, 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 5.8 of the MLEP 2009 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 MLEP 2009 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 study area.

The consent authority is required to comply with relevant requirements of Clause 5.10 for the Project.

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 OEH's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010a) (Consultation Requirements) and clause 80C of the NSW *National Parks and Wildlife Regulation 2009*. The results of the consultation process undertaken are detailed below. Associated correspondence is provided in Appendices D to J.

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 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 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 OEH;

b. the relevant Local Aboriginal Land Council(s) (LALCs);

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

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

e. NTSCORP Limited;

f. the relevant local council(s); 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 requesting information on relevant Aboriginal persons and organisations (Appendix D):

- OEH;
- Wanaruah Local Aboriginal Land Council (WLALC);
- Office of the Registrar, *Aboriginal Land Rights Act 1983* (NSW);
- National Native Title Tribunal;
- NTSCORP Limited;
- Muswellbrook Shire Council;
- Singleton Council; and
- Hunter Local Land Services (HLLS).

Responses were received from four agencies and are attached as Appendix E:

- 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 study area does not have Registered Aboriginal Owners pursuant to Division 3 of the Aboriginal Land Rights Act 1983 (ALRA) and suggesting AECOM contact the WLALC;
- The National Native Title Tribunal responded on 13 June 2018 indicting that one Native Title Claimant was registered within the study area - Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People;
- Muswellbrook Shire Council responded on 15 June 2018 providing the names of two Aboriginal stakeholder groups - WLALC (CEO Noel Downs) and Hunter Valley Aboriginal Corporation (Manager Ross Pahuru); and
- OEH responded on 15 June 2018 providing the contact details for 50 groups and individuals that may have an interest in the development.

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 and identify its location.

In accordance with this requirement, a public notice was placed in the Hunter Valley News on 20 June 2018 (Appendix F). 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 Local Aboriginal Land Council(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. 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 27 Aboriginal organisations registered an interest in the Maxwell Project. Summary information on all RAPs, including registration dates, is provided in Table 1.

Table 1 Registered Aboriginal Parties

Organisation	Date of registration	Method	Contact Person
DNC	19-Jun-18	Email	Paul Boyd
WLALC	20-Jun-18	Email	Jamie-Lee
Margaret Mathews	20-Jun-18	Phone	Margaret Mathews
Divine Diggers	20-Jun-18	Phone	Deidre Perkins
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

Organisation	Date of registration	Method	Contact Person
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	Tom Miller
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

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 OEH regional office and LALC. Section 4.1.5 of the Consultation Requirements provides the opportunity for Aboriginal persons to withhold their details from being forwarded to these parties.

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

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 study area and proposed development was provided to RAPs as part of the registration of interest process detailed in Section 3.1.3. Basic information on the proponent and proposed development was included in the EOI letter mailed on 15 June 2018. In addition, an information session was held, open to all RAPs, on Friday 10 August 2018 at the Maxwell Infrastructure site office.

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 on the proposed study area to be determined; and

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

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

- a request with the draft assessment methodology for any initial comments regarding the Aboriginal cultural heritage values of the study area;
- a request during the information session held on Friday 10 August 2018 for any information regarding the Aboriginal cultural heritage values of the study area;
- discussion of cultural heritage values during fieldwork;
- offers made to RAPs for private interviews, in case the information is considered culturally sensitive;
- provision of the draft report to all RAPs for comment prior to finalisation; and
- invitation to all RAPs to attend an ACHAR discussion session following the provision of the draft ACHA.

Existing publicly available information from previous studies in the study area (as well as surrounding project sites) was also reviewed for information on cultural heritage. This included review of *Aboriginal Archaeological and Cultural Heritage Impact Assessment* (AECOM 2012, 2015) for the Drayton South Coal Project, which assessed a very similar area to the current 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 methodology for the cultural heritage assessment to RAPs and that RAPs be given a minimum of 28 days to review and provide feedback on this methodology (Appendix H).

All RAPs for the current assessment were provided by mail with a draft of AECOM's proposed assessment methodology on 19 July 2018. RAPs were given a minimum of 28 days to review and provide feedback on this methodology with the closing date for comments on 21 August 2018.

Six responses were received from RAPs relating to the draft methodology. No specific cultural heritage values relating to the study area were identified by RAP respondents. RAP responses are summarised in Table 2, with written responses attached as Appendix I.

Table 2 RAP responses to draft methodology

Registered Aboriginal Party	Date	Method	Summary of response	Response
AGA Services	27-July-18	Email	Agree with the methodology	None required
Cacatua	27-July-18	Email	Agree with the methodology	None required
Wallagan Cultural Services	27-July-18	Email	Agree with the methodology	None required
Widescope	8-August-18	Email	Agree with the methodology	None required
Wonn1	16-August-18	Email	Agree with the methodology	None required

Registered Aboriginal Party	Date	Method	Summary of response	Response
Tocomwall Pty Ltd/ Scott Franks and Anor on behalf of the PCWP	25-July-18	Email	Does not support the methodology. Indicated belief that the mine is located on the Spur Hill Mining Lease Application (MLA) and AECOM has not considered documents associated with that Project. Also, expressed concern that RAPs not authorised to make comments, recommendations or support the destruction of any area within the Registered Native title area of the PCWP.	Malabar personnel met with Scott Franks to clarify that the Maxwell study area is not located on the Spur Hill MLA. Offer made for cultural interviews as part of draft ACHAR review to address concerns

3.3.2 Archaeological Survey

The following RAPs participated in the fieldwork component of this ACHAR:

Table 3 RAP field representatives by organisation

Registered Aboriginal Party	Field representative(s)
DNC	Paul Boyd
WLALC	Jamie-Lee
Wallagan Cultural Services	Maree Waugh
Culturally Aware	Tracey Skene
Wattaka Wonnarua Cultural Consultancy Services	Luke Hickey
Ungooroo Aboriginal Corporation	Allen Paget
AGA Services	Greg Sampson
Cacatua	George Sampson
Hunter Valley Aboriginal Corporation	Clifford Sampson
Murra Bidgee Mullangari	Ryan Johnson
Ungooroo culture & community service	Jade Jones
Gidawaa Walang Cultural Heritage Consultancy	Craig Horne
Yinarr Cultural Services	Kathie Steward Kinchela
Merrigarn	Beau Mason
Muragadi	Duane Sharpley
Wailwan Aboriginal Digging Group	Phil Boney
Widescope	Steven Hickey
Gomeroy Cultural Consultants	Dave Horten
Aliera French Trading	Barry French

RAP field representatives involved in the field survey identified the following cultural values for the study area and surrounds in conversation with AECOM archaeologists:

- Mount Arthur is the dominant landscape feature in the local area and is a culturally significant landmark for Aboriginal people. Views of Mount Arthur are available from multiple viewpoints within the study area;
- an Aboriginal massacre site is located south of Mount Arthur (outside the study area) and is an important cultural historical site;
- the area south of Mount Arthur may have formed a bastion for dispossessed Aboriginal people during the contact period;
- an Aboriginal massacre site is located west of the study area near the Golden Highway (further information was requested about this matter, but was not provided);
- Mount Arthur burial is an important cultural site located north of the study area;
- Aboriginal people are known to have been employed on farms in the greater Jerrys Plains/Edderton area;
- the Hunter River gravels will have formed an important resource for Aboriginal people occupying the study area and its environs;
- the identification of long use-life tools during the current survey (i.e., axes) indicates that parts of the study area were likely to have been intensively occupied in the past;
- land within the study area, including identified sites, forms part of a much larger cultural landscape for the Wonnarua people;
- Saddlers Creek was likely a focal resource point for Aboriginal people occupying the greater Jerrys Plains/ Edderton area; and
- prior to European settlement, the native vegetation communities of the study area would have contained a variety of edible and otherwise useful plant species.

3.4 Stage 4 - Review of Draft Assessment Report

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

In accordance with Section 4.4.2 of the Consultation Requirements, all RAPs were sent a draft of this ACHAR on 18 November 2018 for review and comment (either by email or mail). A management meeting was held at the Maxwell Infrastructure site offices on 5 December 2018 with all RAPs invited to attend. The purpose of the management meeting was to discuss the findings of the assessment and proposed management recommendations. On 19 December 2018 attempts were made to phone all RAPs who had not provided comment. RAP responses are summarised in Table 4 with written and verbal responses attached as Appendix I.

A total of 12 responses were received supporting the assessment and management recommendations, one response not in support, three responses with no comment and 11 RAPs did not respond.

Table 4 RAP responses to draft ACHAR

Registered Aboriginal Party	Date	Method	Summary of response	AECOM response
Tocomwall Pty Ltd/ Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People (PCWP)	18-Nov-18	Email	Tocomwall responded with the following (18/11/18): *Tocomwall and the PCWP registered native title claimant group rejects the ACHAR. After a quick review of the document it appears that you or the proponent has not considered the finding against this mining lease before it was purchased by Maxwell. The PAC rejected the*	AECOM responded (21/12/18) with a letter requesting relevant cultural values be provided for the AHCAR as well

Registered Aboriginal Party	Date	Method	Summary of response	AECOM response
			original heritage assessment conducted by AECOM and supported the confidential assessment conducted by Tocomwall and the upper hunters breeders association. As this document is controlled by The upper hunters Breeders association and Tocomwall, I will not be making that available to AECOM or your proponent *Tocomwall responded (21/12/18) stating that they do not give licence and consent to RAPs assessing or making comment on the cultural values with in the registered native title clamed area. In addition, Tocomwall noted that several site cards have been lodged with AHIMS one of which covers the Maxwell Mining operations ELA*. Furthermore, Tocomwall stated: *Malabar has been involved in a section 29 notification under native title it is ridiculous for this company to now try and refuse to except who and which group is a traditional knowledge holder as described in the 2010 CCGL for proponents*	as a request to meet to discuss the PCWP's concerns with the ACHAR. The response also noted the PAC findings relevant to the Drayton South Assessment. Tocomwall declined to meet.
Murra Bidgee Mullangari (Ryan Johnson)	26-Nov-18	Email	Supports the assessment and recommendations	None required
Gidawaa Walang Cultural Heritage Consultancy (Craig Horne)	28-Nov-18	Email	Read the draft and have no comments to add	None required
DNC	19-Dec-18	Email	Supports the assessment and recommendations	None required
Margaret Mathews	19-Dec-18	Phone	Hadn't yet reviewed the report. AECOM explained the findings and management recommendations. Margaret said she was happy with the recommendations	None required
Deidre Perkins	19-Dec-18	Phone	Supports the assessment and recommendations	None required
ELM Corp	19-Dec-18	n/a	No answer to phone call. No response to follow-up email	AECOM sent follow up email to ELM
Wattaka Wonnarua Cultural Consultancy Services	19-Dec-18	n/a	No answer to phone call. No response to follow-up email	AECOM sent follow up email
Ungooroo Aboriginal Corporation	19-Dec-18	Phone	Spoke with Melanie at Ungooroo Aboriginal Corporation who will request a response from Allen Paget. No response provided	None required
Lower Hunter Wonnarua Cultural Services (Tom Miller)	19-Dec-18	n/a	No answer to phone call. No response to follow-up email	AECOM sent follow up email
Ungooroo culture & community service (Rhonda Ward)	19-Dec-18	Email	No comment on the ACHAR	None required

Registered Aboriginal Party	Date	Method	Summary of response	AECOM response
Yinarr Cultural Services	19-Dec-18	n/a	No answer to phone call. No response to follow-up email	AECOM sent follow up email
Merrigarn	19-Dec-18	n/a	No answer to phone call. No response to follow-up email	AECOM sent follow up email
Muragadi	19-Dec-18	n/a	Phone disconnected. No response to follow-up email	AECOM sent follow up email
A1 Indigenous Services (Carolyn Hickey)	19-Dec-18	Phone	Hadn't yet reviewed the report. Committed to reviewing. No comments provided.	None required
Widescope (Steven Hickey)	19-Dec-18	Phone	Supports the assessment and recommendations	None required
Kauwul Wonn1 (Arthur Fletcher)	19-Dec-18	Phone	Stated hasn't reviewed the report. Requested report is emailed again. No response received to follow up email	AECOM resent the report
Gomeroy Cultural Consultants (Dave Horton)	19-Dec-18	Phone	Stated hasn't received the report. AECOM explained the findings and management recommendations. Mr Horton said he was happy with the recommendations. Requested a hard copy of the report	AECOM sent a hard copy of the report.
Culturally Aware (Tracey Skene)	20-Dec-18	Email	Stated satisfaction with the mitigation recommendations in the report. Requested to be kept updated on assessment progress and that community is involved in developing the management plan with a focus on developing management for individual sites at risk of erosion and cracking. Noted that the cultural landscape is of high importance to Aboriginal people	None required
Amanda Hickey Cultural Services	20-Dec-18	Email	Satisfaction with the draft report	None required
Wallagan Cultural Services (Maree Waugh)	20-Dec-18	Phone	Supports the assessment and recommendations	None required
AGA Services	20-Dec-18	Email	Supports the assessment and recommendations	None required
Cacatua	20-Dec-18	Email	Supports the assessment and recommendations	None required
Hunter Valley Aboriginal Corporation (Ross Pahuru)	20-Dec-18	Phone	Ross called and stated he no longer worked for HVAC and to contact HVAC directly. No response to follow-up email	AECOM sent follow up email to HVAC
WLALC (Noel Downs)	19-Dec-18	Phone	Hadn't yet reviewed the report (19/12/18). Requested a reminder email. Called to say WLALC will not provide a response until late January 2019 (21/12/18). No further comments provided	AECOM sent a reminder email
Wailan Aboriginal Digging Group	20-Dec-18	Email	No comments on the report	None required
Aliera French Trading	24-Jan-19	Email	Satisfied with the report	None required

4.0 Landscape Context

This section reviews the landscape context of the 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 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, economic[2] 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

The study area for this assessment includes three spatially discrete parcels of land encompassing the proposed underground mining area, inclusive of a potential impact zone buffer, as well as land required for surface infrastructure (i.e., transport and services corridor, Edderton Road realignment, stockpile expansion, etc.)(Figure 2). Combined, these areas produce a study area of approximately 2,330 ha that extends south of the existing Maxwell Infrastructure as a thin transport and services corridor, expanding to a roughly circular area south of Saddlers Creek and north of the Hunter River. The majority of land within the study area has historically, been used 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.

4.2 Topography

The study area is located approximately 10 km south-southwest 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 gently inclined on alluvial flats that generally border Saddlers and Saltwater Creeks, to steeper slopes on hills in the central and southern portions of the study area.

Elevations across the study area range from approximately 110 metres (m) Australian Height Datum (AHD) to 270 m AHD, providing a total local relief of 160 m (Figure 4). Following Speight (2009), a breakdown of the relative representation of morphological landform units within the study area is provided in Table 5. Identified landform units, meanwhile, are shown on Figure 5.

[2]i.e., edible and/or otherwise useful (e.g., medicine, clothing).

Table 5 Morphological landform units within the study area

Landform unit	Area (ha)	%
Disturbed	39.07	1.7
Lower	714.01	30.6
Middle	707.27	30.4
Upper	314.80	13.5
Crest	316.42	13.6
Flat	238.74	10.2
Total	2330.31	100

4.3 Hydrology

The study area is located within the Hunter River catchment, with the Hunter River located around 360 m from the study area's southern boundary. The Hunter River is the most significant watercourse in the Hunter Valley Region, and in the area near the study area generally flows in westerly direction through a channel approximately 30 m wide and approximately 3-6 m deep. The Hunter River cuts across a well-developed floodplain, which can be up to several kilometres wide at its widest point.

The principal watercourse associated with the study area is Saddlers Creek which is located on the northern boundary of the study area. This creek is 4th order 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 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 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 immediately upstream of the Hunter River and also located outside the study area. As with 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 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 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. Quaternary alluvial deposits are associated with Saddlers and Saltwater Creeks, and the Hunter River, 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 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 nearby the 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 (1998) 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 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 study area form part of the Brays Hill, Bayswater and Liddell soil landscapes. The Brays Hill soil landscape is characterised by red clays (*Vertosol*) 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. 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. Lower-slopes are comprised of Yellow Solodic Soils, which consist of weakly structured dark brown loam A_1 horizons over bleached orange clay loam A_2 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 Bondaian 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 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 rilling and gullying of the underlying B unit.

As in other parts of the Hunter Valley, existing archaeological, environmental and historic reference materials for the 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.

Figure 4 Elevation Profile

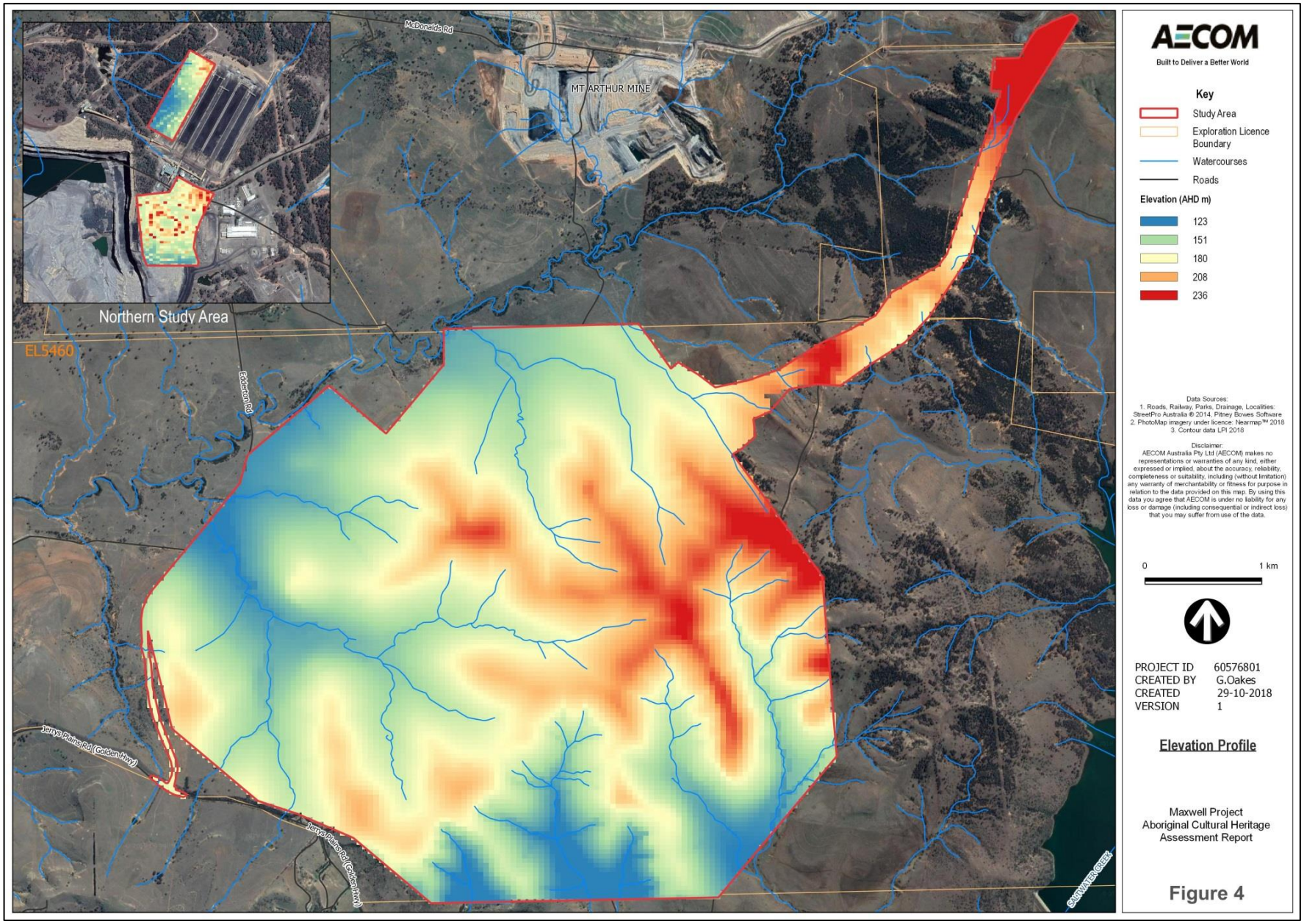


Figure 5 Landform & Hydrology

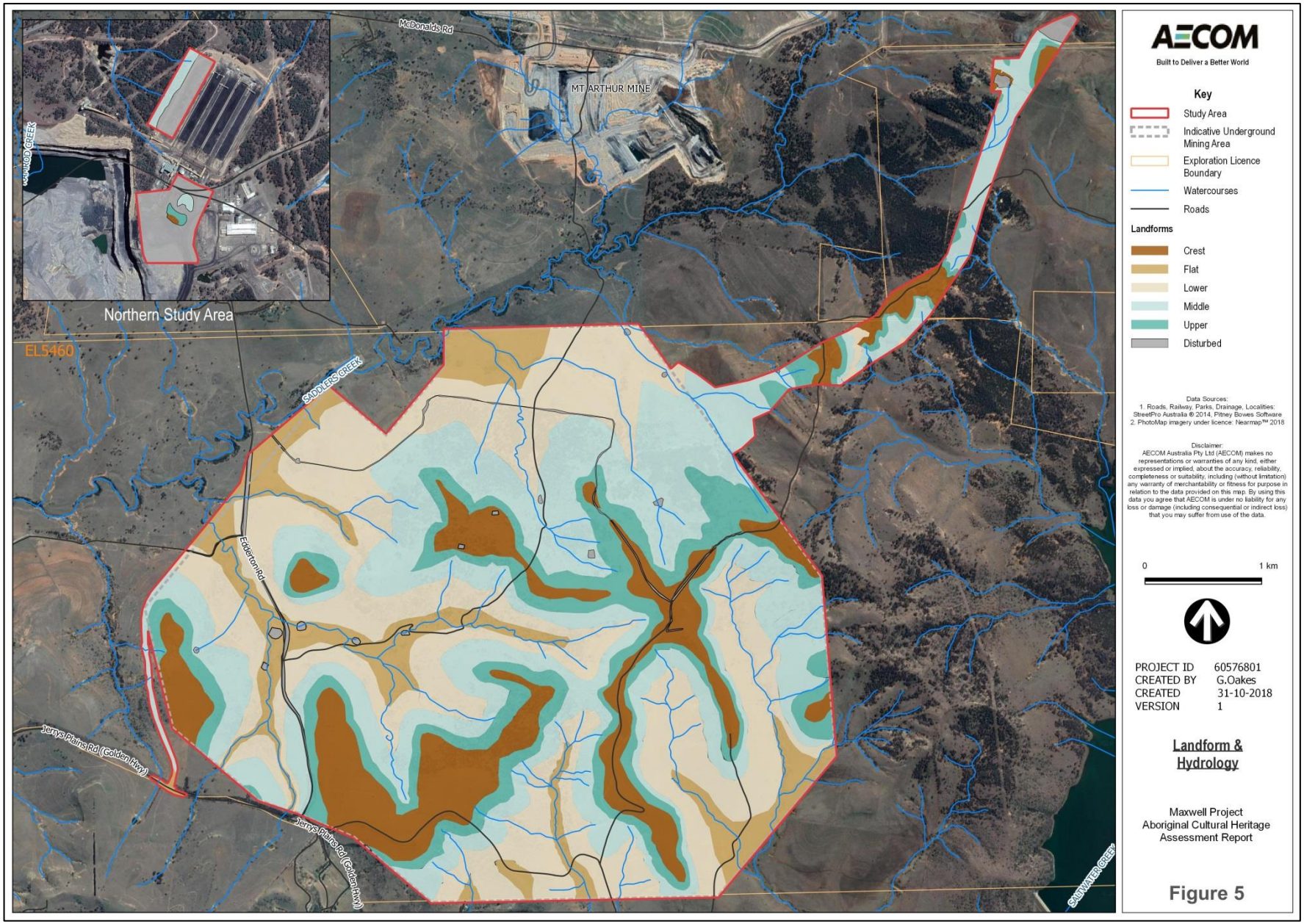


Figure 6 Surface Geology

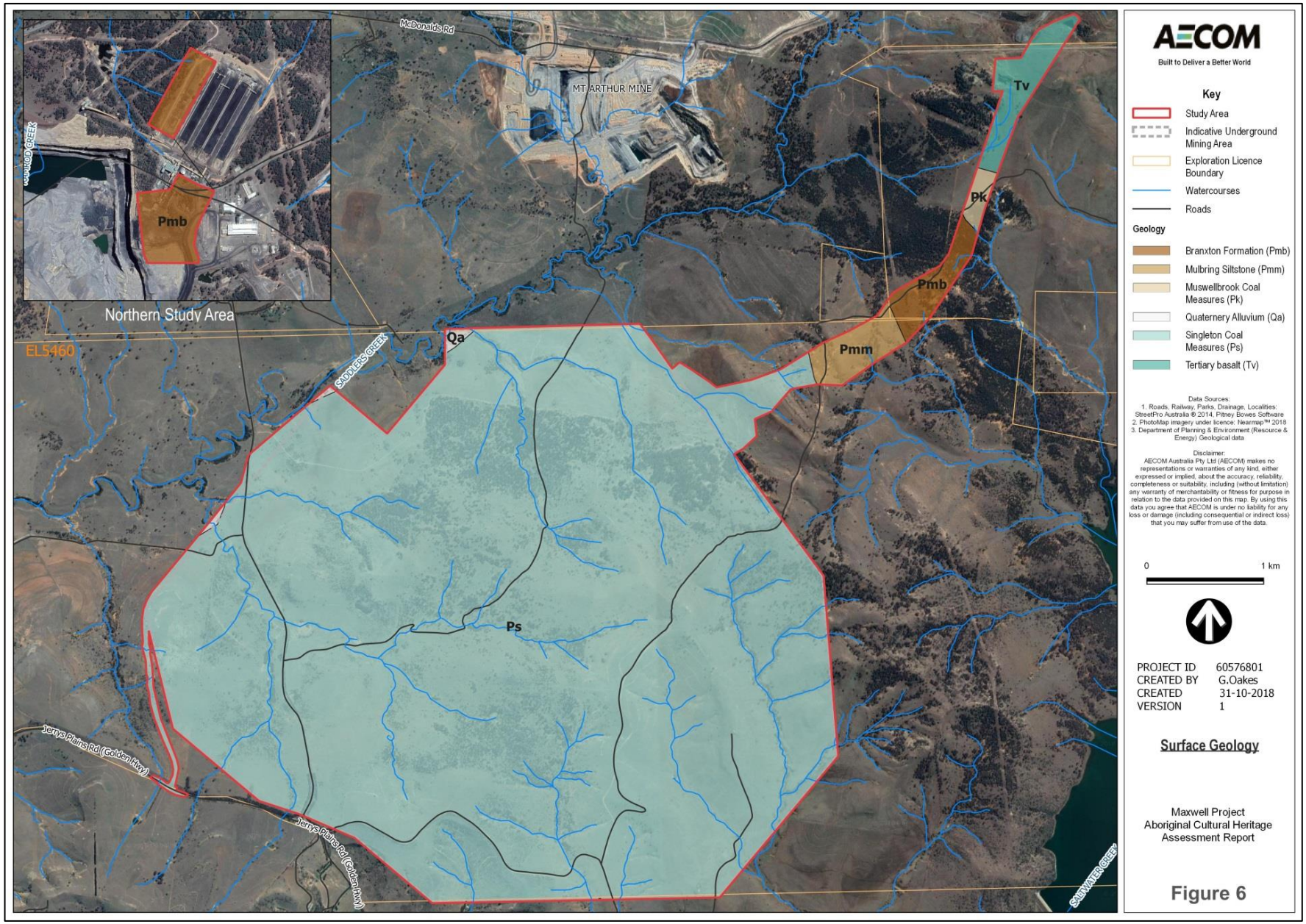
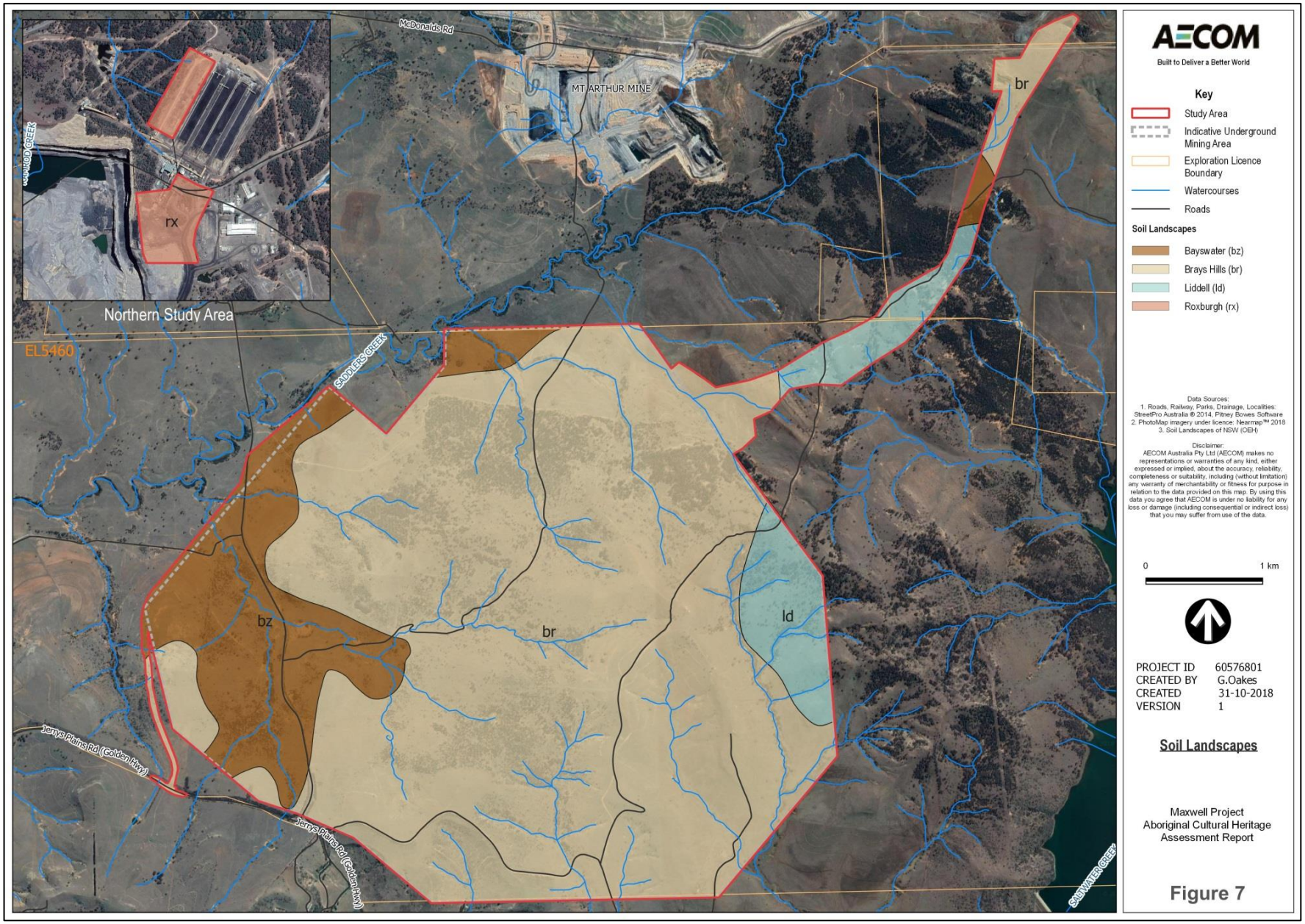


Figure 7 Soil Landscapes



4.6 Flora & Fauna

Native vegetation within the 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 study area supports a diverse range of natural vegetation communities, with different communities occupying different landscape positions.

Current vegetation across the 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 Project indicates that Dry Sclerophyll Forest in the 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 study area. Forested Wetland comprising Swamp Oak Forest is also mapped in small patches in the western portion of the study area.

Native derived grassland in the 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 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 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 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 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 economic 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 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.

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 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 study area. Examination of aerial photographs from 1958 (Figure 8), 1967 (Figure 9), 1974 (Figure 10), 1989 (Figure 11), 1998 (Figure 12), and 2009 (Figure 13), 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;
- construction of essential services including power lines and roads (e.g., Edderton Road); 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 14. 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.

Figure 8 1958 aerial photograph of the study area (Source: Land & Property Information NSW)



Figure 9 1967 aerial photograph of the study area (Source: Land & Property Information NSW)

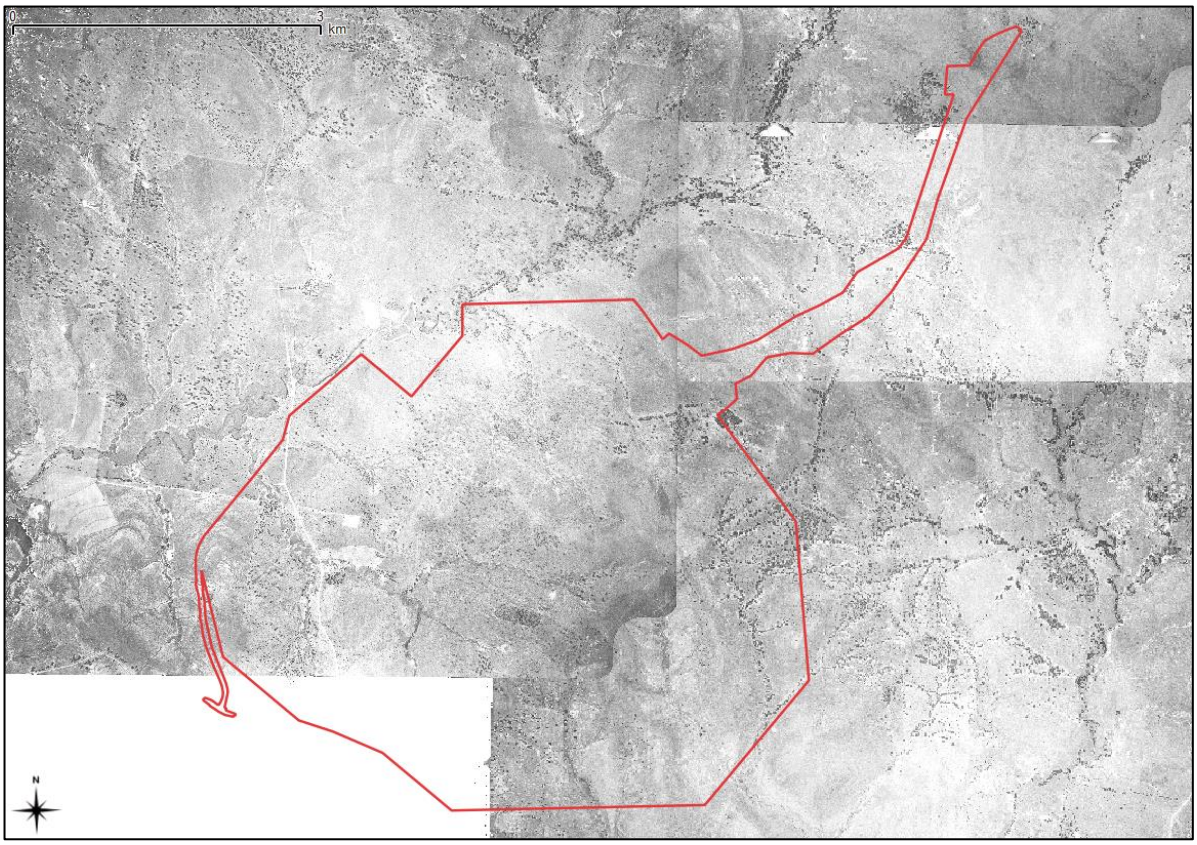


Figure 10 1974 aerial photograph of the study area (Source: Land & Property Information NSW)

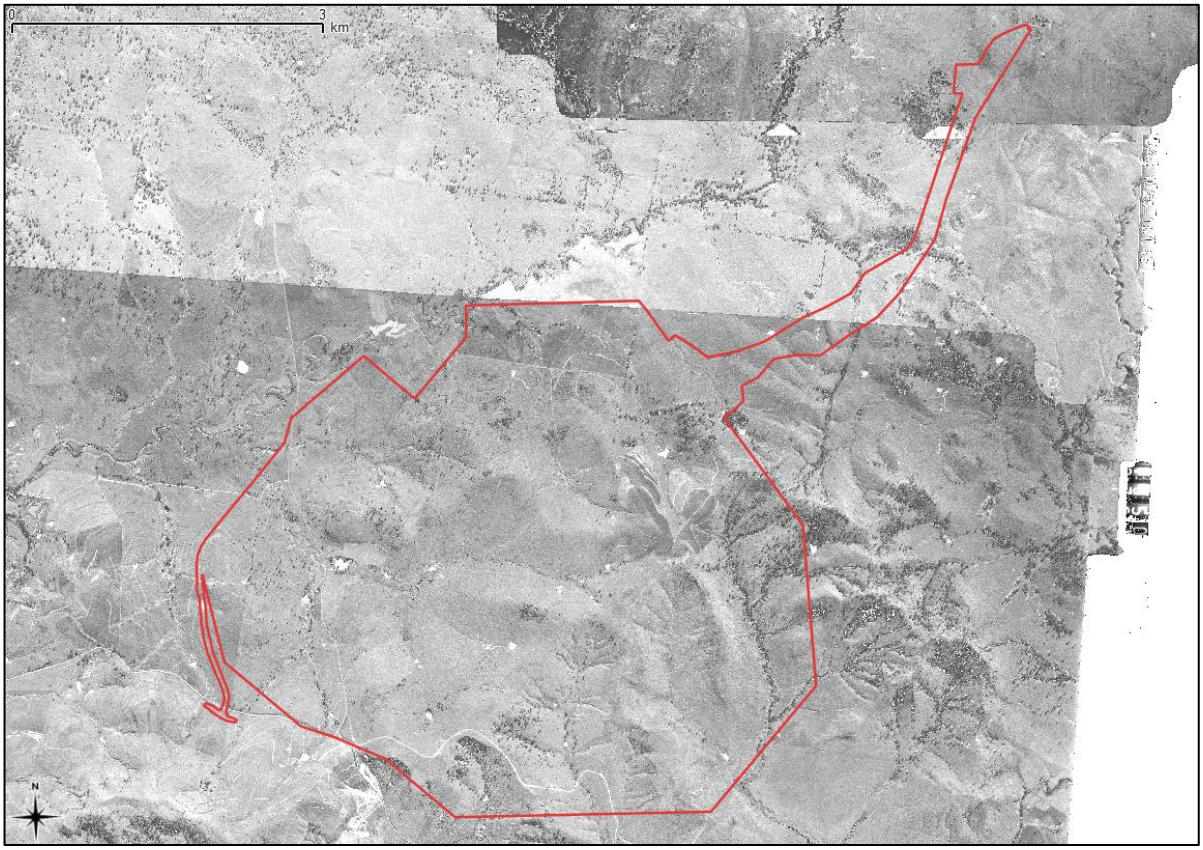


Figure 11 1989 aerial photograph of the study area (Source: Land & Property Information NSW)

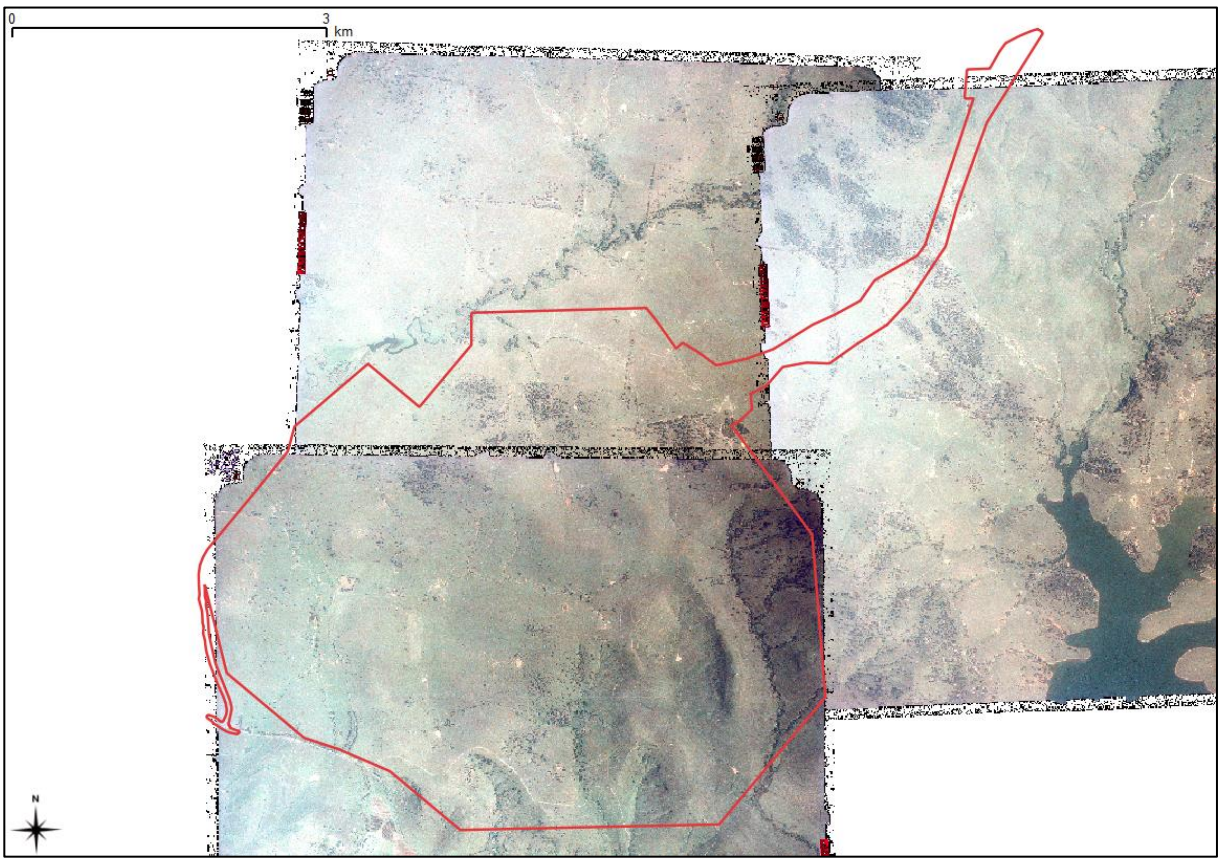


Figure 12 1998 aerial photograph of the study area (Source: Land & Property Information NSW)

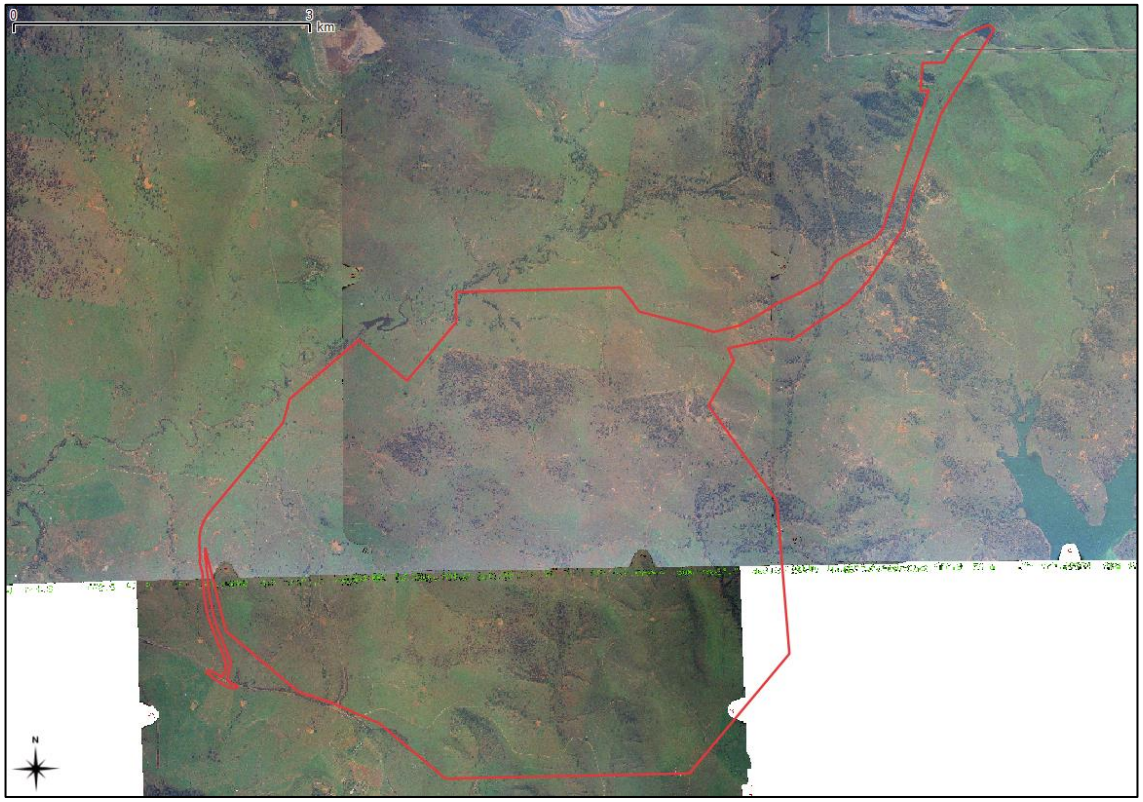


Figure 13 2009 aerial photograph of the study area (Source: Land & Property Information NSW)

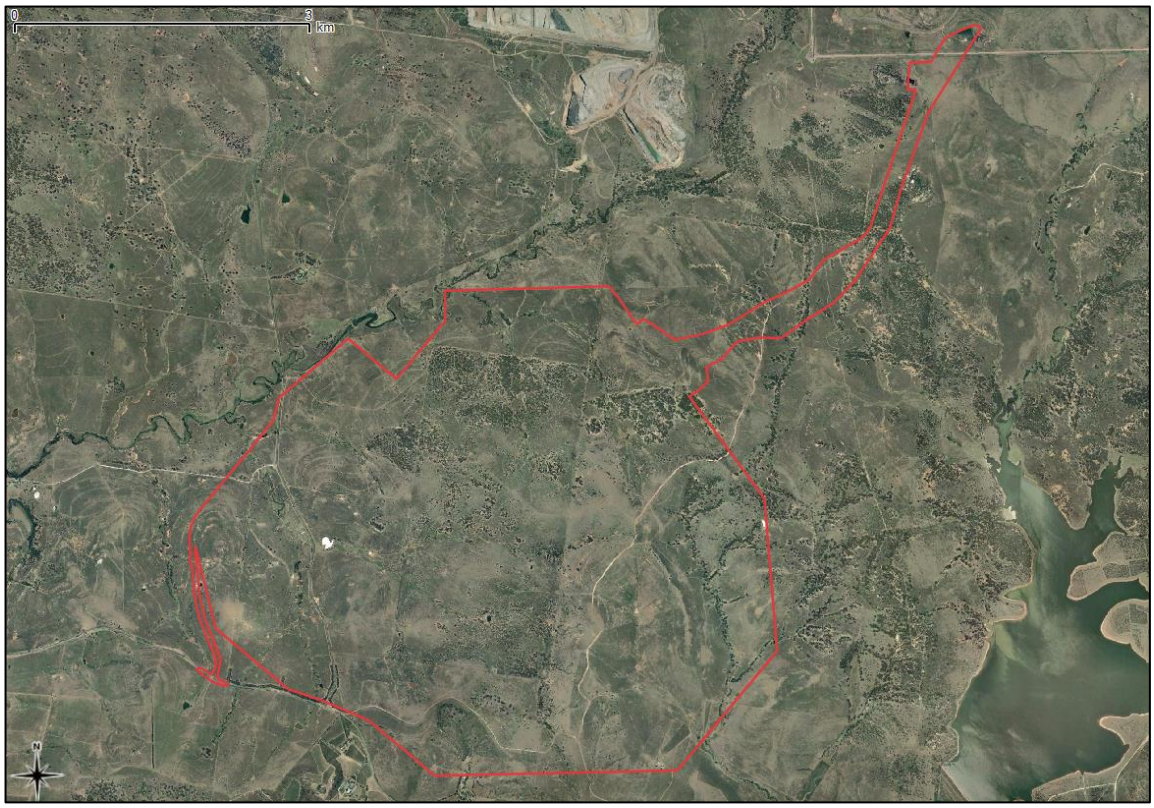
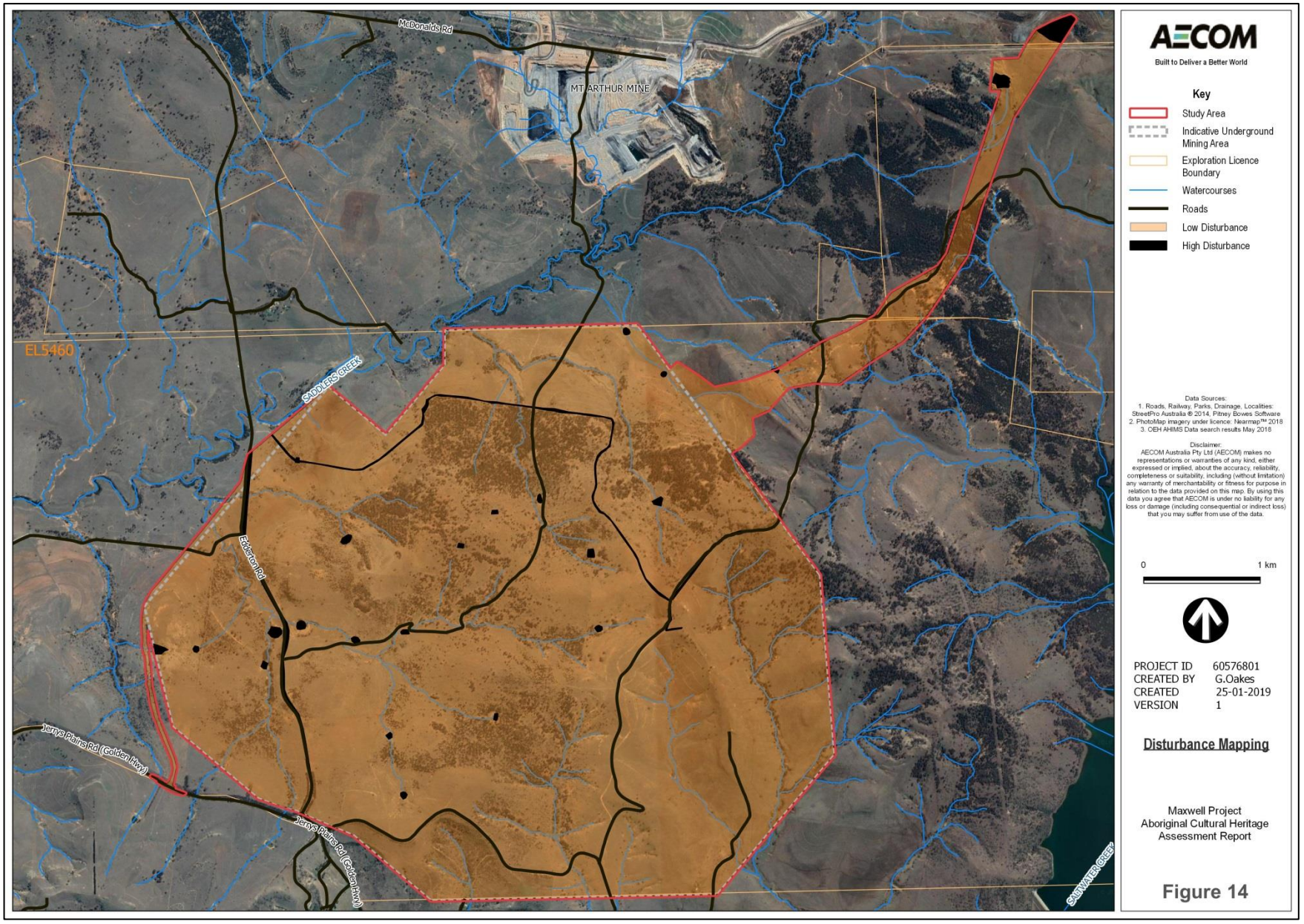


Figure 14 Disturbance Mapping



4.9 Key Observations

Key observations to be drawn from a review of the existing environment of the study area are as follows:

- The topography of the study area consists principally of flats interspersed with low undulating to steeply sloping hills, ridges and crests over open farmland which is typical of the region. Slopes range from level and gently inclined on alluvial flats that border both Saddlers and Saltwater Creeks to steeper slopes on hills in the central and southern portions of the study area.
- The principal watercourse associated with the study area is Saddlers Creek, a 5th order creekline located outside the study area on its northern boundary. While not located within the study area, Saddlers Creek is fed by a number of small ephemeral creeks and drainage lines that traverse its central and northern portions. These creeks and drainage lines form complex drainage networks that comprise the central reaches of the Saddlers Creek catchment area.
- Reference to the Singleton 1:250,000 geological mapsheet indicates that the surface geology of the 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 study area and are likely to have had a direct bearing on the nature and composition of Aboriginal stone assemblages within it: the Hunter River Gravels, and two identified sources of silcrete cobbles, one within the study area and another 2.7 km to the west.
- Prior to European settlement, the floral and faunal resources of the study area and environs will have been sufficient to facilitate intensive and/or repeated occupation by Aboriginal people.
- Examination of historical aerial imagery for the 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 study area retains moderate integrity.

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 study area on both a regional and local scale. This section builds on this foundation by summarising relevant ethnohistoric information for the study area and environs. Further information is also provided in the CVR (Appendix A).

As in other parts of New South Wales 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 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 (km^2) 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 km^2 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 km^2 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 km^2 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 1826[3] (the 'Bahtahbah' mission) and is widely regarded as one of the pioneers of Aboriginal studies in New South Wales 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 15 Excerpt from Tindale's (1974) tribal map (Tindale, 1974)

[3] Subsequently relocated to Toronto in 1831and 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.

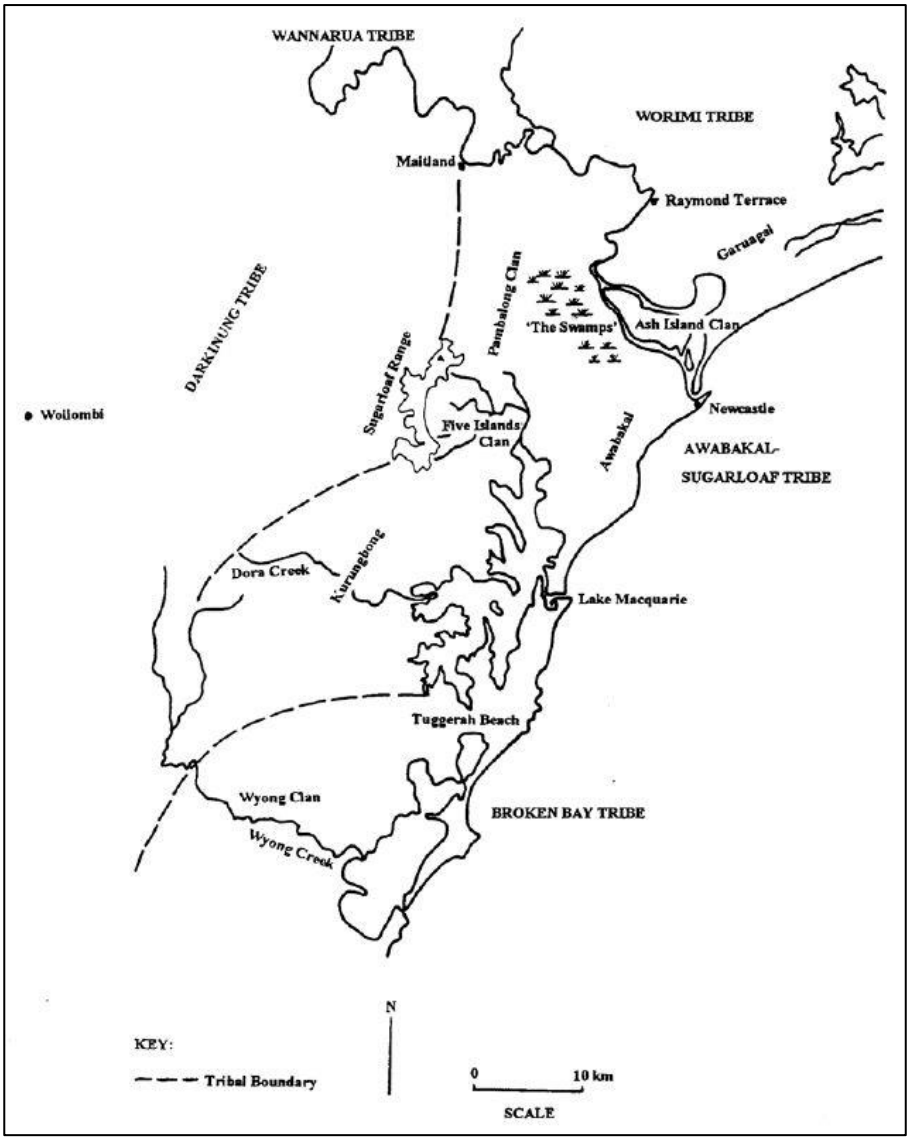


Figure 16 Gunson's (1974) tribal map for the lower Hunter Valley, based on the observations of Reverend Lancelot Threlkeld (from Kuskie, 2012: 39, Fig. 8, after Gunson, 1974)

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 range[4]. 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 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 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 (Appendix A).

[4] From north to south: the Sugarloaf Range, the Watagan Range and Peats Ridge.

5.2 Social Organisation

In common with other regions of New South Wales (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 clan[5], 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.

[5] 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, Dyall'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)[6]. 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.

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 two[7] 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 "prepatrory [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 is 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).

[6] 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.
[7] Where two circles were used, these were separated by a distance of up to 400 m.

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 Macquarie[8], 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*.

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).

[8] 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.*

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 New South Wales 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. This 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 hectare) 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 hectares) (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 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 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

Formal archaeological interest in the Aboriginal archaeological record of the Hunter Valley can be traced to the late 1930s, with the then Curator of Anthropology at the Australian Museum Fred McCarthy undertaking an archaeological reconnaissance of the Valley in 1939 (Moore 1970: 29). McCarthy's subsequent investigation, with F.A. Davidson, of an extensive open artefact site on a terrace of the Hunter River at Gowrie, near Singleton, is widely regarded as the first serious archaeological study of stone artefacts in the Hunter Valley proper (McCarthy & Davidson 1943). MCarthy's early endeavours aside, more detailed investigation of the Valley's Aboriginal archaeological record did not begin until the mid-to-late 1960s, a period that witnessed a series of archaeological surveys and site excavations completed as part of the Australian Museum's long term and wide ranging archaeological research project into the Aboriginal prehistory of the Hunter Valley (Moore 1969, 1970, 1981).

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 hundreds, if not thousands, of Aboriginal archaeological investigations involving survey and/or excavation having now been undertaken, the majority as part of larger 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, with thousands of Aboriginal sites now registered on OEH's AHIMS database. Together with Dean-Jones and Mitchell's (1993) pioneering environmental study, existing syntheses of the Aboriginal archaeological record of the Hunter Valley (e.g., ERM 2004; Hughes 1984; Koettig 1990; MacDonald & Davidson 1998) provide a suitable interpretive framework for the current assessment. 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, open sites and open camp sites, are by far and away the most common and widely distributed form of Aboriginal archaeological site in the Hunter Valley (ERM 2004; Hughes 1984; MacDonald & Davidson 1998). 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 distribution, site structure and the technology of backed artefact manufacture, in particular, comprising key research topics (Baker 1992a, 1992b, 1992c; Hiscock 1986a, 1986b, 1993a; Koettig 1992, 1994; Moore 1997, 2000; White 1999, 2012).

As highlighted by Hughes (1984) and reiterated by numerous other researchers (e.g., ERM 2004; Koettig & Hughes 1983, 1985; Koettig 1992,1994; Kuskie 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 salvage projects (e.g., Koettig 1992, 1994; Kuskie & Clarke 2004; Kuskie 2000; MacDonald & Davidson 1998; OzArk 2013; Rich 1992; and 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[9] assemblages concentrated on elevated, low gradient landform elements adjacent to higher order streams.

In the Lower Hunter Valley, a similar pattern has been identified for the permanent to semi-permanent wetlands of the Hunter 'delta' (e.g., Kuskie 1994; Kuskie & Kamminga 2000). 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'.

Flaked stone artefacts dominate archaeological assemblages from recorded open artefact sites within the Hunter Valley (Hiscock 1986a), with heat fractured rock also well represented. Items such as complete and fragmentary grindstones, hammerstones, edge-ground hatchet-heads, ochre and shell have also been identified though comparatively infrequently. With the notable exception of 'knapping floors', a relatively common component of the open artefact site record of the Hunter Valley, associated archaeological features (e.g., hearths and heat treatment pits) have likewise proven elusive (for examples see Koettig 1992; Kuskie & Kamminga 2000).

Defined in slightly different ways by different researchers, knapping floors can be broadly defined as spatially-discrete activity areas in which primacy was given to the reduction of one or more stone packages (White 1999:152). Recorded knapping floors in the Hunter Valley vary considerably in size and complexity, with some of the largest and most complex examples identified through excavation as opposed to survey. 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 floor 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 1986a; 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, colluvial/fluvial aggradation and aeolian transportation 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 visibility and distribution of open artefact sites within the region are, for the most part, 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 invariably 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.

Such evidence has posed a significant analytical and interpretive dilemma for archaeologists working in the Hunter Valley. Defining sites on the basis of surface artefacts alone is clearly problematic, with modern site boundaries frequently reflecting the size and distribution of surface exposures as opposed to the actions of Aboriginal people in the past. Nonetheless, for pragmatic reasons, this has been the most commonly used approach, with 'distance' and 'density-based' definitions dominating. In the Hunter Valley, 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*'.

[9] Those containing a wider variety of raw materials and technological types and/or higher mean artefact densities and features such as knapping floors and hearths.

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'.

While not widely employed, Kuskie's (1994, 2000a) system of open artefact site definition, developed for use in the Hunter Valley and other surrounding regions, is also worthy of note here. In short, this system is predicated on the definition of 'survey areas' within broader 'Archaeological Terrain Units' (ATUs), with the latter comprising discrete, recurring areas of land defined on the basis of landform element and slope class, and the former, an area of a single ATU bounded on all sides by different ATUs (Kuskie 2000: 65-67).

Within this overarching environmental scheme, open artefact sites are defined by the presence of one or more stone artefacts within a survey area, with site boundaries corresponding with the boundaries of the broader survey area irrespective of the visible extent of artefacts within it. Spatially discrete occurrences of stone artefacts within a given site boundary are referred to as 'loci' (Kuskie 2000: 65-66).

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 pre-eminent role in archaeological reconstructions of past Aboriginal land use in the region. To date, hundreds, if not thousands, of surface-collected and excavated chipped stone assemblages from the Hunter 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, in some instances, 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), 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 the first appearance, in the mid- Holocene[10], of a new suite of chipped 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, 2014). 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 southeastern 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.

[10] Note that more recent research into the chronology of backed artefacts and points in Australia (e.g., Hiscock & Attenbrow, 1998, 2004; Hiscock, 1993b) has demonstrated a long history of production and use for these implement types, with both now known to have been produced in the early Holocene and likely in the late Pleistocene as well.

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.

Table 6 McCarthy's Eastern Regional Sequence (ERS) of stone artefact assemblages

Current phasing	McCarthy's (1967) Phasing	Approximate date range	Backed artefact frequency	Bipolar artefacts	Edge-ground hatchet heads
Pre-Bondaian	Capertian	40,000-8,000 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 occupying 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 and colluvial gravel deposits[11] associated with the Hunter River and its tributaries (Raggatt 1938; see also Hiscock 1986a:14-16). Widely distributed and easily accessible, it would appear that these deposits functioned as the primary source of lithic raw materials for Aboriginal flaked stone tool manufacture in the Hunter Valley proper.

In the Hunter Valley, asymmetrical and symmetrical backed artefacts dominate the retouched components of surface collected/recorded and excavated flaked stone assemblages. 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 (Figure 17). 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 alternation of indurated mudstone blanks is rare (e.g., Koettig 1992) and likely reflects the generally higher 'raw' flaking quality of this material.

[11] i.e., active point and mid-channel gravel bars, as well as elevated terrace and palaeochannel remnants.

Alongside the reconstruction of backed artefact manufacturing processes, the identification of diachronic change in Bondaian lithic technology in the Hunter Valley has also received considerable analytical and interpretive attention (e.g., Baker 1992c; Haglund 1989; Hiscock 1986a, 1986b). Hiscock's (1986a) pioneering attribute analysis of a sample of unretouched mudstone flakes recovered from the Sandy Hollow 1 rockshelter excavated by Moore (1970) is of particular significance in this regard and can be regarded as the foundation upon which subsequent studies have been carried out. This analysis sought to test a tripartite division of the Sandy Hollow 1 (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. Attribute analysis of a sample of 742 complete mudstone flakes from Square AA 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 (see Table 7).

Table 7 Hiscock's 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	• 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	• 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	• 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

Having established the validity of the three phase Bondaian sequence at SH1, 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. On this basis, Hiscock (1986b) proposed that the attribute analysis employed at SH1 could serve as a relative dating system for open sites in the Hunter Valley. Given the number 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 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, variability itself linked to variables such as raw material type and accessibility, site function and stylistic differences between Aboriginal groups.

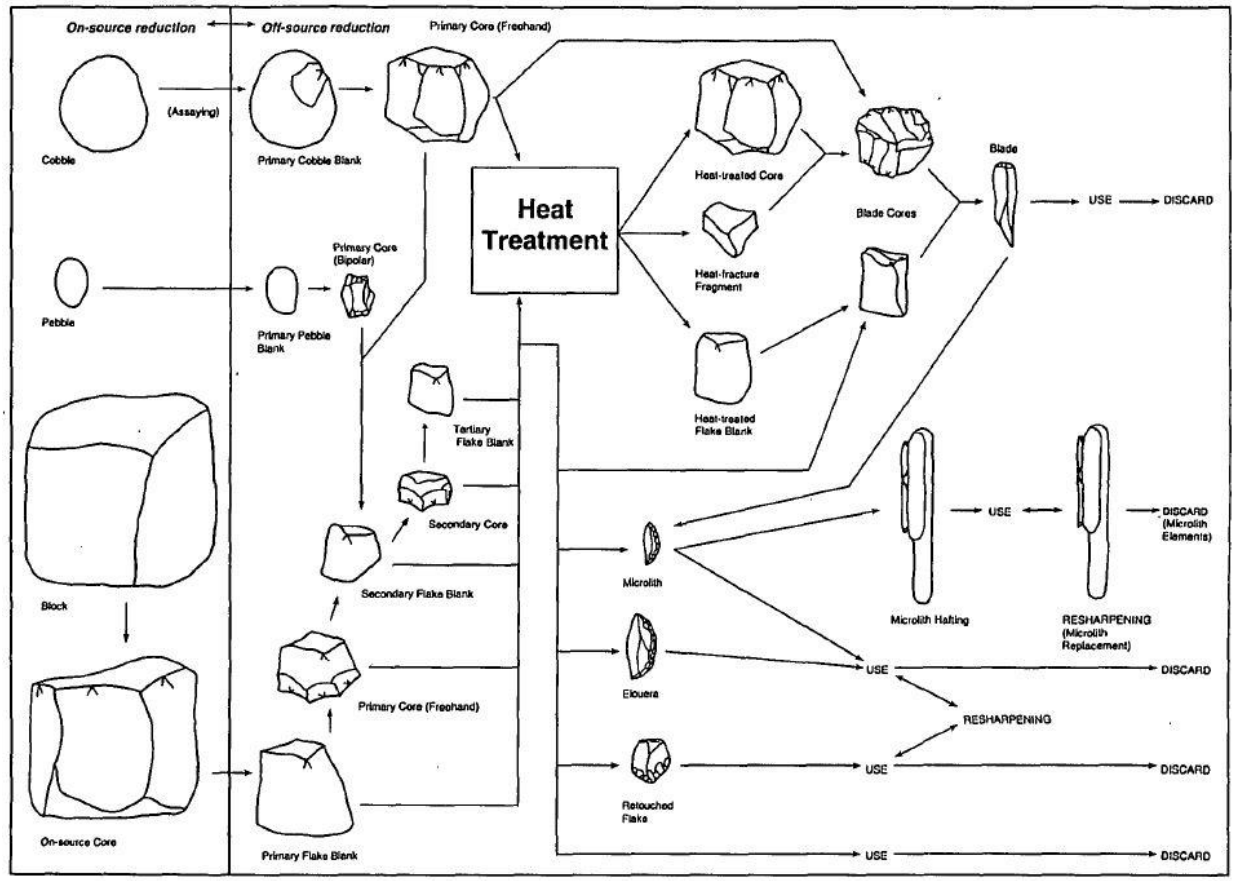


Figure 17 Moore's (2000) reduction model for the technology of Hunter Valley microlith assemblage (from Moore 2000: 29, Fig. 5)

6.1.4 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, for example, 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 m^2 section of large gravel bar (80 m wide and 1.5 km long) at the mouth of the Goulburn River near Denman.

6.1.5 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 (in prep.) 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 profiles[12], 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 lines[13]. 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 6). 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).

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).

6.1.6 Occupation models

A number of Aboriginal occupation models have been proposed for the Hunter Valley over the past three decades, with existing models based on varying combinations of archaeological, environmental and ethnohistoric data. Key models for the Central and Lower Hunter Valley include those developed by Haglund (1992), Koettig (1992, 1994), Kuskie (2000) and Kuskie and Kamminga (2000). These models are summarised in Table 8.

[12] 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.

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

Table 8 Aboriginal occupation models for the Hunter Valley

Researcher(s)	Year(s)	Project(s)	Area to which the model applies	Summary of model	Reference(s)
Koettig	1992 & 1994	Salvage of sites within the Camberwell and Bulga Coal Mine Leases	Central lowlands	• Repeated occupation of an area is likely to be represented by continuous, or near continuous, distributions of archaeological sites and/or features; • Sporadic or less intensive occupation of an area is likely to be represented by non-continuous or more widely dispersed archaeological sites and/or features; • Continuous to near- continuous distributions of archaeological evidence along watercourses suggest that Aboriginal people did not camp at specific locations; • Frequency of occupation at a given location is likely to have been related to the availability of subsistence resources (e.g., food, water, lithic raw materials); • Some locations may have been foci for Aboriginal occupation owing to the presence of particular resources (e.g., sandstone exposures suitable for grinding hatchet-heads); and • The duration of occupation at a given location may be evidenced by levels of disturbance to associated archaeological deposits, with sites occupied for shorter duration potentially having more intact deposits, as the length of stay may have been insufficient to disperse artefacts or mask the original form of knapping floors.	Koettig 1992, 1994
Haglund	1992	Salvage of sites along Doctors Creek, Warkworth	Doctors Creek area, Central Hunter Valley	• Kangaroos, wallabies, and other large and small game would have been abundant in the area during dry periods, and would have been hunted by small hunting parties of men who would prepare and repair their hunting equipment in close proximity to watercourses; • Larger family groups likely visited the area during wetter periods when watercourses would be flowing more reliably and moisture dependent plants occurred in greater abundance; • Women and children would procure and process plant foods, such as ferns, yams and other tubers, in the vicinity of creeks and watercourses; • Sporadic visits would have resulted in debris left behind being incorporated into the turf or buried by leaf litter and Casuarina needles more quickly than more intensive, long term visits; and	Haglund 1992

Researcher(s)	Year(s)	Project(s)	Area to which the model applies	Summary of model	Reference(s)
				• While some equipment such as grindstones may have been retained and carried throughout the landscape, flakes and other implements were likely manufactured, utilised and discarded on an “as needed” basis.	
Kuskie	2000	Archaeological survey of Mount Arthur North Coal Mine Lease	Mount Arthur Area, Central Hunter Valley	• The area has been occupied for at least the past 5,000 years; • Occupation may extend as far back as 30,000 - 40,000 years; • The area has predominantly been occupied by tribes of the Wonnarua language group, although members of neighbouring groups may also have sporadically visited and occupied the area. • The Mount Arthur North area was likely utilised and occupied by Aboriginal people at varying intensities on a seasonal basis; • Occupation was most intensive within 50m of the main watercourses (3rd and 4th order streams); • Aboriginal occupants had a strong preference for camping on level ground adjacent to reliable water sources and potentially more abundant subsistence resources; • Individual campsites were mainly occupied by single nuclear family groups and multiple family groups (bands); • Larger campsites from broader gatherings of people likely took place along the nearby Hunter River flats; • A greater range and frequency of activities were undertaken at camp sites, rather than in the surrounding landscape; • Camp sites along the major watercourses were occupied by small groups of people for varying lengths of time, during both the course of the seasonal round and in different years; • Occupation of camp sites throughout the entire Mount Arthur North area was predominantly sporadic rather than continuous; • Occupation, such as focussed camping, likely also occurred along level to very gentle drainage depressions (particularly 1st and 2nd order streams). These water sources were likely to be intermittent and occupation along these lower order streams may only have occurred when standing water was available; • Most camp sites involved overnight visits of small hunting parties rather than entire family groups;	Kuskie 2000

Researcher(s)	Year(s)	Project(s)	Area to which the model applies	Summary of model	Reference(s)
				• Other than focused camping, activities engaged in across the survey area involved hunting activities (larger game) by small hunting parties of men, and gathering activities by small parties of women and children, along with transitory movement, procurement of lithic resources, and cultural activities. • The utilisation of areas such as simple slopes, ridge crests, spur crests and minor watercourses was less intense than the valley flats where base camps were situated; • Simple slopes were used during hunting or gathering activities in the course of the normal daily or seasonal round, to access higher ground or stone resources, or to move between camp sites. Ridge and spur crests were also used for these purposes and for accessing vantage points or moving to special ceremonial sites; • Vantage points were important to the Aboriginal occupants of the area, particularly gentle to steep upper slopes adjacent to several ridges, which were mainly accessed by groups of men on hunting expeditions, or for security and/or cultural purposes; • Silcrete and tuff were the preferred stone materials, both of which are locally available and likely procured from local sources during the course of the normal daily or seasonal round, with tuff being the preferred material for manufacture of flaked stone tools; • These materials were also procured from other sources within the region, most notably the alluvial gravels of the nearby Hunter River; • Chert, quartz, petrified wood, chalcedony, and porcellanite were also utilised to a lesser extent and were also procured from local sources, probably during the course of the normal seasonal round; • Silcrete was deliberately heat treated to improve its flaking properties. This may have been undertaken at single locations (e.g., a campsite adjacent to a watercourse) or in different locations reflecting the stages of procurement, heat treatment, reduction and use); • Manufacturing stone tools, particularly flaked implements, was likely a casual or opportunistic activity, conducted on an “as needed” basis;	

Researcher(s)	Year(s)	Project(s)	Area to which the model applies	Summary of model	Reference(s)
				• There was little emphasis on rationing or conservation of the use of most stone materials, due to their wide availability; and • The manufacture of microblades (e.g., hunting spear barbs) was also widely undertaken. While likely a planned and organised activity, it did not necessarily occur at base camps, but may also have occurred in places traversed during the course of hunting expeditions on a more casual or opportunistic basis.	
Kuskie & Kamminga	2000	Salvage of sites impacted by the construction of the Hunter Expressway, near Black Hill	Black Hill - Woods Gully - Hexham Wetlands Locality, Lower Hunter Valley	• The locality was occupied by Aboriginal people of the Pambalong Clan and potentially clans of the broader Awabakal language group; • Occupation focused on wetlands, swamps, lakes, estuaries, the coastline, and potentially also the junctions of multiple resource zones; • Occupation of the area has predominantly occurred within the past 4,000 years; • Occupation may have extended as far back as 30,000 – 40,000 years, but few landscape contexts exist in which archaeological evidence of older occupation would be conserved; • Occupation encompassed the entire region, but at varying intensities, on a seasonal basis, and across different time periods within the overall time-span of occupation; • Seasonal occupation of some resources and localities may not be evidenced in the extant archaeological record; • Occupation of the area reflects a wide range of activities, including transition between locations, hunting, gathering, procurement and utilisation of lithic and other resources, camping, ceremonial and spiritual activities, and burial practices; • Activities conducted and engaged in by the Aboriginal occupants of the area likely included: food procurement, processing, and consumption; production and maintenance of stone and wooden tools and implements; resource procurement; erection of shelters, children's play, ceremonial and spiritual activity, and social and political activity; • Landscape features and variables such as topography, resources, proximity to water, aspect, slope, and cultural preference likely influenced the activities conducted by the Aboriginal occupants of the area;	Kuskie & Kamminga 2000

Researcher(s)	Year(s)	Project(s)	Area to which the model applies	Summary of model	Reference(s)
				• Few of the activities engaged in by past Aboriginal people are likely to be evident within the archaeological record, other than those involving the use of stone or where preservation conditions permit; • Locally available indurated rhyolitic tuff was the preferred material for knapping and stone tool production, followed by silcrete, which was also able to be procured locally in terrace and alluvial gravels; • Both tuff and silcrete were likely obtained during both daily and seasonal movements throughout the landscape on an “as needs” basis, not during “special purpose trips”, and conservation of these materials was not a priority due to their wide availability; • Other locally available stone materials including quartz, quartzite, acidic volcanics, chalcedony and chert were also utilised to a lesser extent; • Non-locally available stone materials such as dacite and rhyodacite (used for grindstones) may have been obtained through trade or exchange with other cultural groups, through special purpose trips, or during visits to other areas during the seasonal round; • Ochre was utilised for ceremonial purposes and may have been procured from sources near Lake Macquarie, the Hunter River, or from outside the region; • Heat treatment of silcrete was undertaken to improve flaking qualities and possibly to obtain desired colours; • A reasonably high proportion of silcrete used in knapping activities was deliberately heat treated, but tuff was not; • Microblade production was a widespread, likely planned and organised, activity with the primary goal of producing microliths (e.g., bondi points) for hunting implements/purposes. • Microblade production may have occurred at both campsites and also in places on transitory routes during hunting expeditions, which may represent more casual or opportunistic behaviour; • Production of microliths was time-consuming and the end result was likely highly desirable and socially valuable; • The investment of time and energy in activities such as heat treatment of silcrete and production of microliths for hunting and fighting spears may	

Researcher(s)	Year(s)	Project(s)	Area to which the model applies	Summary of model	Reference(s)
				have more social than utilitarian values, as floral and smaller faunal subsistence resources would probably have been most prominent in the economy of the local Aboriginal people.; • Casual and opportunistic knapping or selection of flakes to meet requirements on an “as needs” basis was widespread. • A high proportion of knapping products were likely discarded at the site of their manufacture, without use; • Use of bipolar technique was uncommon; • Floral subsistence resources were locally abundant, predominantly obtained and processed by women, and were consumed at campsites and at the site of procurement; • Ferns may have been a staple of the local diet, along with the bulbs and roots of other wetland plants; • Plant preparation sites may include camping places around the margins of Hexham Wetland and other swamps. Tools such as Worimi cleavers were utilised to pound the starch-rich rhizomes of bracken and swamp fern and the roots of other plants obtained from the wetlands; • Eloueras may have been used for extracting the perennial herb cumbungi (*Typha australis*), abundant in the freshwater parts of wetlands, or less likely, tall spike rush (*Eleocharis sphacelata*); • Less portable special tools such as Worimi cleavers and grindstones may have been deliberately stored at base camps; • Faunal resources were processed and consumed at temporary hunters or gatherers camps, at nuclear base camps, campsites of larger congregations of people, and at the site of procurement; • Men hunted for larger game, while women played a key role in gathering plants and obtaining smaller game; • Hunting was a planned and coordinated event; • Fish were obtained by several methods, including boating, hooks and lines, spearing, using hand nets, and creating fish traps; • Strategic management of resources such as fish traps was aimed at increasing the reliability and productivity of food resources;	

Researcher(s)	Year(s)	Project(s)	Area to which the model applies	Summary of model	Reference(s)
				• Nuclear family base camps may have been strategically positioned in relation to food resources, at the conjunction of two or more subsistence zones, close to potable water, and on level or very gently inclined ground. Visual aspect and security may have also been important considerations; • Site occupants of nuclear family base camps may have foraged within an area of up to 10 km radius from the campsite; • Campsites in more favourable locations may have been subject to more intensive occupation; and • Community base camps or camps of larger congregations of people tended to be situated on level ground adjacent to plentiful food resources and potable water such as river terraces or flats.	

6.2 Local Archaeological Context

6.2.1 AHIMS Database

The AHIMS database, administered by the OEH, contains records of all Aboriginal objects reported to the Secretary of the Department of Premier and Cabinet in accordance with Section 89A of the *National Parks and Wildlife Act 1974*. It also contains information about Aboriginal places 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 11 May 2018 for a 20 x 20 km area surrounding the study area resulting in the identification of 1,621 Aboriginal sites, comprising 1,594 open artefact sites (i.e., isolated artefacts and artefact scatters) (18 of which have associated areas of Potential Archaeological Deposit [PAD]), 15 modified trees (two with associated artefacts), five grinding groove sites, four stone quarries, one area of PAD, one midden and one burial (Table 9).

Consideration of the location of previously recorded Aboriginal sites indicates that 231 are located wholly or partially within the study area comprising 227 open artefact sites (i.e., artefact scatter and isolated artefacts), two modified trees and two stone quarries. From these sites, it is noted that the two modified tree sites (AHIMS #37-2-1945 and 37-2-1944) were assessed by Registered Aboriginal Parties (RAPs) and an arborist as not Aboriginal sites as part of the Drayton South Coal Project (AECOM 2012) and updated site cards submitted to the OEH. It is also noted that stone quarry site 'SC-QS-1/Quarry' (AHIMS# 37-2-1955) recorded by Mills (2000) within the study area was not located during AECOM's (2012) assessment or the current assessment.

Taking into account the above issues, a total of 228 Aboriginal sites comprising 227 open artefact sites and one stone quarry are recognised as being located wholly or partially within the study area. Considered of the location of previously recorded sites in relation to project elements indicates the following:

- 23 sites (all open artefact sites) are located wholly or partially within the proposed surface development areas;
- 203 sites (202 open artefact sites and one stone quarry) are located wholly or partially above the proposed underground mining area; and
- two sites (all open artefact sites) are located wholly or partially within both the proposed surface development areas and above the proposed underground mining area.

Table 9 Site search results (20 x 20 km area)

Site Type	Count	%
Open artefact site (i.e., isolated artefacts and artefact scatters)	1,576	97.2
Open artefact site with PAD	18	1.1
Modified tree	13	0.8
Modified trees + artefact	2	0.1
Grinding groove	5	0.3
Stone quarries	4	0.2
PAD	1	0.1
Midden	1	0.1
Burial	1	0.1
Total	**1,621**	**100**

Table 10 Sites within the study area

Site Type	Count	%
Open artefact site (i.e., isolated artefacts and artefact scatters)	227	99.6
Stone quarries	1	0.4
Total	**228**	**100**

Table 11 Sites by surface development and underground mining

Activity	Open artefact site	Stone quarry	Total	%
Surface development	23	0	23	10.1
Underground mining	202	1	203	89
Surface development and underground mining	2	0	2	0.9
Total	**227**	**1**	**228**	**100**

In addition to the above sites, on 8 October 2018 AECOM was notified by Scott Franks acting on behalf of the PCWP, that five sites were registered on AHIMS that may be relevant to the Project. AECOM subsequently requested a copy of the site cards from Mr Franks, however was informed that the site cards were restricted. Instead, Mr Franks provided maps showing the site boundaries. AECOM georeferenced the maps and determined that one of the sites was partially located in the north-eastern section of the study area.

In an attempt to gather more information about the sites, AECOM requested a copy of the site cards from the Heritage Information Officer at OEH on 12 October 2018. OEH responded:

"Unfortunately all the Site Cards you have listed below are "Under Investigation" and I won't be able to release any information relating to them to you. They are also all Restricted, so even if they were not 'Under Investigation' as per our normal procedures you would need Aboriginal Community Permission to access them".

From discussions AECOM has had with Mr Franks for the Project and other developments, it is understood that these sites represent locations where local Aboriginal people lived, sustained a continued connection to Country and include areas where conflict between Aboriginal people and European settlers and police occurred.

AECOM understands that these sites are currently listed on the AHIMS database as 'not a site'.

6.2.2 Previous Archaeological Investigations within the Study Area

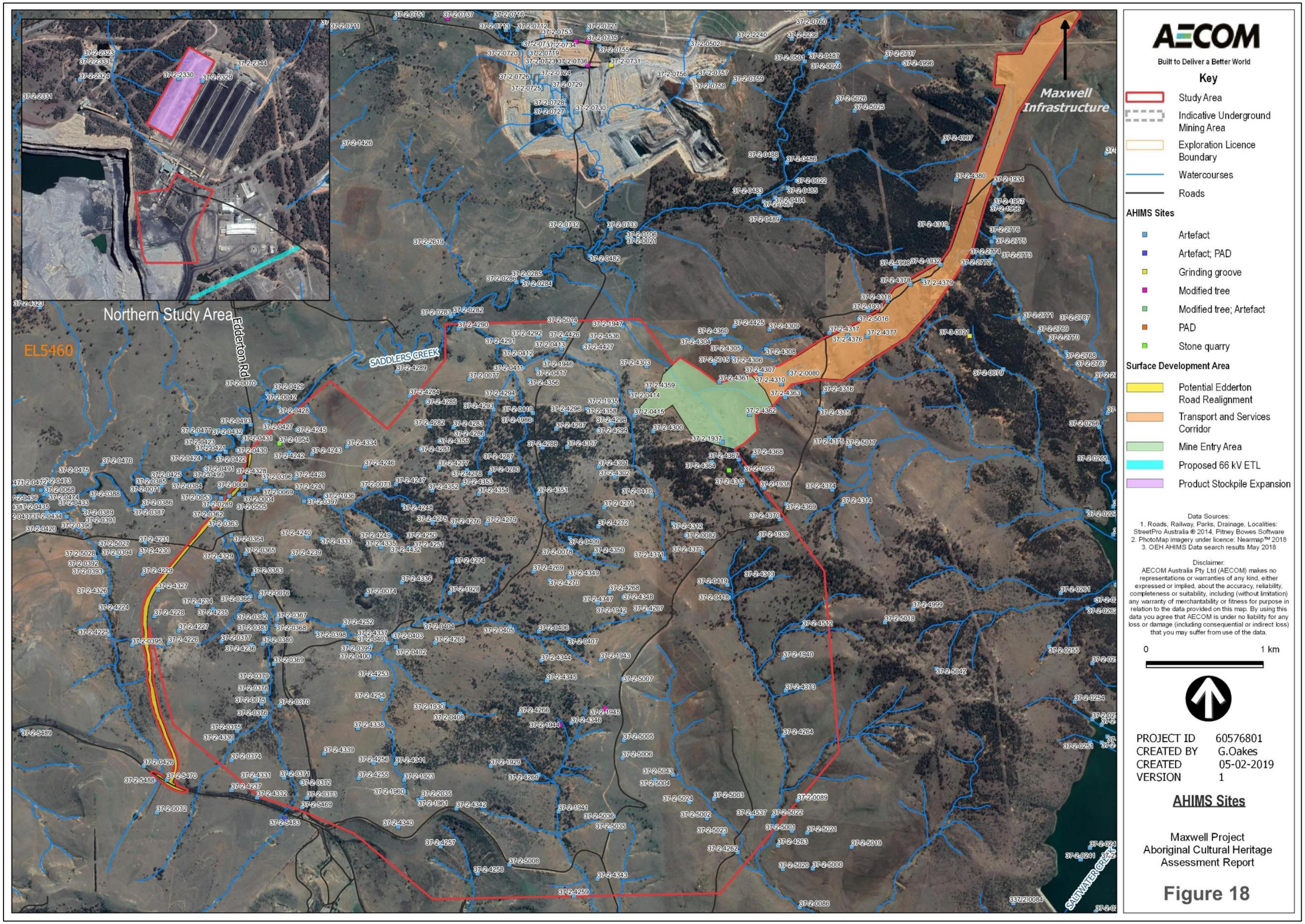
Existing AHIMS data indicates that numerous Aboriginal archaeological investigations incorporating survey and/or test excavation have been undertaken within or directly adjacent to the study since the 1980s. Investigations undertaken directly within the study area include targeted surveys by Dyall (1980), Mills (2000), HLA Envirosciences (2002), Archaeological Risk Assessment Services (2006), and AECOM (2012). Two test excavation programs have been completed in the 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 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 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. 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 (53.4%) flakes, 41 (17.2%) block fracture fragments, 28 (11.8%) cores, 19 (8%) flake fragments, seven (2.9%) scrapers, five (2.1%) manuports, four (1.7%) hammerstones, three (1.3%) backed blades, one sharpening stone, one millstone, one anvil and one pebble axe. Indurated mudstone/tuff was the dominant material (48.32%), followed by silcrete (31.51%), quartzite (5.46%), chert (5.04%), quartz (2.94%), porcellanite (2.10%), siltstone (2.10%), sandstone (0.84%), basalt (0.84%), fossilised wood (0.42%), and glass (0.42%).
- HLA Envirosciences (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, ridgelines 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 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.

Figure 18 AHIMS Sites



6.3 Archaeological Predictions

A review of the existing archaeological and environmental context of the 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 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 with reasonable potential to occur include scarred trees, stone quarries and grinding grooves;
- site types with limited potential to occur include stone arrangements and burials;
- excluding those portions of the study area that have been grossly disturbed through historical land use activities or severely affected by erosion[14], most areas, irrespective of the presence or absence of associated surface evidence, will contain subsurface archaeological deposits, albeit of highly variable character and extent;
- surface and subsurface artefact distribution within the study area will vary significantly in relation to landform, distance to water and stream order;
- most, if not all, of the Aboriginal archaeological materials present within the 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;
- grinding groove sites, if present, will occur in direct association with watercourses;
- burial sites, if present, will occur in floodplain or terrace contexts;
- the dominant raw material for flaked stone artefact production within the 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.

[14] ie., complete loss of potential artefact-bearing topsoils

7.0 Archaeological Survey

7.1 Survey

7.1.1 Aim and Objectives

The aim of the archaeological survey was to identify, record and map Aboriginal heritage values within the study area. These values include both the tangible remains of past Aboriginal activity (i.e., archaeological evidence) as well as intangible cultural values. To achieve these aims, the following specific survey objectives were developed:

- to comprehensively survey, by pedestrian transects, land within the study area;
- to identify and record Aboriginal archaeological sites within the study area;
- to inspect, where appropriate, areas of known or potential Aboriginal cultural value, including AHIMS sites and areas identified by RAP representatives; and
- to obtain sufficient data to facilitate the development of appropriate management and mitigation measures for identified Aboriginal sites and areas of archaeological sensitivity.

7.1.2 Methodology

A field team of two AECOM heritage specialists (Geordie Oakes and Dr Darran Jordan) and RAP representatives completed the archaeological survey of the study area over nine days including 15-17 and 20-24 August 2018 and 24 October 2018. As noted in Section 3.0, the project methodology issued to RAPs on 19 July 2018 indicated that archaeological survey was proposed within those portions of the study area not previously surveyed as part of the Drayton South Coal Project (AECOM 2012). Combined with the AECOM (2012) survey, which ran over 26 days, the current survey resulted in full survey coverage of the study area.

All survey for the previous survey and the current survey was conducted on foot, with a total of 17 transects executed across the study area for the current field program. Participants in the survey (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., GSV and GI ratings) entered directly into the same unit upon the completion of each transect.

7.1.3 Site Definition

The definition, in spatial terms, of Aboriginal archaeological sites is a topic of considerable importance to modern cultural heritage management, and is 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, of course, 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 aggradation, 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 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 excavation projects in south-eastern Australia, 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 50 m 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/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.

7.2 Survey Results

7.2.1 Survey Coverage and Effective Coverage

As indicated in Section 7.1.2 and shown on Figure 19, a total of 17 pedestrian transects were completed over the study area for the current field program (in addition to the 46 transects undertaken as part of the AECOM [2012] surveys). While all parts of the study area and all landforms were investigated, recorded transect data indicate that a total survey coverage, when combined with the AECOM (2012) survey, of approximately 2,269 ha of the total study area of 2,343 ha (i.e., 96.8%) 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. Effective coverage estimates for each transect completed during the current survey, shown in Table 12, are, for the most part good, with 11 exceeding 10%. Ground Surface Visibility (GSV) across the study area was average, ranging from 20%-90%[15]. Areas of enhanced GSV comprised erosion exposures, ploughed fields and along access tracks. Calculation of the total effective coverage achieved for the current survey indicates that around 15.9% (*c*.88 ha) of the survey area could be effectively surveyed for surface Aboriginal archaeological materials.

Effective coverage estimates for transects completed during the current survey, combined with those completed within the study area as part of the AECOM (2012) surveys, suggest overall effective coverage of the study area was good with a total of 15.9 % effective survey coverage achieved for the current survey and 11.1 % was achieved for the past Drayton South Coal Project area.

[15] The *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) describes visibility as 'Visibility is the amount of bare ground (or visibility) on the exposures which might reveal artefacts or other archaeological materials"

Table 12 Effective coverage data for the current survey

Survey Unit	Landform Units	Survey Unit Area (ha)	Visibility %	Exposure %	Effective coverage of the Survey Area (ha)	Effective coverage of the Survey Area %
Transect 1	Lower, middle, upper slope, crest	28.7	30	40	3.444	12
Transect 2	Middle, upper slope, crest	15.8	20	60	1.896	10
Transect 3	Lower, middle, upper slope, crest	53.5	30	40	6.42	12
Transect 4	Lower, middle, upper slope, crest, flat	61.1	30	60	10.998	18
Transect 5	Lower, middle, upper slope, crest, flat	56.1	20	50	5.61	10
Transect 6	Lower, middle, upper slope, crest, flat	45.6	40	30	5.472	12
Transect 7	Lower, middle, upper slope, crest, flat	19.6	30	50	2.94	15
Transect 8	Lower, middle, upper slope, crest, flat	52.4	30	80	12.576	24
Transect 9	Middle, upper slope, crest	62.1	30	90	16.767	27
Transect 10	Middle, upper slope, crest	39	20	50	3.9	10
Transect 11	Lower, middle, upper slope, crest, flat	47	30	60	8.46	18
Transect 12	Lower, middle, upper slope, crest, flat	11.4	20	50	1.14	10
Transect 13	Lower, middle, upper slope, crest, flat	4.2	10	60	0.252	6
Transect 14	Lower, middle slope	32.1	40	20	2.568	8
Transect 15	Lower, middle, upper slope, crest, flat	22.2	40	50	4.44	20
Transect 16	Middle slope	3.3	50	60	0.99	30
Transect 17	Middle, upper slope, crest	1.1	30	50	0.165	15
Total		**555.2**	**-**	**-**	**88.04**	**15.9**

7.3 Surface Artefacts

7.3.1 Current Archaeological Survey

A total of 545 individual stone artefacts were recorded during the current archaeological survey (Appendix K). A simplified typological breakdown of the recorded assemblage (Table 13) shows that the assemblage is dominated by flake debitage items (76.5%) comprising complete flakes (n=242, 44.4%), flake shatter (n=150, 27.5%), proximal flakes (n=17, 3.1%) and split flakes (n=8, 1.5%). Non-flake debitage items (i.e., angular shatter) make up the next largest portion of the assemblage (n=73, 13.4%).

Formed objects (i.e, tools, cores) make up the remainder of the assemblage with retouched flakes (n=4, 0.7%), complete and broken cores (n=40, 7.3%), axes (n=9, 1.6%) and choppers (n=2, 0.4%). The most common raw material recorded was silicified tuff (n=369, 67.9%), followed by silcrete (n=116, 21.1%), chert (n=17, 3.1%), quartz (n=14, 2.6%), porcellanite (n=9, 1.7%), basalt (n=6, 1.1%), FGS other (n=8, 1.5%), quartzite (n=5, 0.9%), and volcanic (n=1, 0.2%).

Recovered artefacts were generally medium sized, with an average maximum linear dimension of 33.1±19.8 mm (range: 6.5-141 mm) (Table 14).

Identified cores include 28 unidirectional, 10 multidirectional and one bidirectional cores manufactured on varying blanks (i.e., cobbles, flakes etc.).

Cortex is moderately well represented in the survey assemblage, with 42 artefacts retaining cortex at discard.

Nine axes, three broken and three exhibiting ground surfaces, were recorded in the assemblage with basalt being the common raw material utilised. Two large chopping tools were also recorded.

Table 13 Simplified typological breakdown of artefacts

Type	Silcrete	Tuff	Quartz	Chert	Basalt	Porcellanite	Quartzite	FGS Other	Volcanic	Total (n)	% Total
Complete flakes	52	166	8	8	0	1	4	2	1	242	44.40
Flake shatter	35	102	4	5	0	3	1	0	0	150	27.52
Proximal flake	3	9	0	1	0	4	0	0	0	17	3.12
Angular shatter	15	54	1	3	0	0	0	0	0	73	13.39
Split flake	3	5	0	0	0	0	0	0	0	8	1.47
Retouched flake	0	4	0	0	0	0	0	0	0	4	0.73
Cores	7	28	1	0	0	1	0	2	0	39	7.16
Core frag	0	1	0	0	0	0	0	0	0	1	0.18
Axe (including broken)	0	0	0	0	6	0	0	3	0	9	1.65
Chopper	1	0	0	0	0	0	0	1	0	2	0.37
Total (n)	**116**	**369**	**14**	**17**	**6**	**9**	**5**	**8**	**1**	**545**	100
% Total	21.10	67.89	2.57	3.12	1.10	1.65	0.92	1.47	0.18		

Table 14 Descriptive statistics for the size of artefacts

Attribute	N	Mean	StDev	Min	Max
MLD (mm)	545	33.1	19.8	6.5	141

When combined with artefact data obtained as part of the AECOM (2012) surveys a total of approximately 4,018 surface artefacts have been identified within the study area. A simplified typological breakdown of artefacts, where detailed data was recorded, is provided below. As shown, raw materials and typologies are consistent with those identified as part of the current assessment.

Table 15 Simplified typological breakdown of artefacts

Type	Silcrete	Tuff	Quartz	Basalt	Porcellanite	Quartzite	FGS Other	Volcanic	Chalcedony	Total (n)	% Total
Complete flakes	290	858	28		2	5	10	1		1194	49.08
Flake shatter	163	573	11		5	1				753	30.95
Proximal flakes	7	31			4					42	1.73
Angular shatter	20	176	1		4				1	202	8.30
Split flake	3	5								8	0.33
Retouched flake	3	17		1			1			22	0.90
Core	65	109	5		1	3	3			186	7.64
Core frag		1								1	0.04
Axe				16			4			20	0.82
Chopper	1						1			2	0.08
Grindstone							1			1	0.04
Hammerstone							2			2	0.08
Total (n)	**552**	**1770**	**45**	**17**	**16**	**9**	**22**	**1**	**1**	**2433**	**100**
% Total	22.69	72.75	1.85	0.70	0.66	0.37	0.9	0.04	0.04		

7.4 Sites

A total of 275 Aboriginal archaeological sites, comprising 274 open artefact sites (i.e., artefact scatters and isolated artefacts) and one stone quarry have been identified within the study area[16] (Figure 21). These include:

- 228 previously recorded AHIMS sites; and
- 47 new sites recorded during the current survey.

The 47 new Aboriginal archaeological sites recorded within the study area during the current assessment all comprised open artefact sites. Site details are provided in Table 16 below with their locations shown on Figure 21 and site cards provided in Appendix L.

Table 16 Aboriginal archaeological sites within the study area recorded by AECOM 2019

AHIMS Site ID	Site name	AHIMS Centroid Coordinates (zone 55)		Site type
		MGAE	MGAN	
37-2-5848	MP-IA2-18	295488	6411669	Isolated artefact
37-2-5849	MP-IA3-18	294650	6409946	Isolated artefact
37-2-5883	MP-IA4-18	294804	6409755	Isolated artefact

[16] Note, six additional sites were recorded outside the study area during the archaeological survey (37-2-5895, 37-2-5894, 37-2-5898, 37-2-5850, and 37-2-5873, 37-2-5863). Site cards for these sites are provided in Appendix L.

AHIMS Site ID	Site name	AHIMS Centroid Coordinates (zone 55)		Site type
		MGAE	MGAN	
37-2-5861	MP-IA5-18	295245	6409343	Isolated artefact
37-2-5897	MP-IA6-18	296981	6408244	Isolated artefact
37-2-5896	MP-IA7-18	297119	6408254	Isolated artefact
37-2-5893	MP-IA10-18	298240	6408761	Isolated artefact
37-2-5891	MP-IA11-18	298692	6408101	Isolated artefact
37-2-5892	MP-IA12-18	298704	6408304	Isolated artefact
37-2-5890	MP-IA13-18	298435	6408666	Isolated artefact
37-2-5889	MP-IA14-18	298967	6408171	Isolated artefact
37-2-5888	MP-IA15-18	299092	6408519	Isolated artefact
37-2-5886	MP-IA16-18	299362	6410111	Isolated artefact
37-2-5887	MP-IA17-18	299348	6409834	Isolated artefact
37-2-5868	MP-IA18-18	299209	6409376	Isolated artefact
37-2-5884	MP-IA19-18	300460	6409287	Isolated artefact
37-2-5851	MP-IA22-18	300489	6412607	Isolated artefact
37-2-5852	MP-IA23-18	300289	6412560	Isolated artefact
37-2-5854	MP-IA24-18	301573	6413490	Isolated artefact
37-2-5853	MP-IA25-18	300352	6412669	Isolated artefact
37-2-5840	MP-AS1-18	295012	6410975	Artefact scatter
37-2-5841	MP-AS2-18	294922	6410880	Artefact scatter
37-2-5842	MP-AS3-18	294827	6410742	Artefact scatter
37-2-5885	MP-AS4-18	294968	6409377	Artefact scatter
37-2-5882	MP-AS5-18	295143	6409263	Artefact scatter
37-2-5843	MP-AS6-18	294865	6409079	Artefact scatter
37-2-5881	MP-AS7-18	297273	6408458	Artefact scatter
37-2-5880	MP-AS8-18	296732	6408295	Artefact scatter
37-2-5879	MP-AS9-18	297242	6407982	Artefact scatter
37-2-5878	MP-AS10-18	297557	6407946	Artefact scatter
37-2-5877	MP-AS11-18	297881	6408312	Artefact scatter
37-2-5876	MP-AS12-18	297775	6408596	Artefact scatter + PAD
37-2-5875	MP-AS13-18	298366	6409045	Artefact scatter + PAD

AHIMS Site ID	Site name	AHIMS Centroid Coordinates (zone 55)		Site type
		MGAE	MGAN	
37-2-5874	MP-AS14-18	298072	6408387	Artefact scatter
37-2-5872	MP-AS16-18	298516	6408413	Artefact scatter
37-2-5871	MP-AS17-18	298547	6409313	Artefact scatter
37-2-5869	MP-AS18-18	299039	6409147	Artefact scatter
37-2-5870	MP-AS19-18	299325	6409191	Artefact scatter
37-2-5867	MP-AS20-18	299210	6409490	Artefact scatter
37-2-5866	MP-AS21-18	298862	6409631	Artefact scatter
37-2-5865	MP-AS22-18	299095	6409935	Artefact scatter + PAD
37-2-5864	MP-AS23-18	299324	6409645	Artefact scatter
37-2-5844	MP-AS25-18	299273	6412434	Artefact scatter
37-2-5845	MP-AS26-18	300440	6412448	Artefact scatter
37-2-5846	MP-AS27-18	301739	6413895	Artefact scatter
37-2-5847	MP-AS28-18	301932	6414599	Artefact scatter
37-2-5862	MP-AS29-18	299070	6409642	Artefact scatter + PAD

7.4.1 Open Artefact Sites

A total of 274 open artefact sites (i.e., artefact scatters and isolated artefacts) of various sizes and artefact densities were identified within the study area. These include 227 previously recorded open artefact sites and 47 new sites recorded as part of the current assessment. Together, these sites contained 4,018 stone artefacts. Artefact scatters (n=27) and isolated artefacts (n=20) were more-or-less equally represented within the study area representing 57% and 43% of the total of new sites respectively. Of the 27 artefact scatter sites, four have associated areas of PAD.

7.4.2 Stone Quarries

Two stone quarry sites have been previously identified within the study area, both by Mills (2000). These include AHIMS registered sites ‘SC-QS-2’ (AHIMS #3-37-2-1954) and ‘SC-QS-1’ (AHIMS #37-2-1955). Reference to the site card for SC-QS-2 indicates this site covers an area of approximately 500 m² and comprises numerous silcrete, chert, mudstone and quartzite cobbles/boulders scattered across a wide area. The site card notes evidence of use includes the presence of a large number of cores and flakes, both primary and secondary. AECOM’s inspection of the area likewise identified a large number of silcrete and chert cobbles/boulders dispersed over a large area. However, AECOM found the number of artefacts associated with the cobbles/boulders was relatively small with only a handful identified. It was concluded that while the site meets the broad definition of what constitutes a quarry (i.e., “the location of an exploited stone source” [Hiscock & Mitchell 1993]) evidence of on-site reduction was limited. As discussed in Section 6.1.4, 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). In relation to site SC-QS-2, the former (i.e., assaying) is more consistent with evidence observed at the site. The primary activity likely to have taken place onsite is raw material selection with limited on-site reduction, and selected material potentially transported elsewhere for reduction.

Reference to the site card for SC-QS-1 indicates the site covers an area of 150 m x 30 m with cobbles/boulders of mudstone, silcrete, chert, fossilised wood and river pebbles having been identified. Despite several attempts, AECOM was unable to locate the cobbles/boulders described in the site card in the vicinity of the registered site location. The description provided by Mills (2000) of the site contains no information of the number and types of artefacts located at the site. However, photographs of artefacts identified at the site are provided in the report (Mills 2000). As SC-QS-1 was not located, the site has not been included in the archaeological survey results. However, potential impacts to SC-QS-1 have been considered in Section 9.

7.5 Spatial Distribution

The distribution of Aboriginal archaeological materials within any given landscape can be assessed from two analytical positions. The first, known as a site-based approach, utilises the 'site' as the basic unit of analysis whilst the second, referred to as a non-site approach, utilises the individual artefact as the unit of analysis.

The non-site approach is employed here as a means of assessing the relationship of recorded artefacts to the environmental variables of distance to water and landform.

7.5.1 Distance to Watercourse

The proximity and permanency of potable water sources are routinely cited as key determinants of Aboriginal settlement patterns. Accordingly, Table 17 tabulates the relationship of these variables to recorded artefact locations as part of the current assessment. In terms of distance to water, as indicated, the highest count of artefacts were identified within the 0-100 m distance range (68.8%, n = 375) followed by the 101-200 m range (22.8%, n=124), 201-300 m, (5%, n=27), 301-400 m, (2.8%, n=15), 401-500 m, (0.3%, n=2) and 501-600 m, (0.3%, n=2) demonstrating a clear trend of lower artefact counts as distance from creekline increases.

The majority of artefacts were associated with 1st order creeklines (62.8%, n=342). Nonetheless, 1st order creeklines within the study area are unlikely to have been a source of permanent potable water, unlike 3rd and 4th order streams.

Table 17 Relationship between watercourses distance/stream order and artefact counts (current assessment)

Distance to Water Source (m)	Creekline Order			Total	% of Total
	1	2	3		
0 – 100	248	127	0	**375**	68.8
101 – 200	60	62	2	**124**	22.75
201 – 300	21	3	3	**27**	4.95
301 – 400	10	2	3	**15**	2.75
401 – 500	2	0	0	**2**	0.37
501 – 600	1	0	1	**2**	0.37
Total	**342**	**194**	**9**	**545**	**100**
% of Total vs. Stream Order	**62.8**	**35.6**	**1.7**		

When combined with artefacts recorded within the study area as part of the AECOM (2012) surveys, distance to watercourse percentages largely mirror results from the current assessment. The highest count of artefacts was identified within the 0-100 m distance range (79%, n = 3192) followed by the 101-200 m range (15.2%, n=612), 201-300 m, (2.9%, n=116), 301-400 m, (1.6%, n=65), 401-500 m, (0.7%, n=28) and 501-600 m, (0.1%, n=5) demonstrating a clear trend of lower artefact counts as distance from creekline increases.

Table 18 Relationship between watercourses distance/stream order and artefact counts (combined)

Distance to Water Source (m)	Creekline Order			Total	% of Total
	1	2	3		
0 – 100	1880	1104	208	**3192**	79.44
101 – 200	309	227	76	**612**	15.23
201 – 300	82	30	4	**116**	2.89
301 – 400	58	4	3	**65**	1.62
401 – 500	26	0	2	**28**	0.70
501 – 600	4	0	1	**5**	0.12
Total	**2359**	**1365**	**294**	**4018**	**100**
% of Total vs. Stream Order	**58.71**	**33.97**	**7.32**		

7.5.2 Landform Analysis

Examination of the distribution of recorded artefacts in relation to landform indicates a trend towards higher artefact counts on lower slopes (62.2%, n=339) followed by flats (17.8%, n=97).

Table 19 Artefact distribution in relation to landform (current assessment)

Landform Type	No. of Artefacts	%
Crest	22	4.04
Upper slope	16	2.94
Middle slope	71	13.03
Lower slope	339	62.20
Flat	97	17.80
Total	**545**	**100**

When combined with artefacts recorded within the Maxwell study area as part of the AECOM (2012) surveys, distribution of artefacts in relation to landform likewise indicates a trend towards higher artefact counts on lower slopes (47.01%, n=1,889) followed by flats (30.96%, n=1,244).

Table 20 Artefact distribution in relation to landform (combined)

Landform Type	No. of Artefacts	%
Crest	60	1.49
Upper slope	63	1.57
Middle slope	682	16.97
Lower slope	1889	47.01
Flat	1244	30.96
Disturbed	80	1.99
Total	**4018**	**100**

7.6 Archaeological Sensitivity: Subsurface Archaeological Potential

Subsurface archaeological potential is addressed in the context of this assessment by the concept of 'archaeological sensitivity'. Figure 22 provides archaeological sensitivity mapping based on four key factors including the nature and extent of visible surface artefacts across the 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 study area to assess levels of potential subsurface deposit.

As shown on Figure 22, much of the 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 study area with fewer artefacts identified within these areas. Areas of high archaeological sensitivity have been linked to flats, lower slopes, crests and creeklines, and areas where surface artefacts have been identified in quantities considered greater than 'background scatter'. Areas of nil archaeological sensitivity are associated with areas of gross disturbance.

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 study area's archaeological resource and would be managed as part of the ACHMP.

Figure 19 Survey Coverage

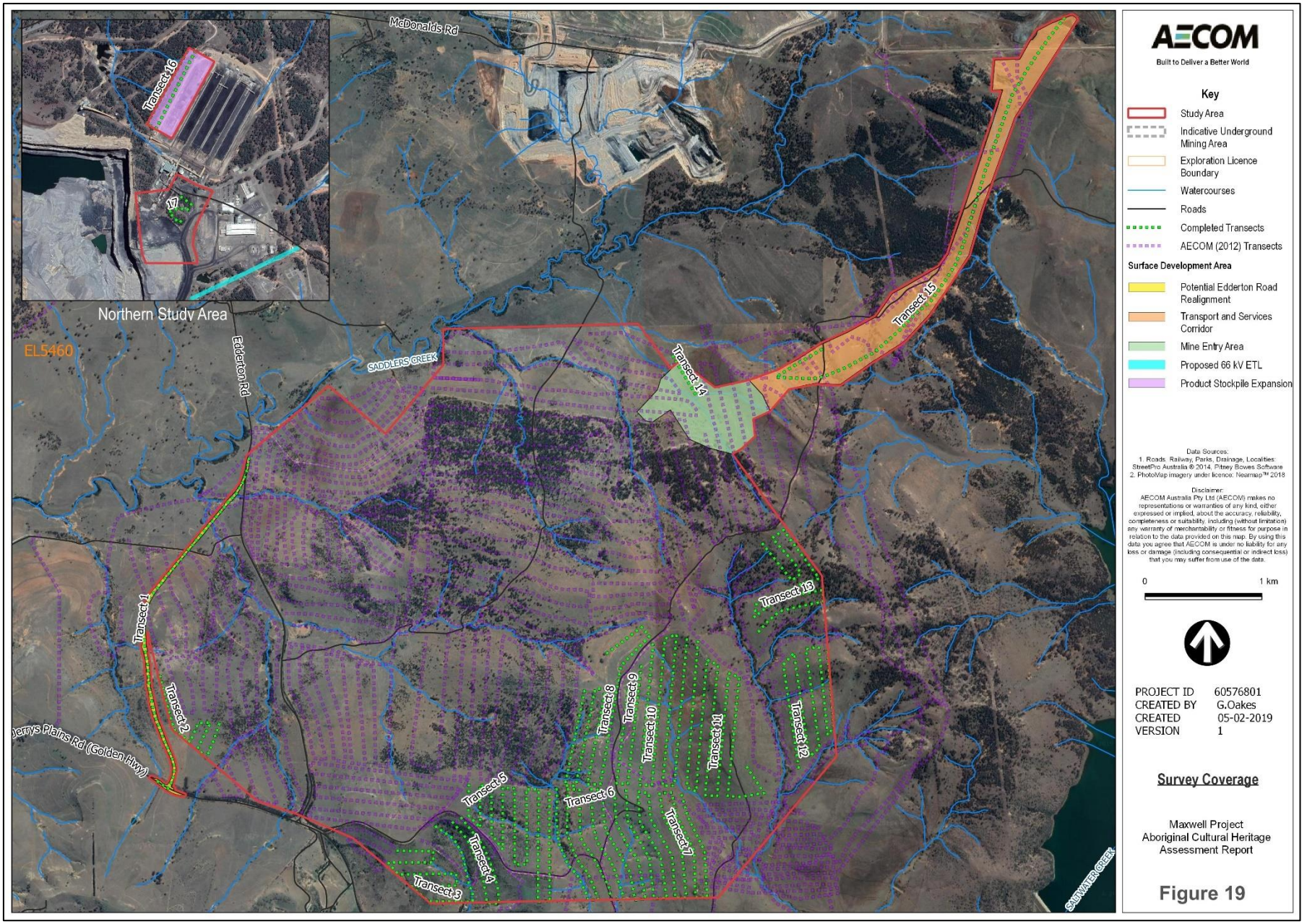


Figure 20 Surface Artefacts

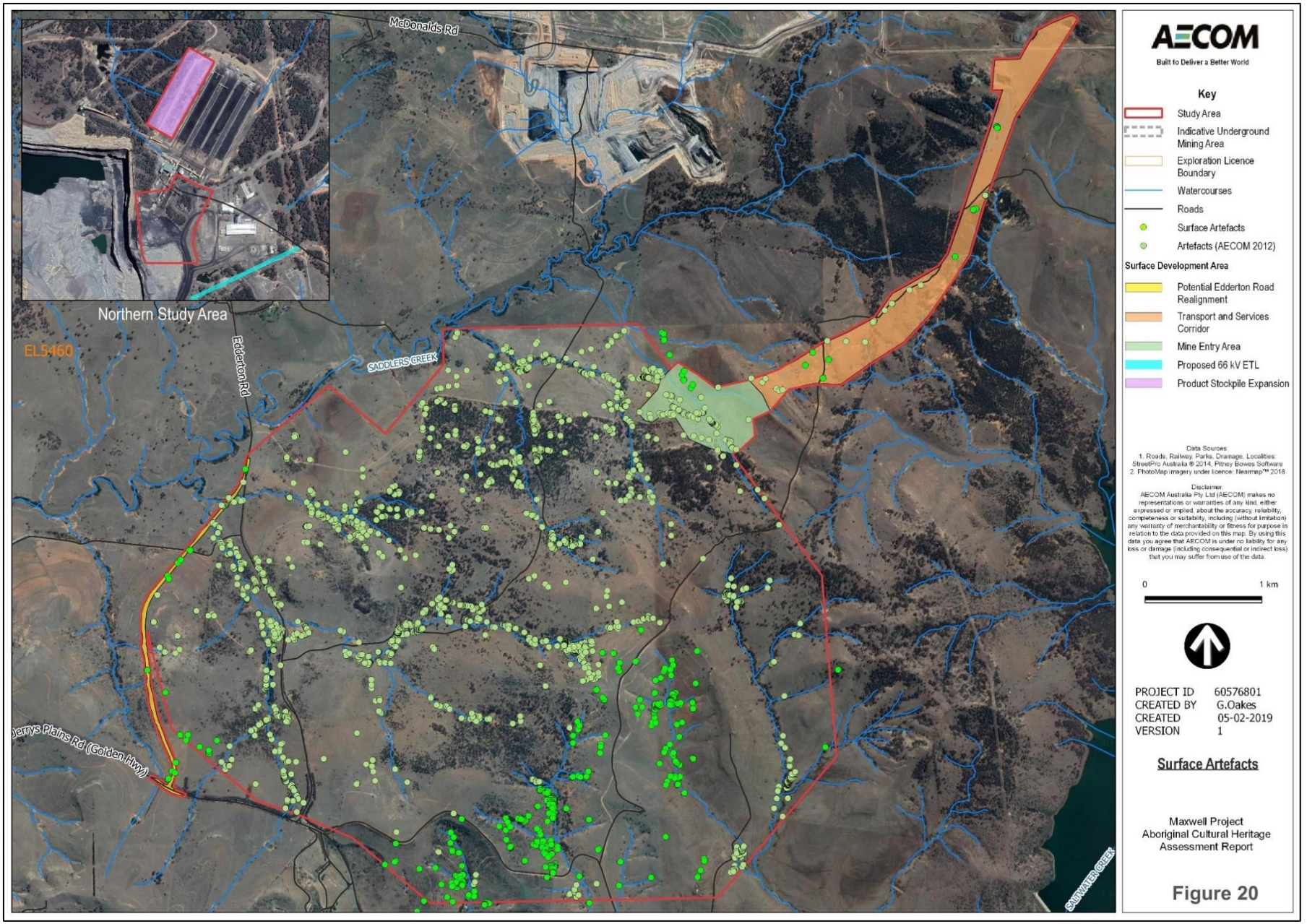


Figure 21 Aboriginal Sites

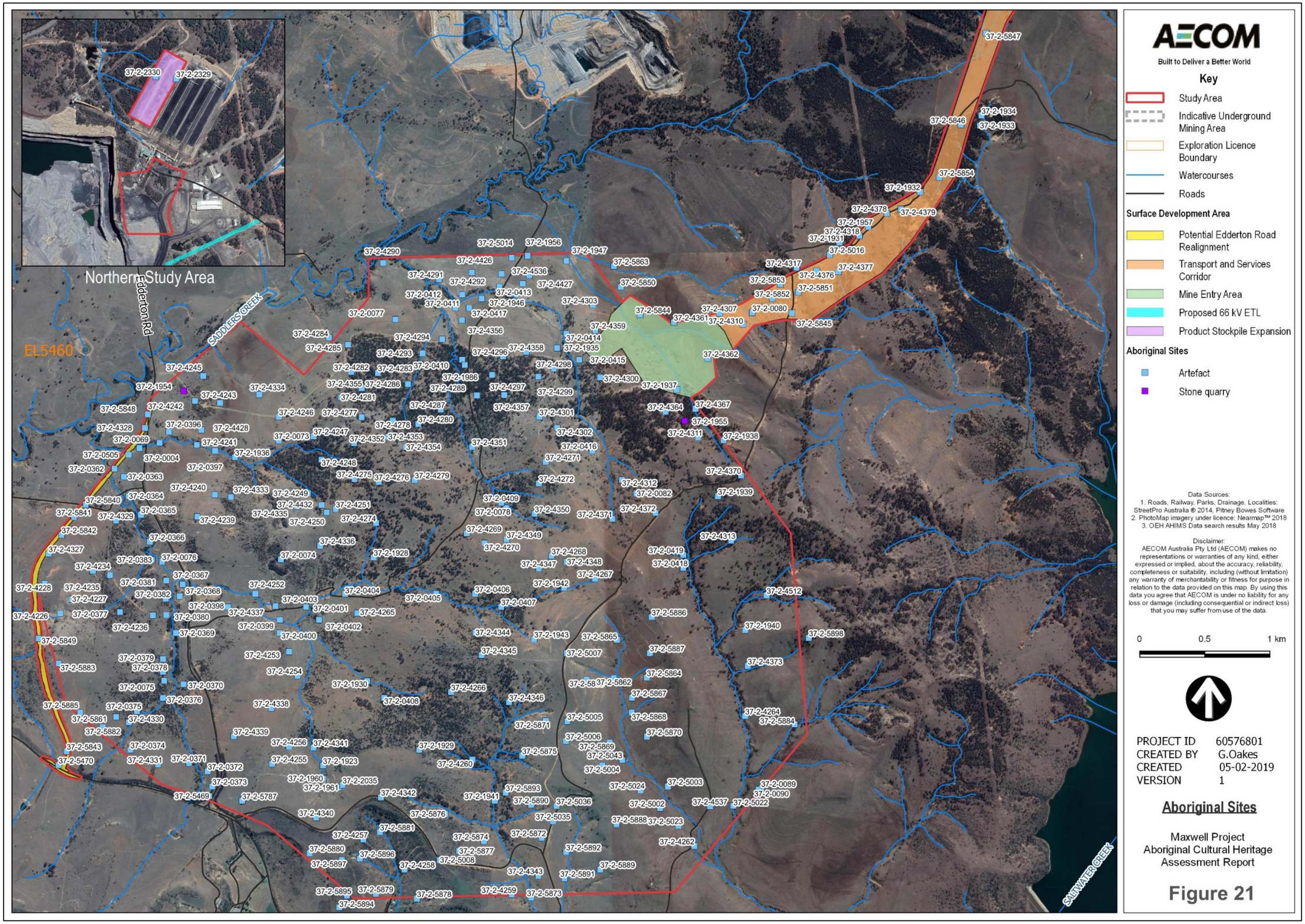
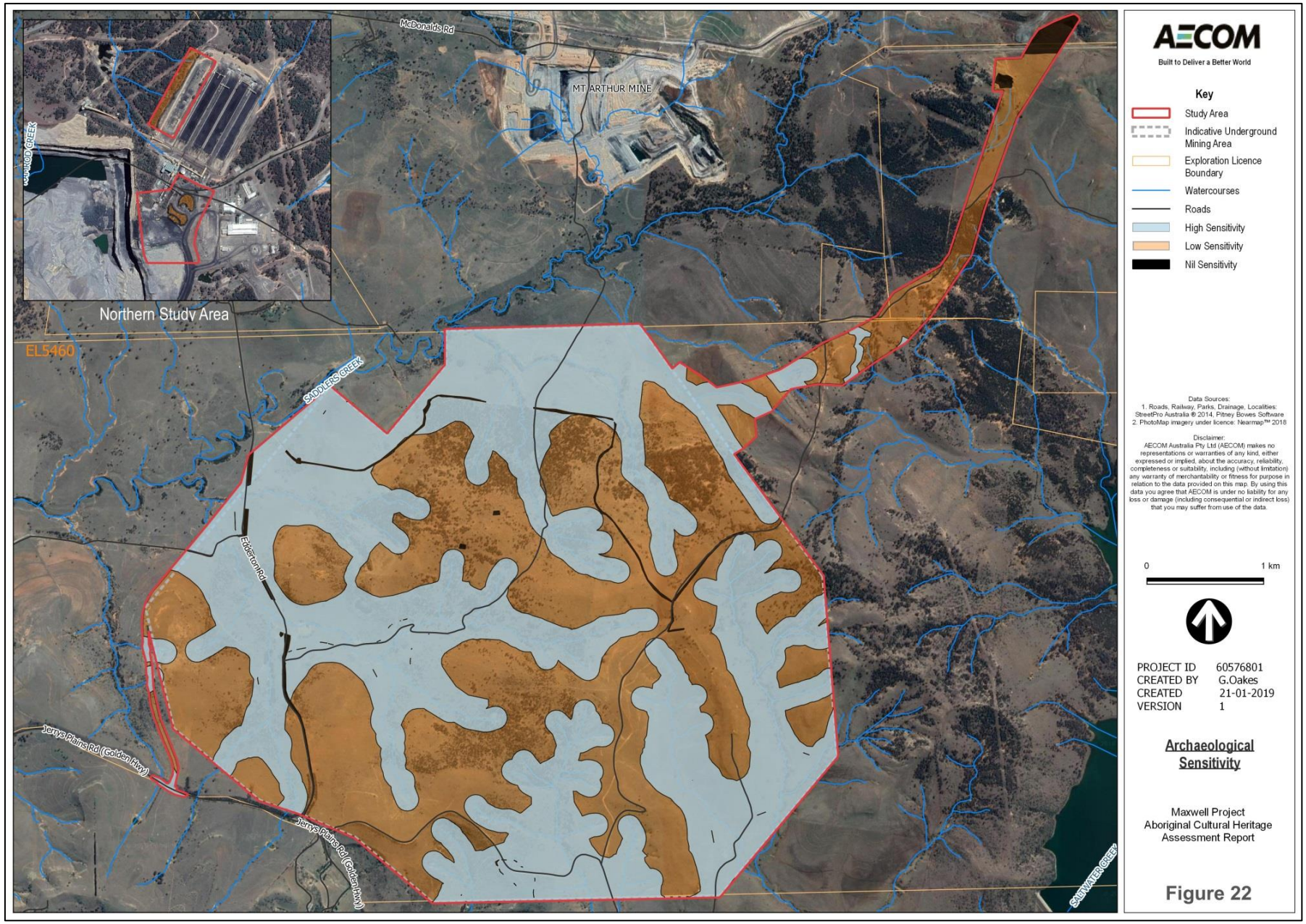


Figure 22 Archaeological Sensitivity



7.7 Evaluation of Predictive Model

Table 21 provides an evaluation of the predictive model provided in Section 6.3.

Table 21 Evaluation of Predictive Model

Prediction	Survey Result
Open artefact sites (i.e., artefact scatters and isolated artefacts) will be the dominant site type	The results of the assessment support this prediction.
Site types with reasonable potential to occur include scarred trees, stone quarries and grinding grooves	The results of the assessment support this prediction.
Site types with limited potential to occur include stone arrangements and burials	The results of the assessment support this prediction.
Excluding those portions of the study area that have been grossly disturbed through historical land use activities or severely affected by erosion[17], most areas, irrespective of the presence or absence of associated surface evidence, will contain subsurface archaeological deposits, albeit of highly variable character and extent	Previously completed archaeological investigations incorporating test excavation within and adjacent to the study area support this prediction.
Surface and subsurface artefact distribution within the study area will vary significantly in relation to landform, distance to water and stream order	The results of the assessment support this prediction.
Most, if not all, of the Aboriginal archaeological materials present within the study area will be of mid-to-late Holocene antiquity	The results of the assessment support this prediction.
The dominant raw material for flaked stone artefact production within the study area will be silicified tuff and/or silcrete	The results of the assessment support this prediction.
Flaked stone artefact assemblages will be dominated by flake and non-flake debitage items (*sensu* Andrefsky 2005), with formed objects (i.e., cores and retouched implements) comparatively poorly represented	The results of the archaeological survey support this prediction.
Raw material sources suitable for knapping are likely to be present within the study area and may be associated with the Hunter River	The results of the archaeological survey support this prediction.
Tool types of demonstrated chronological significance will be restricted to backed artefacts and/or edge-ground hatchet heads	The results of the archaeological survey support this prediction.
Complete and/or fragmentary backed artefacts will dominate the retouched components of recorded flaked stone artefact assemblages	The results of the archaeological survey support this prediction.
The majority of silcrete artefacts will exhibit evidence of thermal alteration	The results of the archaeological survey support this prediction.
Scarred trees may occur where original remnant vegetation remains	The results of the archaeological survey support this prediction.

[17] ie., complete loss of potential artefact-bearing topsoils.

7.8 Summary of Results

A summary of the key findings of the program of archaeological survey undertaken within the study area is provided below:

- A total of 275 Aboriginal archaeological sites, comprising 274 open artefact sites (i.e., artefact scatters and isolated artefacts) and one stone quarry have been identified within the study area. These include 228 previously recorded AHIMS sites and 47[18] new sites recorded during the current survey.
- A total of 545 individual stone surface artefacts were recorded during the archaeological survey. The assemblage is dominated by flake debitage items (76.5%) comprising complete flakes (n=242, 44.4%), flake shatter (n=150, 27.5%), proximal flakes (n=17, 3.1%) and split flakes (n=8, 1.5%). Non-flake debitage items (i.e., angular shatter) make up the next largest portion of the assemblage (n=73, 13.4%). Formed objects (i.e, tools, cores) make up the remainder of the assemblage with retouched flakes (n=4, 0.7%), complete and broken cores (n=40, 7.3%), axes (n=9, 1.6%) and choppers (n=2, 0.4%).
- The most common raw material recorded was silicified tuff (n=369, 67.9%), followed by silcrete (n=116, 21.1%), chert (n=17, 3.1%), quartz (n=14, 2.6%), porcellanite (n=9, 1.7%), basalt (n=6, 1.1%), FGS other (n=8, 1.5%), quartzite (n=5, 0.9%), and volcanic (n=1, 0.2%).
- Combined with the results of the AECOM (2012) a total of approximately 4,018 surface artefacts have been identified within the current study area.
- An Aboriginal stone quarry site comprising a naturally occurring outcrop of silcrete cobbles has been identified within the study area (37-2-1954).
- The majority of surface artefacts (79.4%, n=3,192) were identified within 100 m of a watercourse.
- The majority of surface artefacts (58.7%, n=2,359) were identified associated with a 1st order watercourse.
- The largest counts of surface artefacts (47.01%, n=1,889) were identified on the lower slope landform followed by flats (30.96%, n=1,244).

7.9 Discussion

As indicated in Section 7.1.1, the overarching objective of the survey undertaken for the current investigation was to collect information about the nature and extent of surface Aboriginal objects across the study area and to assess levels of subsurface archaeological sensitivity. The results of this the assessment are discussed below.

The current investigation has enhanced our understanding of Aboriginal site patterning and occupation on a local scale and has provided an important dataset for guiding the management of the study area's known and potential Aboriginal archaeological resource. Environmental and archaeological biases notwithstanding, the identification of numerous Aboriginal archaeological sites within the study area attests to a widespread Aboriginal presence in the past.

While acknowledging issues surrounding ground surface visibility across the study area, the overall pattern of surface artefact distribution revealed during the survey is one suggestive of variability in Aboriginal use of the study area with an emphasis on the utilisation of land adjacent to creeklines (i.e., creek flats and lower slopes) in all parts of the study area. Densities of artefacts across the area range from what Douglas and McDonald (1993) have described as "background scatter", being "artefactual material which is insufficient in number or in association with other material to suggest focussed activity in a particular location", and might reasonably be interpreted as products of small-scale or limited episodes of lithic discard (sensu Jo McDonald CHM, 2005: 129-30) to higher densities indicating knapping events associated with longer term usage or multiple visitations.

[18] Note, six additional sites were recorded outside the study area during the archaeological survey (37-2-5895, 37-2-5894, 37-2-5898, 37-2-5850, and 37-2-5873, 37-2-5863)

The Hunter River and Saddlers Creek, in particular, would have been focal resource areas for Aboriginal people occupying the study area and greater Muswellbrook area more broadly, facilitating sustained and/or intensive occupation over thousands of years. Collectively, the character of the flaked stone artefact assemblages associated with newly and previously identified open artefacts adjacent to these watercourses are suggestive of what Shiner (2008), following Schlanger (1992), has described as a 'persistent place'. Persistent places, as articulated by Schlanger (1992), are created through two basic mechanisms, the first being when a particular landscape segment possesses a quality that attracts repeated human activity over time, for example, a watercourse or knappable stone source, the second, being the structuring[19] of future landscape use through human creations and/or environmental modifications. Such places may be functionally dynamic through time and need not attract permanent settlement, the alternative being long-term episodic use.

In common with other local stone artefact assemblages, both surface recorded and excavated, the cultural lithic assemblage identified across the study area attests to an emphasis on the procurement and reduction of both local and non-local lithic raw materials, principally locally sourced silicified tuff and silcrete, but also other materials such as FGS (local), quartz (local), quartzite (local) and porcellanite (non-local). The presence of an Aboriginal stone quarry site, consisting of naturally occurring outcrop of silcrete and chert cobbles within the study area (37-2-1954) (impacts avoided by the Project - Section 9), suggests that Aboriginal people may have visited the area for the purpose of obtaining and utilising this resource. The presence of thermally altered artefacts and heat shatters within the assemblage, meanwhile, is suggestive of two processes: unintentional post-discard burning and deliberate heat treatment to improve flaking quality. Both phenomena are well represented in the archaeological record of the Hunter Valley.

Backed artefacts, many of which have been identified within the study area, are a near-ubiquitous element of the stone artefact record of the Hunter Valley and likely served as multifunctional tools in pre-contact times, with existing residue and use-wear data for this implement type (e.g., McDonald et al. 2007; Fullagar et al. 2009; Robertson et al. 2009; Robertson 2011) suggesting that they 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. In south-eastern Australia, backed artefacts are known to have been produced as early as 8,500 years BP (Attenbrow & Hiscock 1998). However, between *c.*3500 BP and 1500 BP, they were manufactured and discarded in large quantities across numerous sites - the so called "backed artefact proliferation event" (Hiscock 2002). Research into this phenomenon, spearheaded by Hiscock (1994, 2002), has identified the onset of an El Niño Southern Oscillation (ENSO)-dominated climatic pattern 4,000 to 5,000 years ago as a key causal trigger, with increased backed artefact manufacture interpreted as one of number of technological strategies employed by Aboriginal people to reduce subsistence risks incurred by increased climatic variability.

In the absence of absolute dates obtained through controlled archaeological excavation and/or a detailed geoarchaeological investigation, establishing a chronological context for the identified surface Aboriginal archaeological resource of the study area is difficult. As in other contexts (e.g., Fanning et al. 2008, 2009; Shiner 2008), establishing the temporal history of the various soil units present within the study area will prove crucial to ascertaining the antiquity of the Aboriginal archaeological materials within it, both in surface and subsurface contexts. In view of the now well documented difficulties associated with the dating of detrital charcoal from the heavily bioturbated A soil horizons of texture contrast soil profiles (e.g., Dean-Jones & Mitchell 1993), the identification and dating of features of undoubted or probable anthropogenic origin (e.g., hearths, heat treatment pits) will likewise prove critical.

[19] Through re-use or avoidance.

Although limited in respect to the chronological resolution that it offers, the technological and typological character of the stone artefact assemblage identified during survey offers some insight into the antiquity of Aboriginal occupation within the study area. As highlighted in Section 6.1, McCarthy's (1967) ERS of stone artefact assemblages remains, with some modification, the dominant chronological framework for Aboriginal occupation of the Hunter Valley. 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, and the presence/absence of edge-ground hatchet-heads are also relevant.

While acknowledging the interpretive difficulties posed by the so-called 'palimpsest problem', technological and typological affinities between the stone artefact assemblage identified during the current survey (which includes both Bondi points and edge-ground hatched heads/axes) and other Hunter Valley assemblages, some of which have associated radiometric dates, are suggestive of a broad Middle to Late Bondaian date (i.e., 4000 BP to European contact).

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 22). 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 22 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 r*epresentativeness* 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 region[20]. 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 substantiative subjects?

Several criteria can be used to assess the research potential of an archaeological site. Particularly important in the context of Aboriginal archaeology are the intactness or integrity of the site in question, its complexity and its potential for archaeological deposit (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).

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.

[20] 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).

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 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 study area has been obtained through a review of existing environmental and archaeological data for the study area, as detailed in Sections 4.0 and archaeological survey across the study area described in Section 7.2.

8.2.4 Assessment of Scientific Significance

An assessment of the scientific significance of all sites within the study area is presented in Table 23 below and shown on Figure 23. 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. In some instances, significance values have been reassessed from those assigned as part of the AECOM 2012/2015 assessments due to additional sites being identified within the study area and new information being available regarding the archaeological values of the region.

Table 23 Scientific significance assessment

Site	Type	Rarity	Representative-ness	Integrity	Complexity	PAD	Research potential	Overall Significance
37-2-1954	Quarry	H	H	M	M	M	M	High
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
37-2-0080	Artefact scatter	L	L	L	L	L	L	Low
37-2-0082	Artefact scatter	L	L	L	L	L	L	Low

Site	Type	Rarity	Representative-ness	Integrity	Complexity	PAD	Research potential	Overall Significance
37-2-0089	Artefact scatter	L	L	L	L	L	L	Low
37-2-0090	Artefact scatter	L	L	L	L	L	L	Low
37-2-0362	Artefact scatter + PAD	L	L	L	L	M	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
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

Site	Type	Rarity	Representative-ness	Integrity	Complexity	PAD	Research potential	Overall Significance
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
37-2-0505	Artefact scatter + PAD	M	M	M	M	M	M	Moderate
37-2-1923	Artefact scatter	L	L	L	L	L	L	Low
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
37-2-1931	Artefact scatter	L	L	L	L	L	L	Low
37-2-1932	Artefact scatter	L	L	L	L	L	L	Low
37-2-1933	Artefact scatter + PAD	L	L	L	L	M	L	Low
37-2-1934	Artefact scatter + PAD	L	L	L	L	M	L	Low
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

Site	Type	Rarity	Representative-ness	Integrity	Complexity	PAD	Research potential	Overall Significance
37-2-1956	Artefact scatter	L	L	L	L	L	L	Low
37-2-1957	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
37-2-2329	Artefact scatter	L	L	L	L	L	L	Low
37-2-2330	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
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

Site	Type	Rarity	Representative-ness	Integrity	Complexity	PAD	Research potential	Overall Significance
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
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

Site	Type	Rarity	Representative-ness	Integrity	Complexity	PAD	Research potential	Overall Significance
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
37-2-4303	Artefact scatter + PAD	M	L	L	M	M	M	Moderate
37-2-4307	Artefact scatter	L	L	L	L	L	L	Low
37-2-4310	Artefact scatter	L	L	L	L	L	L	Low
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
37-2-4317	Artefact scatter	L	L	L	L	L	L	Low
37-2-4318	Artefact scatter	L	L	L	L	L	L	Low
37-2-4327	Artefact scatter	L	L	L	L	L	L	Low
37-2-4328	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

Site	Type	Rarity	Representative-ness	Integrity	Complexity	PAD	Research potential	Overall Significance
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
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
37-2-4359	Artefact scatter	L	L	L	L	L	L	Low
37-2-4361	Artefact scatter	L	L	L	L	L	L	Low
37-2-4362	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
37-2-4376	Artefact scatter	L	L	L	L	L	L	Low
37-2-4377	Artefact scatter	L	L	L	L	L	L	Low
37-2-4378	Artefact scatter	L	L	L	L	L	L	Low
37-2-4379	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

Site	Type	Rarity	Representative-ness	Integrity	Complexity	PAD	Research potential	Overall Significance
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
37-2-5016	Artefact scatter	L	L	L	L	L	L	Low
37-2-5022	Artefact scatter	L	L	L	L	M	L	Low
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
37-2-5470	Artefact scatter	L	L	L	L	L	L	Low
37-2-5787	Artefact scatter	L	L	L	L	L	L	Low
37-2-5848	Isolated artefact	L	L	L	L	L	L	Low
37-2-5849	Isolated artefact	L	L	L	L	L	L	Low
37-2-5883	Isolated artefact	L	L	L	L	L	L	Low
37-2-5861	Isolated artefact	M	L	L	L	L	L	Low
37-2-5897	Isolated artefact	L	L	L	L	L	L	Low
37-2-5896	Isolated artefact	L	L	L	L	L	L	Low
37-2-5893	Isolated artefact	L	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
37-2-5890	Isolated artefact	M	L	L	L	L	L	Low
37-2-5889	Isolated artefact	L	L	L	L	L	L	Low
37-2-5888	Isolated artefact	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
37-2-5868	Isolated artefact	L	L	L	L	L	L	Low
37-2-5884	Isolated artefact	L	L	L	L	L	L	Low
37-2-5851	Isolated artefact	L	L	L	L	L	L	Low
37-2-5852	Isolated artefact	L	L	L	L	L	L	Low
37-2-5854	Isolated artefact	L	L	L	L	L	L	Low
37-2-5853	Isolated artefact	L	L	L	L	L	L	Low
37-2-5840	Artefact scatter	L	L	L	L	L	L	Low

Site	Type	Rarity	Representative-ness	Integrity	Complexity	PAD	Research potential	Overall Significance
37-2-5841	Artefact scatter	L	L	L	L	L	L	Low
37-2-5842	Artefact scatter	L	L	L	L	L	L	Low
37-2-5885	Artefact scatter	L	L	L	L	L	L	Low
37-2-5882	Artefact scatter	L	L	L	L	L	L	Low
37-2-5843	Artefact scatter	L	L	L	L	L	L	Low
37-2-5881	Artefact scatter	L	L	L	L	L	L	Low
37-2-5880	Artefact scatter	L	L	L	L	L	L	Low
37-2-5879	Artefact scatter	L	L	L	L	L	L	Low
37-2-5878	Artefact scatter	L	L	L	L	L	L	Low
37-2-5877	Artefact scatter	L	L	L	L	L	L	Low
37-2-5876	Artefact scatter + PAD	M	L	L	L	M	L	Low
37-2-5875	Artefact scatter + PAD	L	L	L	L	M	L	Low
37-2-5874	Artefact scatter	M	L	L	L	L	L	Low
37-2-5872	Artefact scatter	M	L	L	L	L	L	Low
37-2-5871	Artefact scatter	M	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
37-2-5867	Artefact scatter	L	L	L	L	L	L	Low
37-2-5866	Artefact scatter	L	L	L	L	L	L	Low
37-2-5865	Artefact scatter + PAD	L	L	L	M	M	L	Low
37-2-5864	Artefact scatter	L	L	L	L	L	L	Low
37-2-5844	Artefact scatter	L	L	L	L	L	L	Low
37-2-5845	Artefact scatter	L	L	L	L	L	L	Low
37-2-5846	Artefact scatter	L	L	L	L	L	L	Low
37-2-5847	Artefact scatter	L	L	L	L	L	L	Low
37-2-5862	Artefact scatter + PAD	M	L	L	M	M	M	Moderate

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 assessment is provided below with greater detail provided in the CVR (Appendix A).

8.3.1 Cultural Landscape

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 are important landscape features, such as, Mount Arthur, the Hunter River, and Saddlers Creek which surround the study area, as well as the Aboriginal objects (i.e., stone artefacts) identified during the archaeological survey for the Project. Landscape features, as well as Aboriginal sites, are often associated with stories or songs and form links along songlines or pathways. More broadly, the study 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 (2012, 2015) as well as the current assessment highlighted Mount Arthur, located 4.5 km north of the study area, the Hunter River located south of the study area and Saddlers Creek on the northern boundary of the 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 Dyall (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 (Section 8.3.3). 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.

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 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 (c. 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).

Further discussion on this is provided in the CVR in Appendix A.

8.3.4 Vegetation

RAPs suggested that prior to European settlement, the native vegetation communities of the study area 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 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 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 study area and would not be impacted by the Project.

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 study area itself is assessed as having low historical significance. No evidence of post-contact Aboriginal occupation has been identified within the study area, neither 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 study area include Mount Arthur, the Hunter River and Saddlers Creek, all of which are located outside the study area. While the majority of identified sites located within the study area do not have views of these features, selected sites do.

Views to and from the surrounding region would largely be unaffected by the Project due to it being largely located underground. Visual corridors between locally and regionally significant features that may form part of Aboriginal pathways or Songlines would likewise not be significantly impacted.

8.6 Statement of Significance

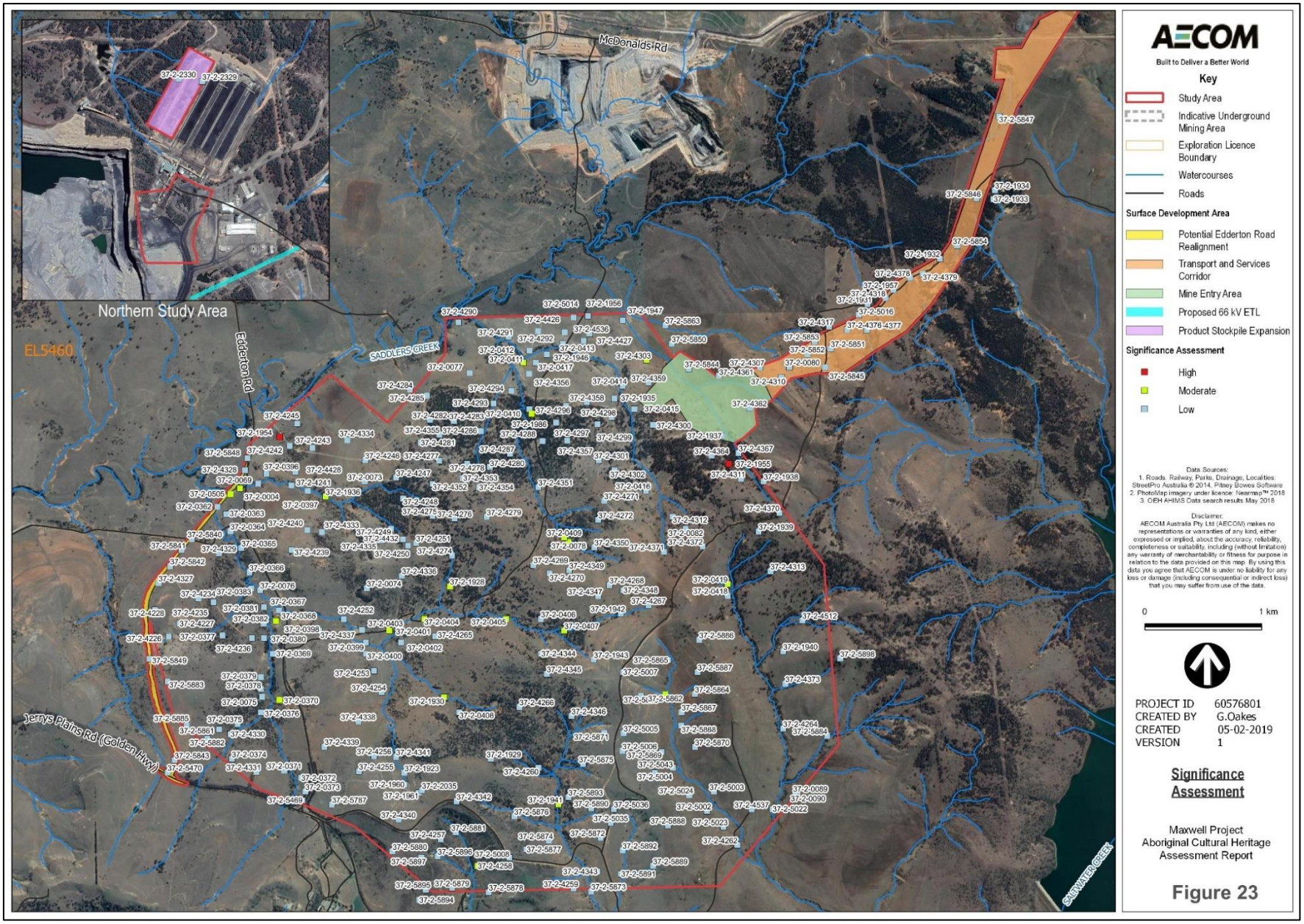
This assessment finds that the Aboriginal heritage values of the study area rest principally with the archaeological sites identified within it but also are drawn from its place within the broader cultural landscape. Identified archaeological sites within the study area attest to its past use by Aboriginal people with these sites identified by RAPs as all highly significant. The locations and densities of surface artefacts/sites across the study area 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 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. Twenty sites within the study area have been assessed as of moderate scientific significance with flaked stone artefact assemblages from these locations interpreted as palimpsests[21] 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 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.

[21] Palimsests generally refer to deposits that lack clear stratigraphic relationships and or where the deposit is scrambled.

More broadly, the 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 study area was likely utilised by people travelling to and from Mount Arthur from the south and is visible from multiple locations within the study area. Likewise, both the Hunter River and Saddlers Creek were likely accessed in places from within the 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 study area and are considered to hold aesthetic significance.

Although situated within a broader landscape of high historical significance for contemporary Aboriginal people, the 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 oral histories specific to the use of the site by Aboriginal people have been identified as part of this assessment.

Figure 23 Significance Assessment



9.0 Impact Assessment

9.1 Summary of Proposed Impacts

As described in Section 1.2, the Project would extract coal through underground mining methods over a period of approximately 26 years. The underground mining area would be located entirely within EL 5460 (Figure 1). The Project would utilise the existing Maxwell Infrastructure plus require the development of some new infrastructure. Coal when mined would be transferred to existing coal handling, processing and train load-out facilities at the Maxwell Infrastructure prior to dispatch to markets.

The Project would include a number of key components, some of which require surface disturbance, including the mine entry area, transport and services corridor, realignment of Edderton Road, other works and ancillary infrastructure. As well as ground surface impacts from surface development, there is potential for subsidence-related impacts to sites located within the underground mining area.

9.2 Impacts to Identified Aboriginal Sites

As discussed in Section 7.4, a total of 275 Aboriginal archaeological sites, comprising 274 open artefact sites (i.e., artefact scatters and isolated artefacts) and one stone quarry have been identified within the study area.

It is noted that stone quarry sites SC-QS-1 (37-2-1955, not located) and SC-QS-2 (37-2-1954) assessed as having high significance would not be directly impacted by the Project.

9.2.1 Surface Development

Consideration of the location of sites located directly within surface development areas indicates that up to 39 open artefact sites would be wholly or partially impacted by construction of surface development associated with the Project. Table 24 presents a list of impacted sites.

Table 24 Impacted sites

Site number	Site type	Significance	Type of harm	Degree of harm	Consequence of harm
37-2-0004	Open artefact site	Moderate	Direct harm	Part	Partial loss of value
37-2-0080	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-0362	Open artefact site	Low	Direct harm	Part	Partial loss of value
37-2-0505	Open artefact site	Moderate	Direct harm	Part	Partial loss of value
37-2-1931	Open artefact site	Low	Direct harm	Part	Partial loss of value
37-2-1932	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-1933	Open artefact site	Low	Direct harm	Part	Partial loss of value
37-2-1934	Open artefact site	Low	Direct harm	Part	Partial loss of value
37-2-1937	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-1957	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-2329	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-2330	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-4307	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-4310	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-4317	Open artefact site	Low	Direct harm	Part	Partial loss of value
37-2-4318	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-4328	Open artefact site	Low	Direct harm	Whole	Total loss of value

Site number	Site type	Significance	Type of harm	Degree of harm	Consequence of harm
37-2-4361	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-4362	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-4376	Open artefact site	Low	Direct harm	Part	Partial loss of value
37-2-4377	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-4378	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-4379	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-5016	Open artefact site	Low	Direct harm	Part	Partial loss of value
37-2-5470	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-5840	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-5841	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-5842	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-5843	Open artefact site	Low	Direct harm	Part	Partial loss of value
37-2-5844	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-5845	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-5846	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-5847	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-5848	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-5849	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-5851	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-5852	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-5854	Open artefact site	Low	Direct harm	Whole	Total loss of value
37-2-5853	Open artefact site	Low	Direct harm	Whole	Total loss of value

9.2.2 Underground Mining

Consideration of the location of Aboriginal sites located within proposed underground mining areas indicates that 238 sites, comprising 237 open artefact sites and one stone quarry, are located directly above the proposed underground mining area. Of these, two are located within areas of proposed surface development as well as being located above the proposed underground mining area and as such would be directly impacted (37-2-1937 and 37-2-0004 included in direct impact assessment above). For those sites located outside surface development areas but within proposed underground mining areas, it is noted that these sites may potentially be affected by cracking of the surface soils due to the effects of mining-induced subsidence.

The subsidence assessment completed for the Project (Mine Subsidence Engineering Consultants, 2019) suggests that based on the previous longwall mining experience in the NSW coalfields, 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 for the Project. 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 (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.

The subsidence assessment for the Project, completed by (Mine Subsidence Engineering Consultants, 2019) assessed the potential for subsidence impacts on Aboriginal sites . Site SC-QS-2 and the previously recorded location of the Site SC-QS-1 (not located) would not experience any measurable subsidence. Results of the assessment are provided in Appendix M.

Although considered unlikely, there is some potential for impacts to Aboriginal sites from subsidence or remediation of surface cracks. Therefore, Sections 10.0 and 11.0 present proposed management for these sites.

9.3 Impacts to Cultural Values

Three culturally significant landscape features have been identified by RAPs as relevant to the study area, including Mount Arthur, the Hunter River and Saddlers Creek. All three features are located outside the study area and would not be directly impacted by the Project. However, views of the mine entry area and portions of the transport and services corridor would be visible from both Mount Arthur and Saddlers Creek. Nonetheless, consideration of the small size of the mine entry area and the transport and services corridor, suggests these visual impacts would be minor, particularly when considering the views on offer of large open cut mines north of the study area from both Mount Arthur and Saddlers Creek. Visual impacts to the Hunter River would be fully avoided with the mine entry area and transport and services corridor not visible from any location on the Hunter River.

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 OEH'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 OEH 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 OEH 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 study area with that of the surrounding region (study region), defined here as an arbitrary 20 x 20 km (400 km^2) area roughly centred on the study area; 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 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, 39 previously identified open artefact sites will be subject to direct impacts, either fully or partially, from proposed surface development. Impacts to identified sites as a result of mining-induced subsidence are also possible. AHIMS data obtained from the OEH on 11 May 2018 indicate that the 39 directly impacted sites represent 2.4% of the valid extant open artefact resource of the study region, with searches of the AHIMS database returning 1,594 '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, 37 of which have been assessed as being of low scientific significance and two of moderate significance, alongside a consideration that the majority of land within this region has not been physically inspected for Aboriginal sites suggests that impact of this Project is 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 study area is also a useful guide. For the present analysis, land use data (dated 2017) obtained from the Land Assessment Unit at OEH was utilised (Table 25).

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 25. 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 25 Land use analysis for study region (20 x 20 km)

Existing Land Use	Km²	%	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**	**99.9**	

Source: NSW Landuse Data 2017 obtained from OEH.

Viewed from an Aboriginal archaeological perspective, the results of the land use analysis presented in Table 25 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 proposed development on the potential open artefact resource of the study region it is necessary to compare the amount of land directly impacted by surface development with the potential for open artefact sites within the study area (i.e., 0.52 km² = areas of high sensitivity) with that available in the search area (*c*.289.5 km²). On this basis, it can be stated that the Project will result in an approximate 0.18% decline in the region's potential open artefact resource. As such, it can be concluded that the impact of the Project on the potential Aboriginal archaeological resource of the region would not be significant.

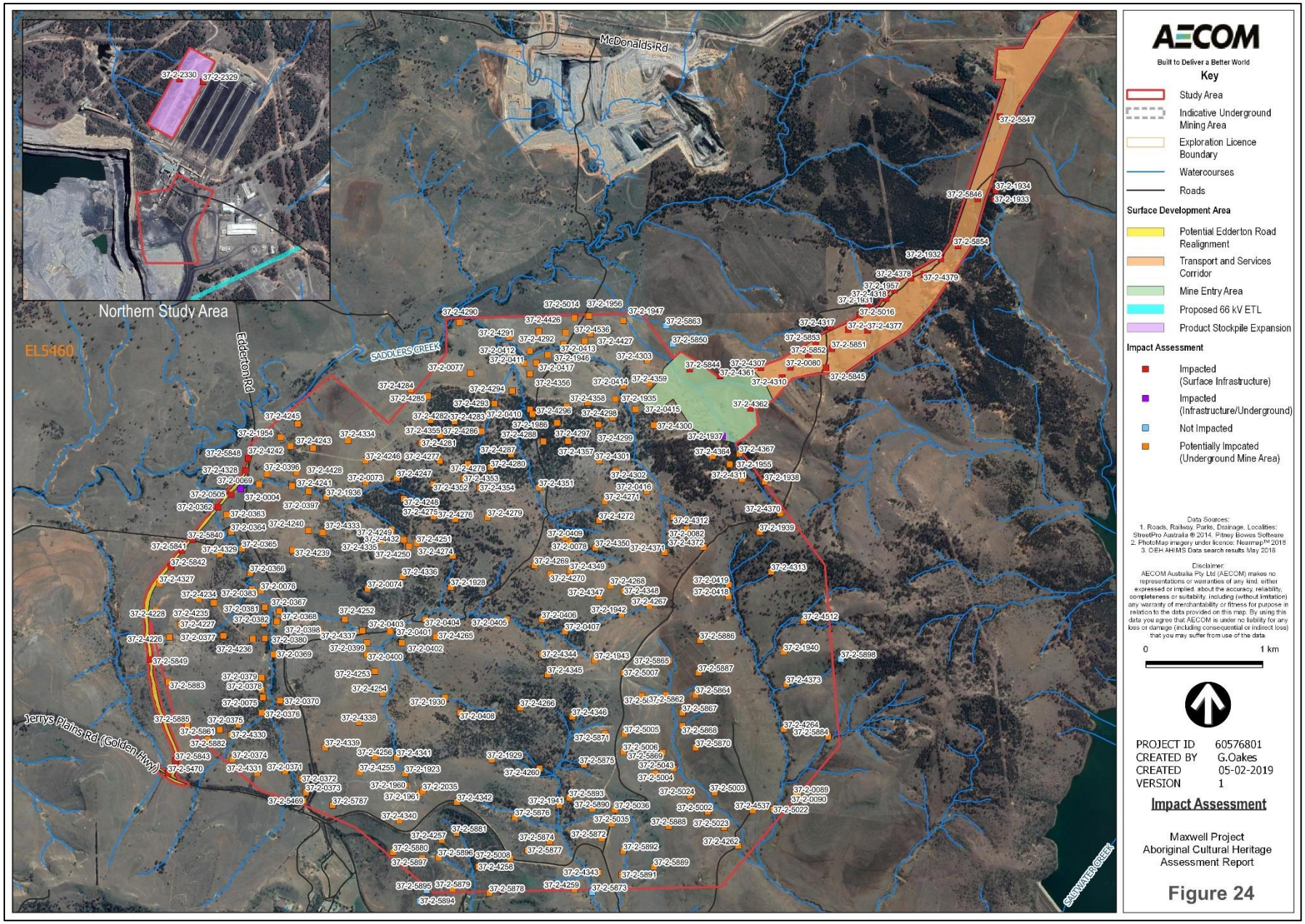
With regards to the existence, outside of the study area, of environmental contexts that have the potential to contain sites comparable to those identified within it, an examination of relevant topographic maps for the study region indicates that many such contexts exist, including unmodified sections 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 current 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 study area and that this approach is reflected in our proposed management strategy.

Figure 24 Impact Assessment



10.0 Avoiding and Minimising Harm

As part of its acquisition of 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 would also use the substantial existing Maxwell Infrastructure, which would avoid the need to develop additional infrastructure required to support an underground mining operation within EL 5460.

The location of mine entry area for the Project was selected in consideration of:

- locating the mine entry area away from sensitive receptors, and in a natural valley that mitigates and minimises alteration of the visual landscape (particularly from sensitive viewsheds); and
- minimising the length of underground roadways required to access the coal seams.

Moreover, the Project mine 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).

In relation to Aboriginal heritage values, archaeological survey across the study area has identified a total of 275 Aboriginal archaeological sites, comprising 274 open artefact sites (i.e., artefact scatters and isolated artefacts) and one stone quarry, all of which were or have been registered on the OEH's AHIMS database. As indicated in Section 9.0, proposed impacts from surface development within the study area are anticipated to directly impact, wholly or partially, 39 Aboriginal sites. Of the impacted sites, 37 have been assessed as of low scientific significance and two of moderate significance. It is noted that stone quarry sites SC-QS-1 (37-2-1955, not located) and SC-QS-2 (37-2-1954) assessed as having high significance would not be directly impacted by the Project. Avoidance of impacts to all previously and newly identified Aboriginal sites within the study area from surface development is not feasible given the respective locations of these sites in relation to the proposed development. However, potential impacts have reduced through critical placement of surface infrastructure.

Significant impacts to Aboriginal sites from underground mining activities are not expected likely, with soil cracking as a result of subsidence expected to be typically between 25 mm and 50 mm across much of the study area where Aboriginal sites are present. Based on experience at similar operations less than 0.02 % of the surface area above the underground will be affected by surface cracking (Mine Subsidence Engineering Consultants, 2019).

Three culturally significant landscape features have been identified by RAPs as relevant to the study area, including Mount Arthur, the Hunter River and Saddlers Creek. All three features are located outside the study area and would not be directly impacted by the Project. However, views of the mine entry area and portions of the transport and services corridor would be visible from both Mount Arthur and Saddlers Creek. Nonetheless, consideration of the small size of the mine entry area and the transport and services corridor, suggests these visual impacts would be minor, particularly when considering the views on offer of large open cut mines north of the study area from both Mount Arthur and Saddlers Creek. Visual impacts to the Hunter River would be fully avoided with the mine entry area and transport and services corridor not visible from any location on the Hunter River.

Areas of high subsurface archaeological sensitivity within the study area were identified in association with watercourses, flats and lower slopes. These areas were assessed, on the basis of the results of the archaeological survey, field observations, RAP field comments and existing local and regional archaeological data, as retaining a high potential for the presence of subsurface archaeological deposit(s). However, as noted above and in Section 7.6 the proposed placement of surface development has avoided bulk of these areas and is predominately located in areas assessed of as low archaeological sensitivity.

In view of the above, management strategies to minimise harm to the identified heritage values of the study area are required. These strategies, which include a recommendation for an archaeological salvage program for all directly impacted sites, are detailed in Section 11.0.

11.0 Management Recommendations

The following management recommendations are made regarding the identified Aboriginal heritage values of the study area, with recommendations made on the basis of:

- a review of previous archaeological investigations completed within and surrounding the 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 Registered Aboriginal Parties (RAPs).

11.1 Statutory Requirements

As indicated in Section 1.0, this Aboriginal archaeology and cultural heritage impact assessment forms part of an EIS, which is being prepared to support a Development Application for the Project in accordance with Part 4 of the EP&A Act.

This ACHAR documents the results of AECOM's assessment and has been compiled with reference to the NSW Office of Environment and Heritage'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).

11.2 Management Strategy

This assessment has identified Aboriginal heritage constraints across the study area including 275 Aboriginal archaeological sites, comprising 274 open artefact sites (i.e., artefact scatters and isolated artefacts) and one stone quarry. The impact assessment undertaken in Section 9.0 has identified that up to 39 open artefact sites would be directly impacted by the proposed surface development and additional sites may be impacted by the effects of mine-related subsidence.

Archaeological test excavation was not considered warranted for the assessment of sites directly impacted by the Project as robust significance assessments and associated management strategies were deemed possible on surface evidence alone. Moreover, the majority of land to be impacted directly by surface development has been assessed as having low subsurface sensitivity.

A management strategy to address the impacts of the Project on the known and potential Aboriginal archaeological resource of the study area is provided below. It is recommended that this strategy be included in an Aboriginal Cultural Heritage Management Plan (ACHMP) for the Project, prepared in consultation with RAPs, and to the satisfaction of the OEH and the DP&E. Subject to the grant of a Development Consent under Part 4 of the EP&A Act, this ACHMP will guide the management of the known and potential Aboriginal archaeological resource of the Project area, as well as identified cultural values.

11.2.1 Archaeological Salvage Program

An archaeological salvage program for all sites impacted by surface development should be undertaken for the Project prior to the commencement of any ground disturbance within the study area and following approval of the Development Consent. The salvage program should be undertaken progressively, in line with the progression of surface disturbance. The salvage program should incorporate the following components:

- Surface collection of all aboriginal objects/sites impacted by surface development. Surface collection is considered an appropriate and effective mitigation option for these sites given their content and level of scientific significance. Section 11.3 provides a list of sites to be surface collected.

A program of open area salvage excavation as detailed in Appendix N should be undertaken for sites 37-2-0004 and 37-2-0505 (these sites lie within 100m of each and essentially comprise a single archaeological site) representing the only sites assessed of moderate scientific significance directly impacted by proposed surface development. The overarching objectives of the salvage program would be as follows:

- to salvage a representative and statistically viable subsurface assemblage of stone artefacts from 37-2-0004/37-2-0505 prior to impacts;
- 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 study though 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. Post-salvage work for the excavation component of the archaeological salvage program should, at minimum, include:

- the analysis and cataloguing of all recovered Aboriginal objects (e.g., stone artefacts, hearth stones) by a suitably qualified person or persons;
- the submission, where deemed appropriate by a qualified archaeologist and/or geomorphologist, of excavated charcoal samples for conventional or Accelerator Mass Spectrometry (AMS) radiocarbon dating;
- the submission, where deemed appropriate by a qualified geomorphologist, of excavated sediment samples for OSL dating;
- the submission, where deemed appropriate by a qualified archaeologist, of a selection of stone artefacts for functional use-wear/residue analysis; and
- the submission, where deemed appropriate by a qualified archaeologist, of a selection of non-artefactual rock samples to a qualified geologist for the purposes of raw material identification.

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.

Aboriginal Site Impact Recording (ASIR) forms for all salvaged sites should be submitted to the OEH at the completion of the salvage program.

11.2.2 Conservation of Non-impacted Sites

All Aboriginal sites not impacted by the Project but within the 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 should be incorporated into the ACHMP.

11.2.3 Subsidence Monitoring

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 study area recorded. 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 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.

11.2.4 Aboriginal Cultural Heritage Awareness Training

An Aboriginal cultural heritage awareness training package should be developed for use throughout the life of the Project, as part of either the induction or ground disturbance permit process.

11.2.5 Previously Unrecorded Aboriginal Archaeological Evidence

Provisions regarding the appropriate management action(s) for previously unrecorded Aboriginal archaeological evidence identified within the study area throughout the operational life of the Project should be incorporated into the ACHMP. Management action(s) will vary according to the type of evidence identified its significance (both scientific and cultural) and the nature of potential impacts.

The unanticipated finds protocol should include the following steps if an Aboriginal object is identified or harmed:

1. Immediately cease all work at the particular location.
2. Secure the area to avoid further harm to the Aboriginal object.
3. Seek advice from a qualified archaeologist on appropriate management considering the nature, type and significance of the object.
4. Should it be determined the object is Aboriginal, it should be registered on the OEH's AHIMS database as soon as practicable.
5. The following management should apply for previously unrecorded objects identified within the study area:
    a. **Open artefact sites** (i.e., isolated artefacts and artefact scatters) assessed of low significance subject to Project related direct surface impacts (i.e., excluding subsidence related impacts) should be subject to surface collection. Sites assessed of moderate significance should be subject to surface collection and other forms of mitigation (i.e., detailed recording, test or open area excavation), regardless of impact type (i.e., including direct surface and subsidence related). Management of sites assessed of high significance would be determined through consultation with Malabar and RAPs;
    b. **Scarred trees** identified within the study area subject to project related impacts would be managed through discussions between a qualified archaeologist, Malabar and RAPs and may include removal and relocation;
    c. **Grinding grooves** identified within the study area subject to project related impacts would be managed through discussions between a qualified archaeologist, Malabar and RAPs and may include removal and relocation;
    d. **Other sites** (i.e., stone quarries, ochre quarries, stone arrangements, engravings) identified within the study area subject to project related impacts would be managed through discussions between a qualified archaeologist, Malabar and RAPs.
6. A record of the find and management completed should be included in annual reporting.
7. If the site is within the surface development area (i.e., would be impacted), an ASIR form would be completed and submitted to OEH, prior to disturbance.

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 following standard procedure (New South Wales Police Force 2015; NSW Health 2013) should be followed.

1. all work in the vicinity of the remains should cease immediately;
2. the location should be cordoned off - work can continue outside of this 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 Project Manager (or a delegate) should inform the NSW Police by telephone (prior to seeking advice from a forensic specialist);
4. where uncertainty over the origin (i.e., human or non-human) of the remains exists, a physical or forensic anthropologist should 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, notify NSW Police;
6. if the remains are identified as pre-contact or historic Aboriginal, notify the OEH using their Environment Line (131 555); and
7. if the remains are identified as historic (non-Aboriginal), notify the NSW Heritage Division.

An Aboriginal community representative must 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 must be notified immediately.

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 must 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.

11.2.7 AHIMS Site Cards

AHIMS site cards have been completed and submitted to the OEH for all newly recorded sites within the study area.

In the event that a previously unidentified Aboriginal site is discovered within the study area at any point during the operational life of the Project, an AHIMS site card for that site should be submitted to the OEH as promptly as possible. Timing protocols for the submission of AHIMS site cards should be included in the ACHMP for the Project.

11.2.8 Aboriginal Site Database

A comprehensive Aboriginal Site Database for the study area and its immediate environs should be established upon commencement of the Project. Malabar would be responsible for the creation and maintenance of this database which will, at a minimum, contain the name, type, size (where applicable), MGA coordinates and status of all Aboriginal sites within and directly adjacent to the study area. The database should be regularly updated throughout the operational life of Maxwell Project. Printed site lists and maps should be made available to RAPs upon request.

11.3 Summary of Management Mitigation Measures

Table 26 presents a summary of management mitigation measures for identified Aboriginal sites within the study area.

Table 26 Summary of mitigation measures

Site	Type	Significance	Impacts	Management
37-2-1954	Quarry	High	Not measurable	Monitoring. If impacted, salvage excavation
37-2-1955	Quarry	High	Not measurable	Not relocated
37-2-0004	Artefact scatter + PAD	Moderate	Direct	Surface collection & salvage excavation
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
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
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

Site	Type	Significance	Impacts	Management
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
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

Site	Type	Significance	Impacts	Management
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
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	Potential subsidence	Surface collection if soil remediation required
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
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
37-2-1932	Artefact scatter	Low	Direct	Surface collection
37-2-1933	Artefact scatter + PAD	Low	Direct	Surface collection
37-2-1934	Artefact scatter + PAD	Low	Direct	Surface collection
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

Site	Type	Significance	Impacts	Management
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
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
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	Direct	Surface collection
37-2-2330	Artefact scatter	Low	Direct	Surface collection
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

Site	Type	Significance	Impacts	Management
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
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

Site	Type	Significance	Impacts	Management
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	Direct	Surface collection
37-2-4307	Artefact scatter	Low	Direct	Surface collection
37-2-4310	Artefact scatter	Low	Direct	Surface collection
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
37-2-4317	Artefact scatter	Low	Direct	Surface collection
37-2-4318	Artefact scatter	Low	Direct	Surface collection
37-2-4327	Artefact scatter	Low	Potential subsidence	Surface collection if soil remediation required
37-2-4328	Artefact scatter	Low	Direct	Monitoring. If impacted, surface collection
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

Site	Type	Significance	Impacts	Management
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
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
37-2-4362	Artefact scatter	Low	Direct	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

Site	Type	Significance	Impacts	Management
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
37-2-4377	Artefact scatter	Low	Direct	Surface collection
37-2-4378	Artefact scatter	Low	Direct	Surface collection
37-2-4379	Artefact scatter	Low	Direct	Surface collection
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
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
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

Site	Type	Significance	Impacts	Management
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
37-2-5787	Artefact scatter	Low	Potential subsidence	Surface collection if soil remediation required
37-2-5848	Isolated artefact	Low	Direct	Surface collection
37-2-5849	Isolated artefact	Low	Direct	Surface collection
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
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
37-2-5852	Isolated artefact	Low	Direct	Surface collection
37-2-5854	Isolated artefact	Low	Direct	Surface collection
37-2-5853	Isolated artefact	Low	Direct	Surface collection

Site	Type	Significance	Impacts	Management
37-2-5840	Artefact scatter	Low	Direct	Surface collection
37-2-5841	Artefact scatter	Low	Direct	Surface collection
37-2-5842	Artefact scatter	Low	Direct	Surface collection
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
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
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
37-2-5845	Artefact scatter	Low	Direct	Surface collection
37-2-5846	Artefact scatter	Low	Direct	Surface collection
37-2-5847	Artefact scatter	Low	Direct	Surface collection
37-2-5862	Artefact scatter + PAD	Moderate	Potential subsidence	Monitoring. If impacted surface collection and potential salvage excavation

12.0 References Cited

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.

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

Anonymous. (1877a). Reminiscences - No. 1. *The Maitland Mercury & Hunter River General Advertiser*.

Anonymous. (1877b). Reminiscences - No. 2. *The Maitland Mercury & Hunter River General Advertiser*.

Anonymous. (1877c). Reminiscences No. 4. *The Maitland Mercury & Hunter River General Advertiser*.

Anonymous. (1877d). Reminiscences No. 5. *The Maitland Mercury & Hunter River General Advertiser*.

Archaeological Risk Assessment Services. (2006). *Aboriginal Archaeology & Cultural Heritage Assessment Report on Drayton Mine Extension*. Unpublished report for Anglo Coal Pty Ltd.

Archaeological Risk Assessment Services. (2010). *Cultural Heritage Management Report On Drayton Mine Extension Project Open Cut & Services Corridor Areas*. Unpublished report for Anglo Coal Pty Ltd.

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

Attenbrow, V. (2010). *Sydney's Aboriginal Past: Investigating the Archaeological and Historical Records*. Sydney: University of New South Wales Press.

Australian Government Department of the Environment. (2016). *Engage Early* (Vol. 1999). Retrieved from Commonwealth of Australia website: http://www.environment.gov.au/system/files/resources/3201a986-88e8-40f3-8c15-6e659ed04006/files/engage-early-indigenous-engagement-guidelines.pdf

Australian Heritage Commission. (2002). *Ask First: a guide to respecting Indigenous heritage places and values*. Retrieved from http://www.environment.gov.au/heritage/ahc/publications/commission/books/pubs/ask-first.pdf

Australian Museum Business Services. (1997). *Archaeological Test Excavations of Aboriginal Sites at Bettys Creek, Mt Owen Mine, Hunter Valley, NSW. Report to Mt Owen Mine, BHP Coal Australia in Four Volumes Volume 4: Appendix G*. Unpublished report for BHP Coal Australia.

Australian Museum Business Services. (2002). *Extension of Warkworth Coal Mine: Archaeological Assessment of Aboriginal Heritage*. Unpublished report for Coal and Allied Operations.

Backhouse, J. A. (1843). *A Narrative of a Visit to the Australian Colonies*. London: Hamilton Adams.

Baker, N. (1992a). Evidence From the Analysis of Backed Artefacts. In *Narama Salvage Project Lower Bayswater Creek Hunter Valley, NSW. Vol 4: Technological Studies.* (pp. 43–76). Unpublished report for Envirosciences Pty Ltd & Narama Joint Venture.

Baker, N. (1992b). Evidence From the Analysis of Cores. In *Narama Salvage Project Lower Bayswater Creek Hunter Valley, NSW. Vol 4: Technological Studies* (pp. 10–42). Unpublished report for Envirosciences Pty Ltd & Narama Joint Venture.

Baker, N. (1992c). Evidence From the Analysis of Whole Flakes. In *Narama Salvage Project Lower Bayswater Creek Hunter Valley, NSW: Technological Studies. Vol. 4.* (pp. 77–92). Unpublished report for Envirosciences Pty Ltd & Narama Joint Venture.

Baker, N. (1994). *Moffats Swamp Dune: Final Report on Archaeological Site Salvage, Testing & Artefact Analysis*. Unpublished report for RZM Pty Ltd.

Balek, C. L. (2002). Buried Artifacts in Stable Upland Sites and the Role of Bioturbation: A Review. *Geoarchaeology*, *17*(1), 41–51.

Barrallier, F. (1802). *Letter to C.F.Greville*. Banks Papers, Brabourne Collection. Mitchell Library MS A78-3.

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

Binford, L. R. (1980). Willow Smoke and Dogs' Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. *American Antiquity*, *45*(1), 4–20.

Binford, L. R., & Binford, S. R. (1968). Post-Pleistocene adaptations. In L. R. Binford & S. R. Binford (Eds.), *New Perspectives in Archaeology* (pp. 313–341). New York: Aldine Publishing.

Blyton, G., Heitmeyer, D., & Maynard, J. (2004). *Wannin Thanbarran: A History of Aboriginal and European Contact in Muswellbrook and the Upper Hunter Valley*. Muswellbrook: Muswellbrook Shire Aboriginal Reconcilitation Committee.

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

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

Brayshaw, H. (1987). *Aborigines of the Hunter Valley: A Study of Colonial Records.* Scone and Upper Hunter Historical Society.

Breton, W. H. (1833). *Excursions in New South Wales, Western Australia, and Van Dieman's Land During the Years 1830, 1831, 1832, and 1833*. London: Richard Bentley.

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

Butlin, N. G. (1983). *Our Original Aggression: Aboriginal Populations of Southeastern Australia 1788-1850*. Sydney: Allen & Unwin.

Capell, A. (1970). Aboriginal Languages in the South Central Coast, New South Wales: Fresh Discoveries. *Oceania*, *41*, 20–27.

Caswell, E. (1841). *Letter to C. Jackson, October 19*. Mitchell Library MS.Ac. 147.

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

Cowan, F. L. (1999). Making Sense of Flake Scatters: Lithic technological Strategies and Mobility. *American Antiquity*, *64*(4), 593–607.

Cribb, A. B., & Cribb, J. W. (1974). *Wild Food in Australia*. Sydney: Collins.

Cumberland Ecology. (2012). *Drayton South Coal Project; Ecology Impact Assessment*. Unpublished report for Hansen Bailey.

Cunningham, P. (1828). *Two Years in New South Wales; Comprising Sketches of the Actual State of Society in that Colony; of its Peculiar Advantages to Emigrants; of its Topography, Natural History, &c. &c.* London: Henry Colburn.

Davidson, I., James, R., & Fife, R. (1993). *Archaeological Investigations: Proposed Bayswater No. 3 Colliery Authorisation Area (A437)*. Report to Resource Planning Pty Ltd.

Davidson, I., & Lovell-Jones, C. (1993). *Ethnographic Investigations: Proposed Bayswater No. 3 Colliery Authorisation Area (A437)*.

Dawson, R. (1830). *The Present State of Australia*. London: London.

Dean-Jones, P. (1992). *Archaeological Investigations of Aboriginal Sites, Proposed North Western Open Cut Area*. Unpublished report for Lemington Coal Mines Ltd.

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

Department of Mines. (n.d.). *Singleton 1:250,000 Geological Series Sheet SI 56-1*.

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

Doleman, T. (2008). Time to Quarry: The Archaeology of Stone Procurement in Northwestern New South Wales, Australia. *BAR International Series*, *181*.

Dyall, L. (1977). *Environmental Studies - Mt Arthur Project (Hunter Valley): Full Report on Aboriginal Relics*. Report to Electricity Commission of NSW.

Dyall, L. (1980). *Aboriginal Relics on the Drayton Coal Lease, Muswellbrook*. Unpublished report.

Dyall, L. K. (2004). *The Aboriginal Middens at Birubi: An Account of Surface Collections (1964-1977) on the Aboriginal Site at Birubi, near Port Stpehens, New South Wales, and its Subsequent Excavation in 1978 and 1979*. Unpublished report.

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

Ebsworth, H. T. (1826). *A Letter Book, Kept at Sydney and Port Stephens*. ML.MS.B852.

Elkin, A. P. (1932). Notes on the Social Organization of the Worimi, a Kattang-Speaking People. *Oceania*, *2*(3), 359–363.

Enright, W. J. (1900). The Language, Weapons and Manufactures of the Aborigines of Port Stephens, NSW. *Journal and Proceedings of the Royal Society of New South Wales*, *24*, 103–118.

Enright, W. J. (1901). Aboriginal Districts and Notes [Location of Minyowie, Kurringgai, Darknung, WonnahRuah, Kamilaroi, Warrangine, Gringai; Comments on Difference in Dialects]. *Science of Man*, *4*(5), 80–81.

Enright, W. J. (1932). The Kattang (Kutthung) or Worimi: An Aboriginal Tribe. *Mankind*, *1*(4), 75–77.

Enright, W. J. (1933). Further Notes on the Worimi. *Mankind*, *1*(7), 161–162.

Enright, W. J. (1936). The Worimi Tribe. *Newcastle and Hunter District Historical Society Journal and Proceedings*, *1*, 85–89.

Enright, W. J. (1937). Notes on the Aborigines of the North Coast of New South Wales. *Mankind*, *2*(4), 88–91.

Environmental Earth Sciences NSW. (2012). *Drayton South Coal Project: Soils and Land Capability Impact Assessment*. Unpublished report for Hansen Bailey.

Environmental Resources Management Australia Pty Ltd. (2004). *Upper Hunter Valley Aboriginal Heritage Baseline Study*. Unpublished report for Upper Hunter Valley Aboriginal Heritage Trust.

Esteves, V. (1999). *Unravel and Gravel: A Study of Hunter River Mudstone and Silcrete Gravels, An Archaeological Perspective*. University of New England.

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

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

Fanning, P., Holdaway, S. J., & Rhodes, E. (2008). A New Geoarchaeology of Aboriginal Artefact Deposits in Western NSW, Australia: Establishing Spatial and Temporal Geomorphic Controls on the Surface Archaeological Record. *Geomorphology*, *101*(3), 524–532. https://doi.org/10.1016/j.geomorph.2007.04.027

Fawcett, J. . (1898a). Notes on the Customs and dialect of the Wonnah-Ruah Tribe. *Science of Man*, *1*(7), 152–154.

Fawcett, J. . (1898b). Notes on the Customs and Dialect of the Wonnah-ruah Tribe. *Science of Man*, *1*(8), 180–181.

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

Ford, G. E. (2010). *Darkinung Recognition: An Analysis of the Historiography for the Aborigines from the Hawkesbury-Hunter Ranges ti the Northwest of Sydney*. University of Sydney.

Fraser, J. (1892). *An Australian Language as Spoken by the Awabakal the People of Awaba or Lake Macquarie (Near Newcastle, New South Wales) Being an Account of Their Language, Traditions and Customs by LE Threlkeld. Re-arranged, Condensed and Edited, With an Introduction by*. Sydney: Charles Potter, Government Printer.

Fullagar, R. L. K., McDonald, J., Field, J. H., & Donlon, D. (2009). Deadly Weapons: Backed Microliths from Narrabeen, New South Wales. In M. Haslam, G. Robertson, A. Crowther, S. Nugent, & L. Kirkwood (Eds.), *Archaeological Science Under a Microscope: Studies in Residue and Ancient DNA Analysis in Honour of Thomas H. Loy* (pp. 258–270). Canberra: ANU E Press.

Future Ecology. (2019). *Maxwell Project Baseline Fauna Assessment Report*.

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

Goodall, H. (2008). *Invasion to Embassy: Land in Aboriginal Politics in New South Wales, 1770-1972*. Sydney: Sydney University Press.

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

Grant, J. (1803). *The Narrative of a Voyage of Discovery, Performed in his Vessel the Lady Nelson, of sixty tons burthen with sliding keels, in the years 1800, 1801, and 1802, to New South Wales*. London: C. Roworth.

Gray, A. (2018). St Clair Mission. Retrieved January 23, 2019, from https://australianmuseum.net.au/learn/cultures/atsi-collection/hunter-valley/st-clair-mission/

Gunson, N. (1974). *Australian Reminiscences and Papers of LE Threlkeld, Missionary to the Aborigines 1824-1859*. Canberra: Australian Institute of Aboriginal Affairs.

Haglund, L. (1989). *Technological Change: A Comparison of Developments in the Goulburn and Hunter River Valleys*. Unpublished report for Australian Institute of Aboriginal and Torres Strait Islander Studies,

Canberra.

Haglund, Laila. (1992). *Archaeological Investigations at Doctors Creek, Warworth, N.S.W. Salvage Excavation and Surface Collection in Compliance with NPWS Salvage Requirements. Sites NPWS 37-6-158, 37-6-162 and 37-6-458. Vols I-VI.* Unpublished report for Warkworth Mining Ltd.

Hale, H. (1846). The Languages of Australia. In *United States Exploring Expedition During the Years 1838, 1839, 1840, 1841, 1842. Under the Command of Charles Wilkes, USN. Vol. 6. Ethnography and Philology by Horatio Hale, Philologist of the Expedition*. Philadelphia: Lea & Blanchard.

Haslam, P., Heath, J., Jakes, B., James, B., Needham, B., Sokoloff, B., … West, J. (1984). *Aborigines of the Hunter Valley: Booklet 1*. Department of Education, Hunter Region, Hunter Social Studies Association, Ministry for Aboriginal Affairs NSW.

Helms, R. (1895). Anthropological Notes. *Proceedings of the Linnean Society of New South Wales*, *10*, 387–407.

Hiscock, P. (2008). *Archaeology of Ancient Australia*. London: Routledge.

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

Hiscock, Peter. (1986a). *A Technological Analysis of Stone Artefact Assemblages from the Hunter River Valley Region. NSW National Parks and Wildlife Service Hunter Valley Region Archaeology Project: Stage 1. Vol 4a.* Unpublished report for the NSW National Parks and Wildlife Service.

Hiscock, Peter. (1986b). Technological Change in the Hunter River Valley and the Interpretation of Late Holocene Change in Australia. *Archaeology in Oceania*, *21*, 29–39.

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

Hiscock, Peter. (1993b). The Distribution of Points Within Nauwalabila 1. *The Beagle*, (10), 173–178.

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

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

Hiscock, Peter. (2006). *Blunt to the Point: Changing Technological Strategies in Holocene Australia*.

Hiscock, Peter, & Attenbrow, V. (1998). Early Holocene Backed Artefacts From Australia. *Archaeology in Oceania*, *33*(2), 49–63.

Hiscock, Peter, & Mitchell, S. (1993). Stone Artefact Quarries and Reduction Sites in Australia: Towards a Type Profile. In *Australian Heritage Commission Technical Publication Series No 4*. Canberra: Australian Government Publishing Service.

HLA-Envirosciences Pty Ltd. (1990). *Regional Study of Heritage Significance, Central Lowlands, Hunter Valley*. Report by HLA Envirosciences for the Electricity Commission of NSW.

HLA-Envirosciences Pty Ltd. (2002). *Archaeological Assessment of Proposed Drayton Mine Extension EIS*. Unpublished report for Macquarie Generation.

Hofman, J. L. (1986). Vertical Movement of Artifacts in Alluvial and Stratified Deposits. *Current Anthropology*, *27*(2), 163–171.

Holdaway, S. J. (1993). *Hunter Valley Aboriginal Sites Assessment Project Archaeological Assessment Standards and Methodological Design*. Unpublished report for NSW National Parks and Wildlife service.

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

Holdaway, S. J., Witter, D. C., & Fanning, P. (1998). New Approaches to Open Site Spatial Archaeology in Sturt National Park, New South Wales, Australia. *Archaeology in Oceania*.

Hughes, P. J. (1984). *Hunter Valley Region Archaeology Project Stage 1. Volume 1: An Overview of the Archaeology of the Hunter Valley, its Environmental Setting and the Impact of Development*. Unpublished report for NSW National Parks and Wildlife Service.

Hughes, P. J., & Hiscock, P. (2000). *Archaeological and Geomorphological Excavations at the Proposed Carrington Mine site, Hunter Valley, NSW*. Unpublished report for Environmental Resources Management Australia.

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

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

Hunter, C. (2010). *People Property Power: Plashett, Jerry's Plains*. Brisbane: Anglo Americal Metallurgical Coal Pty Ltd.

Hunter Eco. (2019). *Maxwell Project Baseline Flora Report*. Unpublished report for Malabar Coal.

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

Isaacs, J. (2002). *Bush Food: Aboriginal Food and Herbal Medicine*. Marleston: JB Books.

Jo McDonald Cultural Heritage Management Pty Ltd. (2005). *Archaeological Salvage Excavation of Eight Archaeological Landscapes in the Second Ponds Creek Valley, Rouse Hill Development Area, NSW, Volume 1*. Unpublished report for Rouse Hill Infrastructure Pty Ltd and Landcom.

Johnson, D. L. (1989). Subsurface Stone Lines, Stone Zones, Artifact-Manuport Layers, and Biomantles Produced by Bioturbation via Pocket Gophers (Thomomys Bottae). *American Antiquity*, *54*(2), 370–389.

Johnson, D. L., Domier, J. E. J., & Johnson, D. N. (2005). Reflections on the Nature of Soil and Its Biomantle. *Annals of the Association of American Geographers*, *95*(1), 11–31.

Jones, R., & White, N. (1988). Point Blank: Stone Tool Manufacture at the Ngilipitji Quarry, Arnhem Land 1981. In B. Meehan & R. Jones (Eds.), *Archaeology with Ethnography: An Australian Perspective* (pp. 51–87). Canberra: Department of Prehistory, Research School of Pacific Studies, Australian National University.

Koettig, M. (1990). *Regional Study of Heritage Significance. Central Lowlands: Hunter Valley. Electricity Commission Holdings. Volume 3: Assessment of Aboriginal Sites.* Unpublished report for Electricity Commission of NSW.

Koettig, M. (1992). *Salvage Excavations of Aboriginal Sites on the Camberwell Lease. Volumes 1-3.* Unpublished report for Camberwell Coal Pty Ltd.

Koettig, M. (1994). *Bulga Lease Authorisation 219 Salvage Excavations. Volumes 1-5.* Bulga: Unpublished report for Saxonvale Coal Pty Ltd.

Koettig, Margrit. (1986). *Test Excavations at Six Locations along the Proposed Pipeline Route between Singleton and Glennies Creek Dam, Hunter Valley Region, NSW*. Report to the Public Works Department by Margrit Koettig.

Koettig, Margrit, & Hughes, P. J. (1983). *Archaeological Investigations on the United Collieries Coal Lease, Warkworth, Hunter Valley, NSW.* A report to United Collieries, Pty Ltd, Singleton, NSW.

Koettig, Margrit, & Hughes, P. J. (1985a). *Archaeological Investigations at Plashett Dam, Mount Arthur North, and Mount Arthur South in the Hunter Valley. Vols 1 - 3*. Unpublished report for the Electricity Commission fo New South Wales and Mount Arthur South Coal Pty Lt.

Koettig, Margrit, & Hughes, P. J. (1985b). *Archaeological Investigations at Plashett Dam, Mount Arthur North and Mount Arthur South in the Hunter Valley, NSW - Volume 2: The archaeological survey* (Vol. 2). Unpublished report for the Electricity Commission fo New South Wales and Mount Arthur South Coal Pty Lt.

Kohen, J. (1993). *Darug and their Neighbours: The Traditional Aboriginal Owners of the Sydney Region*. Sydney: Darug Link in association with Blacktown and District Historical Society.

Kovac, M., & Lawrie, J. W. (1991). *Soil Landscapes of the Singleton 1:250 000 Sheet*. Sydney: Soil Conservation Service of NSW.

Kuskie, P. (1994). *Further Archaeological Investigations of Lot 1 DP 559519, Thornton, NSW*. Unpublished report for Gutteridge Haskins & Davey Pty Ltd.

Kuskie, P.J. (2001). *Salvage of Aboriginal Heritage Sites in the South Lemington Coal Mine Lease, Hunter Valley, New South Wales. Vols A-C.* Unpublished report for Lemington Coal Mines Pty Ltd.

Kuskie, P.J., & Clarke, E. A. (2004). *Salvage of Aboriginal Heritage Sites in the Mount Arthur North Coal Mine Lease. Volumes A-C.* Unpublished report for BHP Billiton-Hunter Valley Energy Coal.

Kuskie, P.J., & Kamminga, J. (2000). *Salvage of Aboriginal Archaeological Sites in Relation to the F3 Freeway, Near Lenaghans Drive, Black Hill, New South Wales. Volumes A-C.* Unpublished report for NSW Roads & Traffic Authority.

Kuskie, Peter J. (2000a). *An Aboriginal Assessment of the Proposed Mount Arthur North Coal Mine, Near Muswellbrook, Hunter Valley, New South Wales*. Report to Dames and Moore.

Kuskie, Peter J. (2000b). An Aboriginal Assessment of the Proposed Mount Arthur North Coal Mine, Near

Muswellbrook, Hunter Valley, New South Wales. In HLA-Envirosciences Pty. Ltd. (Ed.), *Environmental Impact Statement and Statement of Environmental Effects, Proposed Jerrys Plains Coal Terminal, Rail Spur and Associated Infrastructure.* Canberra: Report prepared by South Eastern Archaeology to Umwelt (Australia) Pty. Ltd.

Larmer, J. (1898). “Brisbane Water and Tuggerah Beach Lakes” and “Hunter’s River, Brisbane Water and Newcastle.” *Journal of the Royal Society of New South Wales*, *32*, 223–225.

Lassak, E., & McCarthy, T. (2001). *Australian Medicinal Plants*. Sydney: New Holland.

Lissarrague, A. (2006). *A Salvage Grammar and Wordlist of the Language From the Hunter River and Lake Macquarie*. Nambucca Heads: Muurrbay Aboriginal Language and Culture Cooperative.

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

MacDonald, K., & Davidson, I. (1998). *Bayswater Archaeological Research Project: Volumes 1-2.* Armidale: School of Human and Environmental Studies, University of New England.

Matthews, R. H. (1898). Initiation Ceremonies of the Native Tribes of Australia. *Proceeding of the American Philosophical Society*, *37*(157), 54–73.

Matthews, R. H. (1903). Languages of the Kamilaroi and Other Aboriginal Tribes of New South Wales. *Journal of the Anthropological Institute of Great Britain and Ireland*, *33*, 259–283.

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

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

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

McCarthy, Frederick David, & Davidson, F. (1943). The Elouera Industry of Singleton, Hunter River, New South Wales. *Records of the Australian Museum*, *21*(4), 210–230.

McDonald, J. (1996). The Conservation of Landscapes: A Strategic Approach to Cultural Heritage Management. In S. Ulm, I. Lilley, & A. Ross (Eds.), *Australian Archaeology ’95: Proceedings of the 1995 Australian Archaeological Association Annual Conference* (Tempus 6, Vol. 6, pp. 113–121). Brisbane: Anthropology Museum, University of Queensland.

McDonald, J., Donlon, D., Field, J. H., Fullagar, R. L. K., Coltrain, J. B., Mitchell, P. B., & Rawson, M. (2007). The First Archaeological Evidence for Death by Spearing in Australia. *Antiquity*, *81*, 877–885.

McKiernan, B. (1911). Some Notes on the Aborigines of the Lower Hunter River. *Anthropos*, *6*, 885–892.

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

Miller, J. (1985). *Koori: A Will To Win - The Heroic Resistance, Survival & Triumph of Black Australia*. Sydney: Angus and Robertson Publishers.

Miller, R. (1887). The Hunter River. The Wonnarua Tribe and Language. In E. M. Curr (Ed.), *The Australian Race* (pp. 352–357). Melbourne: Government Printer.

Mills, R. (2000). *An Archaeological Survey for a Feasibility Study for Saddlers Creek Mine, near Muswellbrook*. Unpublished report for Shell Coal.

Mine Subsidence Engineering Consultants. (2019). *Maxwell Project Subsidence Assessment*. Unpublished report for Malabar Coal.

Mitchell, P. B. (2009). *Soil Materials and Landscape Disturbance on the Southwestern Sector of the ADI Site at St Marys in Relation to Aboriginal Archaeological Investigations*. Unpublished report for Jo McDonald CHM.

Moore, D. R. (1969). The Prehistory of the Hunter River Valley. *Australian Natural History*, *16*(5), 166–171.

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

Moore, D. R. (1981). Results of an Archaeological Survey of the Hunter River Valley, New South Wales, Australia. Part II: Problems of the Lower Hunter and Contacts with the Hawkesbury Valley. *Records of the Australian Museum*, *33*(9), 388–442.

Moore, M. (1997). *Further Technological Descriptions of Artefacts Excavated at Bettys Creek, Mt Owen Mine, Hunter Valley, NSW. Archaeological Test Excavations of Aboriginal Sites at Bettys Creek, Mt Owen Mine, Hunter Valley, NSW. Vol. 2.* Unpublished report for Mt Owen Mine, BHP Coal Australia.

Moore, M. (2000). Technology of Hunter Valley Microlith Assemblages, New South Wales. *Australian*

Archaeology, *51*, 28–39.

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

Moore, P. (2014). *Personal correspondence 29 June 2014*.

New South Wales Police Force. (2015). *NSW Police Force Handbook*.

Noetling, F. (1907). The native quarry on Coal Hill, near Metlton-Mowbray. *Tasmanian Naturalist*, *1*(2), 14–19.

Noetling, F. (1908). The native quarry of Syndal, near Ross, New South Wales. *Papers and Proceedings of the Royal Society of Tasmania*, *18*, 44–52.

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

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

NSW Health. (2013). *Burials - Exhumation of Human Remains*. Retrieved from http://www.health.nsw.gov.au/policies/pd/2008/pdf/PD2008_022.pdf

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

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

OzArk Environmental & Heritage Pty Ltd. (2013). *Aboriginal Archaeological Values Assessment Bulga Optimisation Project*.

Paton, T. R., Humphreys, G. S., & Mitchell, P. B. (1995). *Soils: A New Global View*. London: UCL Press.

Peacock, E., & Fant, D. W. (2002). Biomantle Formation and Artifact Translocation in Upland Sand Soils: An Example from the Holly Springs National Forest, North-Central Mississippi, U.S.A. *Geoarchaeology*, *17*(1), 91–114.

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

Peterson, N. (1976). *Tribes and Boundaries in Australia* (N. Peterson, Ed.). Canberra: Australian Institute of Aboriginal and Torres Strait Islander Studies.

Raggatt, H. G. (1938). Note on Some Silicified Sands ('Grey Billy') in the Hunter Valley (N.S.W.). *Journal and Proceedings of the Royal Society of NSW*, *72*, 318–324.

Reid, J. (1998). *An Archaeological Approach to Quarry Studies: A technical Investigation of the Ironbark Site Complex, Southern Curtis Coast, Australia*. The University of Queensland.

Rich, E. (1992). *Narama Salvage Project, Lower Bayswater Creek, Hunter Valley, NSW. Vol 1: Overview*. Unpublished report for Envirosciences Pty Ltd & Narama Joint Venture.

Rich, Elizabeth. (1991). *Investigation of Aboriginal Sites SW3 and SC4 at South Wambo, Near Bulga, NSW*. Unpublished report for Envirosciences Pty Ltd.

Rich, Elizabeth. (1993). *Archaeological Investigation of Sites 37-5-63 and 37-5-126, Hunter Valley No.1 Mine*. Unpublished report for Coal and Allied Operations Pty Ltd.

Robertson, G. (2011). Aboriginal Use of Backed Artefacts at Lapstone Creek Rock-Shelter, New South Wales: An Integrated Residue and Use-Wear Analysis. *Technical Reports of the Australian Museum*, *23*(7), 83–101.

Robertson, G., Attenbrow, V., & Hiscock, P. (2009). Multiple Uses for Australian Backed Artefacts. *Antiquity*, *83*, 296–308.

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

Scarp Archaeology. (2009). *Warkworth Sands Archaeological Project*. Unpublished report for Rio Tinto Coal Australia.

Schlanger, N. (1992). Recognising Persistent Places in Anasazi Settlement Systems. In J. Rossignol & L. Wandsnider (Eds.), *Space, Time and Archaeological Landscapes* (pp. 91–112). New York: Plenum Press.

Scott, W. (1929). *The Port Stephens Blacks: Recollections of William Scott*. Dungog: The Chronical Office.

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

Archaeopress.

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

Sokoloff, B. (1980). *The Worimi: Hunter Gatherers at Port Stephens*. Raymond Terrace: Raymond Terrace and District Historical Society.

South East Archaeology Pty Ltd. (2012). *Tasman Extension Project, Cessnock and Lake Macquarie Local Government Areas, Hunter Valley, New South Wales: Aboriginal Cultural Heritage Asssessment*. Unpublished report for Donaldson Coal Pty Ltd.

Speight, J. G. (2009). Landform. In R. C. McDonald Isbell, R.F., Speight, J.G., Walker, J. and Hopkins, M.S. (Ed.), *Australian soil and land survey field handbook* (3rd ed., pp. 15–72). Melbourne: CSIRO Publishing.

Stein, J. K. (1983). Earthworm Activity: A Source of Potential Disturbance of Archaeological Sediments. *American Antiquity*, *48*(2), 277–289.

Stewart, K., & Percival, B. (1997). *Bush Foods of New South Wales: A Botanic Record and an Aboriginal Oral History*. Sydney: Royal Botanic Gardens Sydney.

Story, R., Galloway, R. W., van de Graaf, R. H. M., & Tweedie, A. D. (1963). General Report on the Lands of the Hunter Valley. In *Land research Series No 8*. Melbourne: CSIRO.

Threlkeld, L. E. (1827). *Specimens of a Dialect of the Aborigines of New South Wales; Being the First Attempt to Form Their Speech Into a Written Language*. Sydney: Monitor Office.

Threlkeld, L. E. (1834). *An Australian Grammar, Comprehending the Principles and Natural Rules of the Language as Spoken by the Aborigines in the Vicinity of Hunter's River, Lake Macquarie & c.* Sydney: Stphens & Stokes.

Threlkeld, L. E. (1836). *An Australian Spelling Book in the Language as Spoken by the Aborigines in the Vicinity of Hunter's River, Lake Macquarie, New South Wales*. Sydney: Stephens & Stokes.

Threlkeld, L. E. (1850). *A Key to the Structure of the Aboriginal Language Being an Analysis of the Particles Used as Suffixes, to Form the Various Modifications of the Verbs; Shewing the Essential Powers, Abstract Roots, and Other Peculiarities of the Language Spoken by the Abo*. Sydney: Kemp & Fairfax.

Tindale, N. B. (1974). *Aboriginal Tribes of Australia: Their Terrain, Environmental Controls, Distribution, Limits and Proper Names*. Canberra: Australian University Press.

Turner, J., & Blyton, G. (1995). *The Aboriginals of Lake Macquarie: A Brief History*. Speers Point: Lake Macquarie City Council.

Umwelt (Australia) Pty Ltd. (2006a). *Archaeological Assessment for Downcast Ventilation Shaft and Associated Infrastructure, Proposed Exploration Adit*. Prepared for Mt Arthur Coal Pty Ltd.

Umwelt (Australia) Pty Ltd. (2006b). *Proposed National Highway Link F3 to Branxton: Preliminary Report Stage 2 Section 90 Salvage and Section 87 Subsurface Investigation*. Unpublished report for NSW Roads and Traffic Authority (RTA).

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

White, B. (2012). Minimum Analytical Nodules and Lithic Activities at Site W2, Hunter Valley, New South Wales. *Australian Archaeology*, *75*, 25–36.

White, E. (1998). *Archaeological Salvage of Site B10 & B33 Bengalla Mine, Hunter Valley, NSW.* Unpublished report for Bengalla Mining Company.

White, E. (1999). *From Artefacts to the Actions of People in Prehistory: A Behavioural Study of the W2 Stone Artefact Assemblage, Hunter Valley, NSE*. University of Sydney.

Wilton, C. (1846). Aborigines. Replies to a Circular Letter, addressed to the Clergy, of all Denominations, By Order of The Select Committee on the Condition of the Aborigines. Ordered, By the Council, To be Printed 31st October 1846. Sydney: Printed by W.W. Davies, At the . Retrieved December 23, 2018, from University of Newcastle Library guides website: http://libguides.newcastle.edu.au/aboriginalsourcebook/1846#wilton

Wood, W. A. (1972). *Dawn in the Valley: The Story of Settlement in the Hunter River Valley to 1833*. Sydney: Wentworth Books.

Zola, N., & Gott, B. (1992). *Koorie Plants, Koorie People: Traditional Aboriginal Food, Fibre and Healing Plants of Victoria*. Melbourne: Koorie Heritage Trust.

Appendix A

Cultural Values Report

Malabar Coal Limited
17-Jun-2019

Maxwell Project

Aboriginal Cultural Values Report

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

Maxwell Project

Aboriginal Cultural Values Report

Client: Malabar Coal Limited

ABN: 73 093 876 307

Prepared by

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

17-Jun-2019

Job No.: 60576801

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 AS/NZS4801 and OHSAS18001.

© AECOM Australia Pty Ltd (AECOM). All rights reserved.

AECOM has prepared this document for the sole use of the Client and for a specific purpose, each as expressly stated in the document. No other party should rely on this document without the prior written consent of AECOM. AECOM undertakes no duty, nor accepts any responsibility, to any third party who may rely upon or use this document. This document has been prepared based on the Client's description of its requirements and AECOM's experience, having regard to assumptions that AECOM can reasonably be expected to make in accordance with sound professional principles. AECOM may also have relied upon information provided by the Client and other third parties to prepare this document, some of which may not have been verified. Subject to the above conditions, this document may be transmitted, reproduced or disseminated only in its entirety.

Quality Information

Document	Maxwell Project
Date	17-Jun-2019
Prepared by	Geordie Oakes
Reviewed by	Andrew McLaren

Revision History

Rev	Revision Date	Details	Authorised Name/Position Signature
1	29-Apr-2019	Technical review	Andrew McLaren (Senior Heritage Specialist AECOM)
2	6-Jun-2019	Client review	William Dean (Malabar Coal Limited)
3	17-Jun-19	Finalisation	Geordie Oakes (Principal Heritage Specialist AECOM)

Table of Contents

1.0 Introduction & Background 6
1.1 Introduction 6
1.2 Project Overview 6
1.3 Study Area 8
1.4 Report Objectives 8
1.5 Project Team 8
1.6 Limitations 8
2.0 Methodology 11
2.1 What are Aboriginal Cultural Values? 11
2.2 What is Cultural Significance 11
2.3 Aboriginal Cultural Landscape 12
2.4 Consultation Process 13
2.4.1 Stage 1 - Notification and Registration 13
2.4.2 Stage 2 - Presentation of Information about Project 14
2.4.3 Stage 3 – Gathering Information about Cultural Values 14
3.0 Identified Cultural Values 15
3.1 Cultural Landscape 15
3.2 Aboriginal Dispossession and Resistance in the Mid to Upper Hunter Valley 17
3.2.1 Mount Arthur Massacre 45
3.3 Resilience and Adaption 47
3.4 Mount Arthur Burial 47
3.5 Archaeology in the Study Area 48
3.6 Raw Material Sources and Quarries 48
3.7 Plant Resources 49
4.0 Summary of Findings 52
5.0 Acknowledgments 52
6.0 References 53

List of Figures

Figure 1 Project General Arrangement (Source: Malabar 2019) 9
Figure 2 Study Area 10
Figure 3 Map of the Hunter Valley showing European landholdings up to 1825. Estates of relevance to incidents of Aboriginal-European conflict between 1825 and 1827 marked with arrows and labelled (modified from Campbell, 1926) 24
Figure 4 Gollan's (1993) map of land unsettled by Europeans in 1826 (from Gollan, 1993: Map 1) 25
Figure 5 Gollan's (1993) map of Aboriginal 'attacks' leading to the Ravensworth massacre (from Gollan, 1993: Map 3) 25
Figure 6 Map showing the location of reported incidents of Aboriginal-European conflict in the Hunter Valley between 1825 and 1827, including the 'Ravensworth massacre' (from Dunn, 2015: 228, Fig. 16). 26
Figure 7 William Ogilvie's April 1827 return for the Merton district, Page 1 of 2 (SRNSW, 4/2045) 36
Figure 8 William Ogilvie's April 1827 return for the Merton district, Page 2 of 2 (SRNSW, 4/2045) 37
Figure 9 James Glennie's August 1829 return for the Patrick's Plains district, Page 1 of 3 (SRNSW, 4/2045) 38
Figure 10 James Glennie's August 1829 return for the Patrick's Plains district, Page 2 of 3 (SRNSW, 4/2045) 39
Figure 11 Samuel Wright's April 1827 return for the Wallis Plains district, Page 1 of 1 (SRNSW, 4/2045) 40
Figure 12 James Glennie's August 1829 return for the Patrick's Plains district, Page 3 of 3 (SRNSW, 4/2045 41

Figure 13 Return of Aboriginal Natives, Patrick's Plains, 2 June 1834 1. This return lists the 'place of district of usual resort' for the 'Hungary Hill Tribe' as Fal Brook (SRNSW, Reel 3706) 42
Figure 14 Francis Little's June 1828 return for the district surrounding his Invermien estate in Dartbrook Page 1 of 2 (SRNSW, 4/2045) 43
Figure 15 Francis Little's June 1828 return for the district surrounding his Invermien estate in Dartbrook Page 2 of 2 (SRNSW, 4/2045) 44
Figure 16 Map showing the location of 'The Pocket', adjacent to Mount Arthur proper, as well as Belmont homestead. The gully behind the property Belmont is also marked 46

List of Tables

Table 1 Values relevant to determining cultural significance, as defined by The Burra Charter (ICOMOS 2013) 12
Table 2 Registered Aboriginal Parties 13
Table 3 Aboriginal returns for districts and estates in the mid-to-upper Hunter valley between 1827 and 1844 (data compiled from originals / facsimiles held at the State Archives of New South Wales, [4/2045], Reel 3706) 30
Table 4 Economic plant species identified within the Project area 50

1.0 Introduction & Background

1.1 Introduction

AECOM Australia Pty Ltd (AECOM) was commissioned by Malabar Coal Limited (Malabar) to complete an Aboriginal cultural heritage assessment for the Maxwell Project (the Project), a proposed underground coal mine, located to the east-southeast of Denman and south-southwest of Muswellbrook, within the local government area (LGA) of Muswellbrook, New South Wales (NSW). This Cultural Values Report (CVR) is an appendix to the Aboriginal Cultural Heritage Assessment Report (ACHAR) prepared for the project. These documents will form part of the Environmental Impact Statement (EIS) which will support a Development Application for the Project in accordance with Part 4 of *the Environmental Planning and Assessment Act 1979* (EP&A Act).

This CVR documents the results of AECOM's consultation with Registered Aboriginal Parties (RAPs) as well a background historical research. It has been prepared in accordance with the NSW Office of Environment and Heritage's (OEH's) *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (Department of Environment, Climate Change and Water [DECCW] 2010) and *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011a), with reference to *The Burra Charter: Australian ICOMOS Charter for Places of Cultural Significance* (the Burra Charter) (Australia International Council on Monuments and Sites [ICOMOS] 2013) and in accordance with the first Secretary's Environmental Assessment Requirements (SEARs) issued on 3 September 2018, supplementary SEARs on 20 November 2018 and revised SEARs issued on 17 January 2019 for the Project.

1.2 Project Overview

The Project would involve an underground mining operation that would produce high-quality coals over a period of approximately 26 years.

Underground mining is proposed within Exploration Licence (EL) 5460, which was acquired by Malabar in February 2018. Malabar also acquired existing infrastructure within Coal Lease (CL) 229, Mining Lease (ML) 1531 and CL 395, known as the "Maxwell Infrastructure" (Figure 1). The Project would include the use of the substantial existing Maxwell Infrastructure, along with the development of some new infrastructure.

At least 75% of coal produced by the Project would be capable of being used in the making of steel (coking coals). The balance would be export thermal coals suitable for the new generation High Efficiency, Low Emissions power generators.

The Project would involve 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 majority of surface infrastructure required for the Project is in place, having supported mining operations for over 30 years. The existing Maxwell Infrastructure would be used for handling, processing and transportation of coal for the life of the Project. The Maxwell Infrastructure includes an 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).

A mine entry area would be developed for the Project in a natural valley in the north of EL 5460 to support underground mining and coal handling activities and provide for personnel and materials access.

ROM coal brought to the surface at the mine entry area would be transported to the Maxwell Infrastructure area. Early ROM coal would be transported via internal roads during the construction and commissioning of a covered overland conveyor system. Subsequently, ROM coal would be transported via the covered overland conveyor system.

The Project would support continued rehabilitation of previously mined areas and overburden emplacement areas within CL 229, ML 1531 and CL 395. The volume of the East Void would be reduced through the emplacement of reject material generated by the Project's coal processing activities and would be capped and rehabilitated at the completion of mining.

A detailed description of the Project will be provided in the main document of the EIS.

The Project would include a number of key components, some of which require surface disturbance, including:

1. Mine entry area to access the underground mining areas – approximately 48 hectares (ha).
2. Transport and services corridor – approximately 104 ha outside of the existing mining disturbance.
3. Potential for re-alignment of Edderton Road – approximately 10 ha.
4. Product stockpile expansion – approximately 5 ha.
5. Other works and ancillary infrastructure.
6. Subsidence zone – area within the underground mining area and surrounds.

Mine Entry Area

The mine entry area would include infrastructure, services and facilities that would support underground mining and coal handling activities and provide for personnel and materials access to the underground mine. The mine entry area would also include ventilation infrastructure.

Transport and Services Corridor

The transport and services corridor would include:

- a site access road from the Maxwell Infrastructure; and
- a covered, overland coal conveyor system to transport ROM coal from the mine entry area to the existing CHPP at the Maxwell Infrastructure.

The transportation of early ROM coal from the mine entry area to the existing CHPP would also occur via the internal roads within the transport and services corridor.

Edderton Road Realignment

Potential subsidence impacts on Edderton Road would be managed through either road maintenance along the existing alignment or realignment of the road around the underground mining area. This ACHAR conservatively assesses the potential impacts associated with realigning Edderton Road. The potential Edderton Road realignment would intersect the Golden Highway approximately 1 kilometre (km) to the west of the current intersection.

Product Stockpile Expansion

It is proposed to increase the capacity of the existing product stockpiles. An additional product stockpile would be constructed to the east of the existing product stockpiles, with a total area of 5 ha (some of which is previously approved disturbance).

Other Works and Ancillary Infrastructure

Other works and ancillary infrastructure would occur outside of the defined surface development areas throughout the life of the Project. These works would include, but not be limited to, environmental and subsidence monitoring activities, remediation of subsidence impacts, exploration, development of service boreholes, site maintenance activities and other minor ancillary works. These surface disturbances would be temporary and isolated in nature. The surface disturbances would occur progressively and these areas would be rehabilitated when no longer required.

1.3 Study Area

The study area for this assessment includes three spatially discrete parcels of land encompassing the proposed underground mining area, inclusive of a potential impact zone buffer, as well as land required for surface infrastructure (i.e., transport and services corridor, Edderton Road realignment, product stockpile extension, etc.)(Figure 2). Combined, these areas produce a study area of c. 2,330 ha that extends south of the existing Maxwell Infrastructure as a thin transport and services corridor, expanding to a roughly circular area south of Saddlers Creek and north of the Hunter River. The majority of land within the study area has historically, been used for grazing. Components of the Project that will occur on previously mined land have been excluded from the study area for this assessment.

1.4 Report Objectives

The overarching objectives of this CVR are as follows:

- to identify the Aboriginal cultural values of the study area by way of background research, archaeological survey and consultation with Registered Aboriginal Parties (RAPs); and
- to compile a CVR that will assist the Secretary of the Department of Planning and Environment (DP&E) in their assessment of the current State Significant Development (SSD) application.

1.5 Project Team

Geordie Oakes (Principal Heritage Specialist, AECOM) and Dr Andrew McLaren (Senior Heritage Specialist, AECOM) were the primary authors of this report.

Geordie holds a Bachelor of Arts (Honours) degree majoring in history, and historical/prehistoric Archaeology from Sydney University and also a Graduate Certificate in Paleo-anthropology from the University of New England. Geordie has over ten years of Australian Aboriginal cultural heritage management experience.

Andrew holds a Bachelor of Arts (Honours) degree from the University of Queensland, a Master 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.

1.6 Limitations

It is noted the registered Native Title claimant *Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People* (PCWP) did not wish to participate in consultation for this report or the broader ACHAR. In addition, AECOM understands that a confidential submission potentially containing cultural information relevant to the current study area was made to the Planning Assessment Commission regarding the Drayton South Coal Project. The PCWP has indicated that this report will not be made available for the current assessment.

Access to the Mount Arthur burial report is restricted and as such is not available for comment in this CVR.

Figure 1 Project General Arrangement (Source: Malabar 2019)

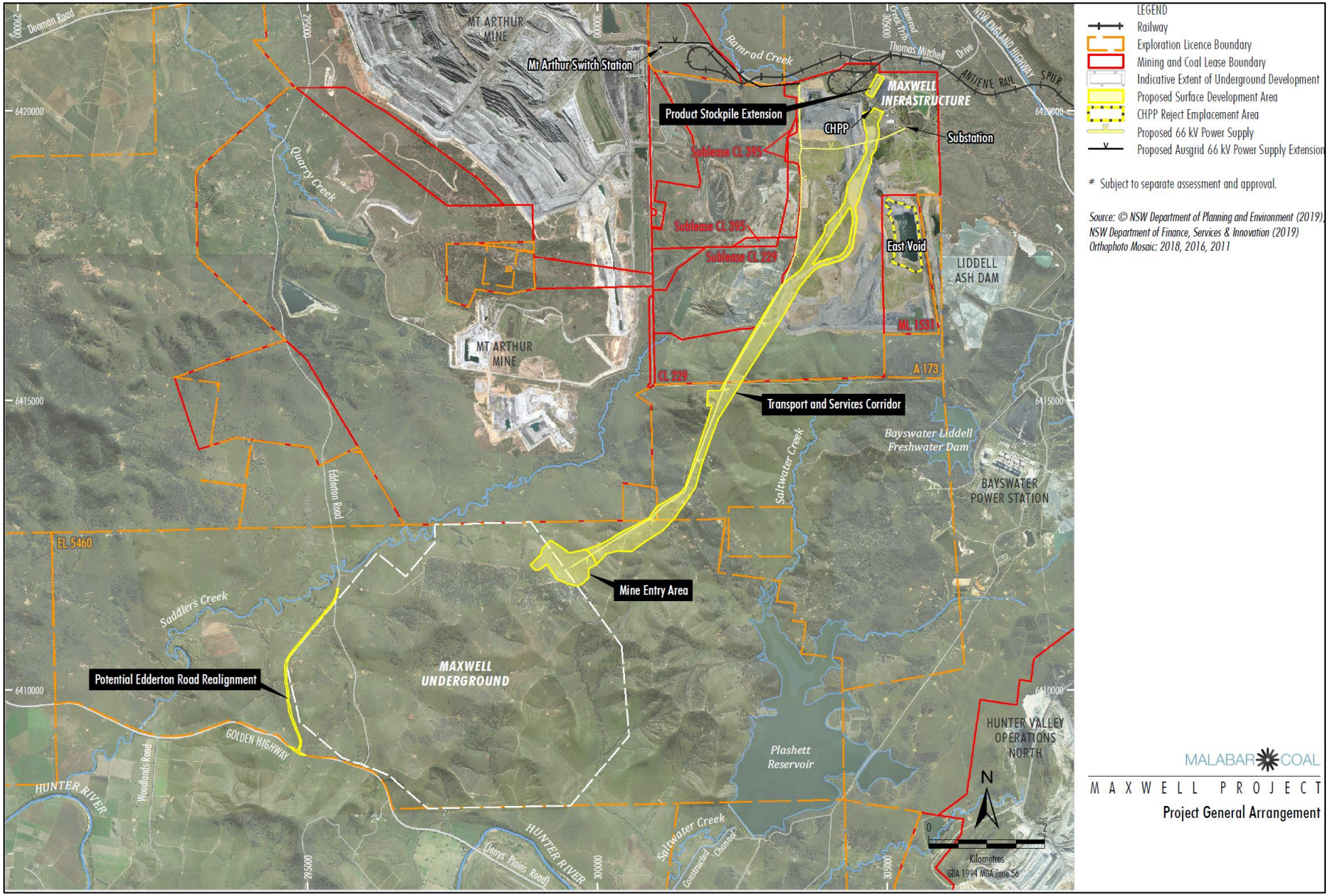
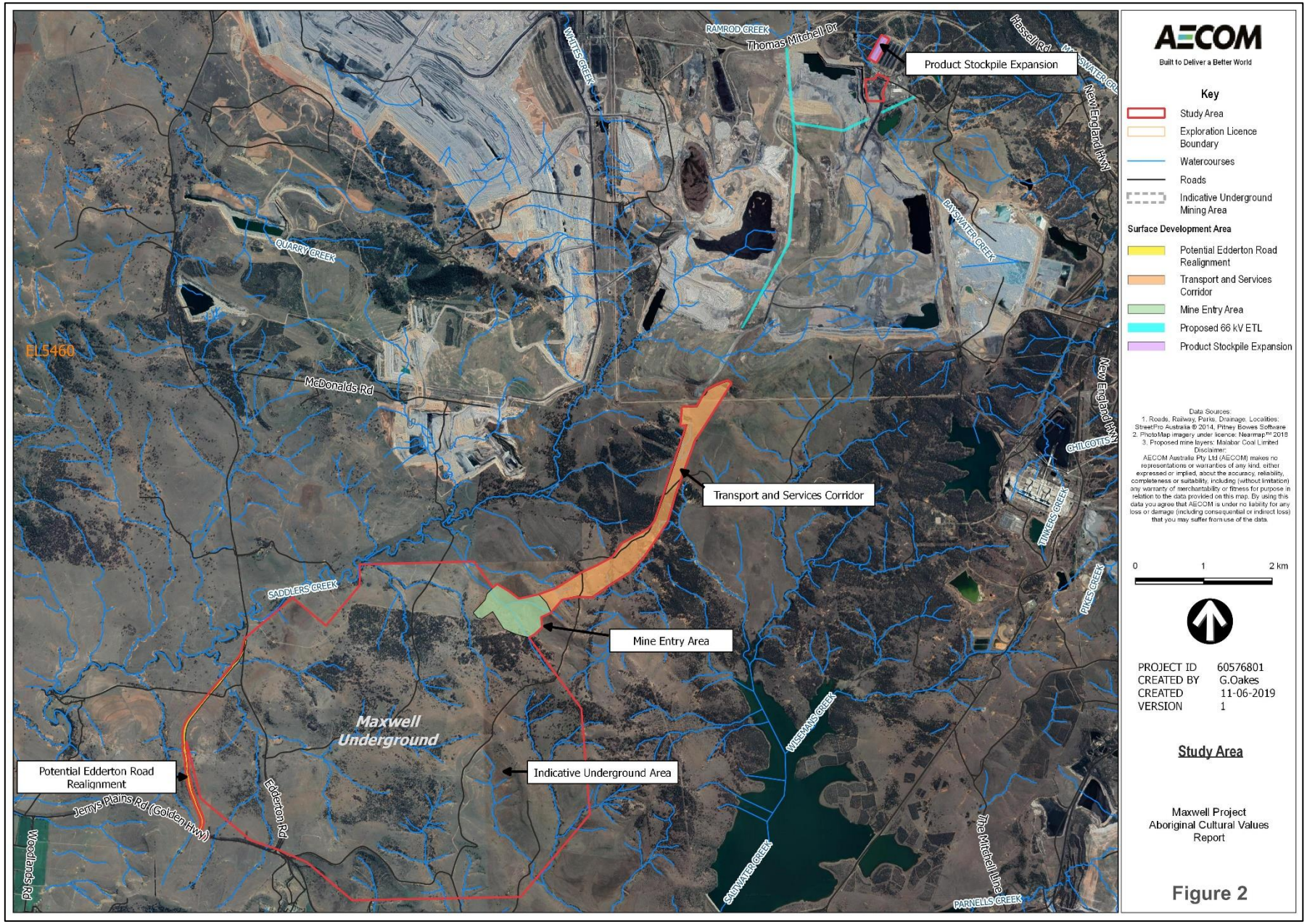


Figure 2 Study Area



2.0 Methodology

This CVR was prepared utilising information provided by RAPs in addition to undertaking background historical research to provide context for identified cultural values. Key tasks completed for the ACHAR, which has informed this CVR, (this assessment) include:

- Consultation with RAPs to identify cultural values;
- Survey of the study area with RAPs;
- Review of archaeological literature for the Upper Hunter Valley;
- Review of ethno-historical literature for the Hunter Valley;
- Searches of relevant historic heritage registers and lists; and
- Background research including reviews of relevant reports, publications, historic aerials and parish maps including:
    - State Library of NSW/Mitchell Library;
    - Trove newspaper archives and the Spatial Information Exchange (SIX) maps; and
    - State archives of NSW.

2.1 What are Aboriginal Cultural Values?

Aboriginal cultural values comprise of any place or object of significance to Aboriginal people resulting from their traditions, observances, lore, customs, beliefs and history. These values, which may comprise physical (tangible) or non-physical (intangible) elements are evidence of the lives and existence of Aboriginal people prior to European settlement through to the present. They include objects used by Aboriginal people such as stone tools, art sites and ceremonial or burial grounds as well as more contemporary elements such as old mission buildings, massacre sites and cemeteries which all form part of a broader cultural landscape (OEH 2011a).

Aboriginal cultural values also relate to the connection and sense of belonging that Aboriginal people have with the landscape and each other. These values are not only confined to sites but also include memories, storylines, ceremonies, language, ‘ways of doing things’, passing on knowledge and looking after cultural traditions and places (OEH 2011a).

Aboriginal cultural values provide a tangible link between the past and present - it is an essential part of Aboriginal people’s cultural identity, connection and sense of belonging to Country (OEH 2011a).

2.2 What is Cultural Significance

Assessing the cultural significance of a place or object requires defining the reason why a place is culturally important. This process can be difficult and emotive. However, it is only after understanding which places are culturally significant and why, can decisions be made about managing them. Once all the reasons for a place’s importance are set out, it is possible to assess any changes that may be caused by a proposed activity. This helps ensure any changes do not damage, diminish or remove the reasons for a place’s importance (OEH 2011a).

In Australia, the primary guide to the assessment of cultural significance is *The Burra Charter: 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 1). 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).

Table 1 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).

2.3 Aboriginal Cultural Landscape

The following is taken from DECCW's Fact Sheet 2 – What is an Aboriginal cultural landscape? (DECCW 2010). An Aboriginal cultural landscape is 'a place or area valued by an Aboriginal group (or groups) as a result of their long and complex relationship with that land. It can embody their traditional knowledge of spirits, places, land uses, and ecology. Material remains of the association may be prominent, but will often be minimal or absent' (Buggey 1999).

The landscape scale of cultural heritage is similar to the concept of 'whole-of-landscape' in ecosystem conservation – just as there is connectivity between all parts of natural ecosystems (e.g. plants, animals, soils and water) there is connectivity between cultural objects and places through past human behaviour patterns. The cultural landscape concept emphasises the landscape-scale of history and the connectivity between people, places and heritage items. It recognises that the present landscape is the product of long-term and complex relationships between people and the environment. Aboriginal cultural landscapes are comprised of:

1. Significant biodiversity and a diverse range of ecological systems and associations, all of which contributed to the continuing existence of Aboriginal peoples in the region over many thousands of years, and which are valued in different ways by Aboriginal communities today.
2. Material remains of this continuing occupation in the form of a diverse array of Aboriginal sites and places known to the Aboriginal communities, some of which will be recorded on the OEH Aboriginal Heritage Information Management System (AHIMS).
3. Extensive historical records from 1788 through to today which record observations of Aboriginal people and lifestyles, wars, massacres, social and cultural events, population census, social interactions, language, etc., and which influence Aboriginal community values today.
4. An Aboriginal population made up of people who have traditional association and knowledge of the region, as well as others who live, work and play within the region, all of whom may attribute various values with the area, derived from the distant and recent past, through to the present day.

For Aboriginal people, the significance of individual landscape features is derived from their interrelatedness within the cultural landscape. This means features cannot be assessed in isolation and any assessment must consider the feature and its associations in a holistic manner. This may require a range of assessment methods and will always require the close involvement and participation of Aboriginal people (DECCW 2010).

2.4 Consultation Process

Aboriginal community consultation for the current assessment was undertaken in accordance with OEH's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010) (Consultation Requirements), clause 80C of the NSW *National Parks and Wildlife Regulation 2009* and *Engage Early* (Australian Government Department of the Environment 2016). Further detail on the consultation completed for the project is provided in Section 3.0 of the ACHAR.

2.4.1 Stage 1 - Notification and Registration

Stage 1 included identifying (through consultation with regulatory agencies), notifying and registering of Aboriginal people who may hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the study area.

A total of 27 Aboriginal organisations registered an interest in the Project. Summary information on all RAPs, including registration dates, is provided in Table 2.

Table 2 Registered Aboriginal Parties

Organisation	Date of registration	Method	Contact Person
DNC	19-Jun-18	Email	Paul Boyd
Wanaruah Local Aboriginal Land Council	20-Jun-18	Email	Jamie-Lee
Margaret Mathews	20-Jun-18	Phone	Margaret Mathews
Divine Diggers	20-Jun-18	Phone	Deidre Perkins
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	Tom Miller
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

Organisation	Date of registration	Method	Contact Person
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 Horton
Aliera French Trading	20-Aug-18	Email	Aliera French

2.4.2 Stage 2 - Presentation of Information about Project

Malabar and AECOM completed initial consultation regarding the Project through the registration process with invitations to register containing key project information including a map of the study area. More detailed information, including a summary of study area environment, a review of relevant archaeological literature and AHIMS data, was provided to all RAPs as part of the draft assessment methodology.

Also contained within the methodology was an invitation for all RAPs to attend an ACHAR information session at the Maxwell Infrastructure site offices. The session was held on Friday 10 August 2018 with representatives from six RAPs attending including Hunter Valley Aboriginal Corporation, Cacatua, AGA Services, Culturally Aware, Wallagan Cultural Services and Ungooroo Aboriginal Corporation. The presentation included information about the Project, the study area, previous archaeological works completed, proposed disturbances, proposed avoidance of harm measures. The process of identifying cultural values was also discussed and invitations extended for RAPs to provide cultural values as part of the information session or via private meetings. Following the meeting, the draft methodology was finalised.

2.4.3 Stage 3 – Gathering Information about Cultural Values

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

- A request with the draft assessment methodology for any initial comments regarding the Aboriginal cultural heritage values of the study area;
- A request during the information session held on Friday 10 August 2018 for any information regarding the Aboriginal cultural heritage values of the study area;
- Discussion of cultural heritage values during fieldwork;
- Offers made to RAPs for private interviews, in case the information is considered culturally sensitive;
- Provision of the draft ACHAR to all RAPs for comment prior to finalisation; and
- Invitation to all RAPs to attend an ACHAR discussion session following the provision of the draft ACHAR.

3.0 Identified Cultural Values

RAPs participating in the assessment identified the following cultural values as relevant to the study area:

- The cultural landscape;
- Aboriginal dispossession and resistance:
- The Mount Arthur Burial;
- Archaeology in the study area;
- Raw material sources and quarry sites; and
- Plant resources.

These cultural values have been organised into themes for discussion below with further information provided for each.

3.1 Cultural Landscape

As discussed in Section 2.3, an Aboriginal cultural landscape is 'a place or area valued by an Aboriginal group (or groups) as a result of their long and complex relationship with that land. It can embody their traditional knowledge of spirits, places, land uses, and ecology. Material remains of the association may be prominent, but also may be absent. The World Heritage Convention of United Nations Educational, Scientific and Cultural Organization (UNESCO) suggest that a cultural landscape is one that combines works of nature and those of humankind and express a long and intimate relationship between people and their natural environment.

Aboriginal people have occupied the Hunter Valley region for thousands of years and have a strong connection to the local landscape. They will have moved across the Hunter Valley landscape utilising local landmarks as guides and in doing so creating an interconnecting network of pathways that link the natural environment with resource areas, camping grounds and ceremonial sites together. This connection, created prior to European encroachment, has been maintained and built on since that time.

Aboriginal pathways across the Hunter Valley landscape will have followed ridgelines, creeklines and other landscape features criss-crossing the landscape into places where neighbouring groups met up to trade, for social gatherings or to act out traditional ceremonies. Pathways used by Aboriginal people in the area may retain evidence of use in the form of scarred trees, middens, artefact sites, burials and rock art sites. The relationship between these sites, places and landscape features, including their views are integral elements in the cultural landscape. Elevated landscape positions or vantage points can provide line of sight between features which in themselves have cultural significance.

Previously identified pathways within the Hunter Valley as noted in OEH's *Pathways Across the Hunter a Cultural Journey* (OEH 2011b:15) includes a pathway from Muswellbrook travelling through the Goulburn River Valley to Nullo Mountain providing access over the Great Dividing Range and linking the Muswellbrook region to the Cudgegong River and the Liverpool Plains (Wiradjuri Country). Offering a permanent water source, the Goulburn River Valley would have been an ideal pathway, with archaeological evidence suggesting it was commonly utilised (OEH 2011b:15).

Alongside the Goulburn River Valley and Nullo Mountain, other areas of identified significance include Murrumbo Gap, Mt Dangar, Apple Tree Aboriginal area, Cassilis, Merriwa and Dunns Swamp (OEH 2011b:16). From Dunns Swamp, pathways likely went across the Wollombi and down to the Putty Road through Howes Valley to Bucketty. Growee Gulf to the Goulburn River has also been highlighted as a potential pathway with easy access and to a permanent water source. Other important sites and features found across the Hunter Valley that would have formed nodes linking pathways together include Mount Yengo, Biame Cave in Milbrodale, the Lizard Rock at Laguna and Burning Mountain at Wingen (OEH 2011b:16).

Biame Cave at Milbrodale shows an artistic representation depicting Biame the 'Creator' with outstretched arms. The site has been listed on the State Heritage Register (SHR) where the listing explains that Biame Cave is linked to the Creation story, country and totem (the Eagle) of the Wonnarua people, and is interconnected with numerous other Aboriginal cultural and heritage sites and landscapes throughout the Hunter Valley and NSW (SHR 2019).

Mount Yengo located in Yengo National Park west of Wollombi is likewise listed on the SHR. Mount Yengo is an important spiritual and ceremonial site for local Aboriginal people. It is the place where from which Biame jumped back up to the spirit world after he had created all of the mountains, lakes, rivers and caves in the area. Biame flattened the top of Mount Yengo when he jumped skyward and the flat top is still visible today (SHR 2019).

Lizard Rock at Laguna is said to be the birthplace of a giant lizard with a yellow rock considered to be the Lizard's head with its body being the ridgeline and an arch on the rock said to be the lizards eye. The lizard or goanna is said to protect Wonnarua Country, occupying a lookout between Broke and Milbrodale (OEH 2011b:18).

The story of Burning Mountain and the southern rock face in nearby Wingen Main Nature Reserve describes how a raiding party from the Kamilaroi north of the Liverpool Ranges attempted to steal Wonnarua women for wives. However, friends of the Wonnarua, the Wiradjuri to the west told them of the raid so they gathered their warriors and sent them to battle the raiding party. One of the warrior's wives sat on the top of a finger of sandstone waiting for her husband to return but he had been killed in the battle. She cried and her tears become flames that set the whole hill on fire. She asked Biame to take her life so Biame turned her to stone. As she turned to stone, she cried tears of fire, which rolled down the hillside and set Burning Mountain alight. It is said she can still be seen today, sitting and waiting on the southern rock face (OEH 2011b:19).

RAPs indicated that the study area sits within the broader cultural landscape described above and that it has cultural significance for Aboriginal people. Forming part of this cultural landscape locally are important landscape features including Mount Arthur, the Hunter River, and Saddlers Creek which surround the study area, as well as the Aboriginal objects (i.e., stone artefacts) identified during the archaeological survey for the Project. The presence of Aboriginal objects demonstrates that Aboriginal people camped within the study area but also undoubtedly moved through it as they traversed the region into the surrounding regions. One RAP stated:

> *The cultural landscape is of high importance to the Aboriginal people, it's a part of our cultural connection especially a majority of this Landscape as it tells a cultural story to us, and shows how all the sensitive cultural landscape surrounding this area all merge together to be part of a bigger picture*

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 Dyall (1977) during an archaeological assessment of the Mt Arthur Project. Dyall (1977) noted that during an enquiry with local residents there were 'suggestions that Mount Arthur itself was of special significance to the Aboriginal people'. 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 (see discussion below). The identification of an Aboriginal burial site on the Mount Arthur Coal Lease in 2001 likewise forms an important contribution to the significance of Mount Arthur to local Aboriginal people.

The Hunter River or *Coquun,* as it was called by some Aboriginal people (Albrecht 2000), formed an important resource for Aboriginal people in the past. Moreover, it was likely an important landscape feature that may have been utilised as a boundary marker but also a link between Aboriginal people in the region. As highlighted and discussed at length by Geary and Erskine (1984) the post-European settlement history of the Hunter River has been one of dynamic change, with significant channel changes and river bank erosion occurring since at least 1857. The Hunter River has been noted previously as an Aboriginal pathway linking the Muswellbrook and Singleton regions (Australian Cultural Heritage Management 2014; OEH 2011b).

Saddlers Creek is also a noted a focal point for past Aboriginal activity. As suggested by RAPs, the cultural significance of Saddlers Creek lies in its importance as a source of aquatic resources to past Aboriginal people living in the area. Saddlers Creek is likely to have been a significant source of water and also a major food resource for Aboriginal people travelling to and through the area.

3.2 Aboriginal Dispossession and Resistance in the Mid to Upper Hunter Valley

Concerted Aboriginal resistance to European colonisation of the mid-to-upper Hunter Valley commenced in the mid-1820s, with the opening of the valley for free settlement in 1822 prompting a land rush that fairly rapidly placed the region's resident Aboriginal population and European colonisers at loggerheads with each other. Initially, at least, the relationship between the two parties appears to have been one of relative peace, with few reported incidents of violence prior to 1825[1] (Dunn, 2015: 188-95; Miller, 1985: 33). As Dunn (2015: 190-91) has observed with reference to the Hunter Valley more broadly:

> *Initially the establishment of European farms did not seriously impinge Aboriginal movements across the country. In the first months and in some cases years after establishment, few of the estates had fence lines or enclosed lands, with large areas of the surrounding forest remaining uncleared. Aboriginal food sources were maintained to some degree, with access to grey kangaroo, possum, bandicoot and other small mammals and reptiles still available in the forests and across the open grassland, as were the freshwater mussels from the river and its tributaries. Yams were a staple through the valley, growing in the alluvial soil close to the river, with the seeds of the Zamia spiralis, berries of the Exocarpos cupressiformis or Native Cherry also included in the diet.*
>
> *However, increasing numbers of European livestock, growing areas of cultivation and European farms along the rivers did begin to compromise traditional food sources by the mid-1820s. European hunting of kangaroos and emus with dogs for sport disrupted this food source, scattering mobs from their feeding grounds. Flocks of sheep tended by shepherds and herds of cattle let loose in the bush gradually trampled native pastures. New settlers now ensconced on their grants, worked to clear the land, erecting huts and planting orchards while their convict servants built fences, systematically locking in land parcels. Their growing sense of entitlement and ownership appears to have worked to harden their views on an Aboriginal presence in their neighbourhood. So, soon after many of these settlers had utilised the skills of Aboriginal guides and interpreters, they were putting in place measures, often threatening or violent, to exclude Aborigines from the very country they had led them through. Evidence of extreme violence and depravity committed by European settlers and their convict servants were seemingly overlooked in the quest to secure land and property.*

[1] As Miller (1985) has noted, the fact that Aboriginal-European relations during the initial years of settlement appear to have been more-or-less cordial is of particular note given both the rapidity of European settlement at this time and well documented violence occurring in the adjoining Bathurst Plains region.

By late 1825, simmering tensions in the mid-to-upper Hunter, rooted in Aboriginal peoples' loss of access to traditional hunting and fishing grounds, a sharp decline in the availability of economic plant and animal resources and individual acts of physical violence against Aboriginal individuals and/or groups, boiled over into violent conflict. Regardless of the terminology used, be it a 'war' or 'uprising', available historical source materials for the mid-to-upper Hunter Valley attest to a short but intense period of Aboriginal-European conflict between late 1825 and mid-1827, with the conflict here, as in many other parts of NSW and Australia more broadly, characterised by a series of 'incidents'[2], each linked to a particular set of circumstances (Dunn, 2015: 189).

Dunn (2015), drawing on the results of an exhaustive review of Aboriginal-European relations in the Hunter Valley between 1820 and 1850, has identified an October 1825 incident on James Greig's farm 'Martindale', south of present-day Denman, as the 'opening act' of the short but intense period of conflict referred to above. On the 28th of October 1825, two settlers, Mr Forsyth and Mr Allen, called at James Greig's farm for breakfast only to discover what they believed to be Greig's dead body on the floor of his hut, as well as his convict servant missing, presumed dead (The Australian, 10 November 1825: 3). The deceased, as it was later confirmed, was actually Greig's cousin, Robert Greig, whom the former had charged with tending to his property and livestock while in Sydney on business. Newspaper reports at the time provided no obvious cause for Greig's killing, though local magistrates sent to investigate raised Greig's known aversion to Aboriginal people as a potential motive (Scott and McLeod to McLeay, 3 October 1826, HRA, Vol. 12: 610).

James Grieg himself, writing to this brother in Scotland the following year, said he could not tell the exact cause of the attack but noted that he had been informed by a friendly Aboriginal man that Robert had beaten another Aboriginal man, which had "irritated the tribe he belonged to" and caused his "untimely end" (Greig 1826a). In letter to a friend, penned on the same day, Grieg explained the situation further, stating that "[a]lthough the black natives are by no means hostile, [they] are always very revengeful when injured by any white person" (Greig 1826b).That Robert Greig's individual conduct was the motive for his murder was reinforced by Lancelot Threlkeld, who informed then Attorney General, Saxe Bannister, that he had heard that Grieg had struck the Aboriginal man and driven his party from the property (Gunson (ed), 1974: 91). Cunningham's (1827: 36-37) account of the incident identifies an Aboriginal man named Nullan-Nullan ("the beater") as the perpetrator, with Cunningham describing how Nullan-Nullan, after approaching in a friendly manner, had "glided behind" Grieg and killed him with a single blow to the back of the head. Upon killing Greig and plundering the hut, Nullan-Nullan and his party are reported to have withdrawn southward, into the mountains, with Cunningham (1827: 37) and magistrates Scott and McLeod describing this action as a retreat made in fear of European retaliation (Scott and McLeod to McLeay, 3 October 1826, HRA, Vol. 12: 610). An attack on two European shepherds in the Putty area, one of whom was killed, followed soon after, and prompted the colonial authorities to send a party of soldiers from Windsor to Putty to apprehend the individuals involved. In a clear escalation of violence, the soldiers intercepted and killed several members of what would later be determined to be a friendly Aboriginal group (Cunningham, 1827: 38-39).

[2] Often violent in nature

Although linked to the attack on Grieg's property by Cunningham (1827), available sources suggest that the Putty attacks were, in fact, rooted in events that occurred several years earlier. In an 1839 letter to magistrate Robert Scott, George Bowman of 'Archerfield', near Singleton, recounted how the two men attacked at Putty had played a central role in Governor Macquarie's 1816 punitive military expedition along the Hawkesbury-Nepean River, which would see at least 14 Aboriginal men, women and children massacred at Appin (the so called 'Appin massacre'). Bowman, whose reminiscences of Aboriginal-European conflict in the Hunter Valley were requested by Scott, described the situation as follows:

> *In 1825 a party of Natives from Richmond and another from the Hunter met at Putty on the old Hunters River road and killed one man and left the other as they supposed dead, but who was found by Mr. G. Bowman's overseer and men when driving his sheep to the Hunter, in a speechless state, his head crawling with wormes in the wounds received from the Blacks.*
>
> *This murder was supposed and believed to be true, from information received from other Natives, to have taken place through those two men having been instrumental in having some of the natives apprehended in 1816 or 17, when Governor Macquarie offered the reward for and outlawed by his proclamation. The Natives were not allowed to carry any warlike instruments within a certain distance of any White Man's Dwelling on pain of being dealt with according to Martial Law. The military did not attempt to take the Blacks and make prisoners of them, but shot all they fell in with and received great praise from the Government for so doing.* (Bowman to Scott, 5 January 1839, Indigenous Peoples File: Correspondence on Black Natives, Upper Hunter 1826, Singleton District Historical Society)

In June 1826, colonial authorities, responding to various "acts of violence" in the 'upper districts' of the Hunter[3], deployed ten soldiers, with accompanying bush constables, inland from Newcastle. Several Aboriginal men suspected of involvement in recent robberies and attacks were captured in turn. However, all managed to escape (Scott and McLeod to McLeay, 3 October 1826, HRA, Vol. 12: 611). An attack on George Forbes' Edinglassie estate around the same time saw one of the settler's Merino sheep killed, a shepherd in his employ speared through the shoulder and a hut on the property plundered[4]. In their report to the Colonial Secretary, magistrates Scott and McLeod note that an Aboriginal man, known as Billy, was subsequently apprehended for his involvement in the raid and jailed in Newcastle.

Shortly after the raid on Forbes' property, a stockman working on the Ravensworth estate of James Bowman, located around 25 km south-west of Edinglassie, was attacked and stripped naked, with the same individual killed two days later. A raid on James Chilcott's farm, located on Fal Brook, a few kilometres east of Bowman's estate, followed only days later, with Scott and McLeod reporting the involvement of the "same Natives", who "attempted by force to plunder the house" before being repelled (Scott and McLeod to McLeay, 3 October 1826, HRA, Vol. 12: 611).

To assist the troops already deployed to the region, on 24 June 1826, Governor Darling ordered a detachment of Mounted Police, commanded by Lieutenant Nathaniel Lowe of the 40th regiment, to the region (Chaves, 2007: 130). Shortly after Lowe's arrival in the valley, The Australian reported that "the natives who lately committed such havoc among the stockmen …retreated to the other side of the mountains" (The Australian, 24 June 1826). Regardless, continued Aboriginal threats of further raids prompted the deployment of additional troops to support Lowe, with the killing of Aboriginal people commencing in July (Chaves, 2007: 130). Scott and McLeod, for their part, report the shooting of four individuals, one of whom was deemed responsible for the death of Dr Bowman's stockman. All were shot while in custody (Scott and McLeod to McLeay, 3 October 1826, HRA, Vol. 12: 611).

[3] Alongside the murder of Grieg, Scott and McLeod's report to Colonial Secretary McLeay refers to "several petty robberies" on the road above James Bowman's Ravensworth estate, as well as raids on the farms of Peter McIntyre (Segenhoe) and Francis Little (Invermien), with McIntyre reportedly pursuing the raiders until forced to retreat.

[4] Note that soon after the raid on Forbes' property, local magistrate William Ogilvie, accompanied by a "friendly" Aboriginal man, was able to track down the raiding party and negotiate the return of items taken from the settler's hut.

By August 1826, rumours of Aboriginal people being killed in “peculiar circumstances” were starting to emerge from the region, with Threlkeld, for example, informing the Attorney General that Aboriginal people at the Bahtahbah mission, along with those arriving from the mountains, were reporting indiscriminate shootings and hangings, as well as the massing of bands of warriors in the mountains for a wide-scale attack across the valley (Gunson (ed), 1974: 92). Upon hearing the rumours, and conferring with Captain Allman at Newcastle, Governor Darling ordered an investigation by local magistrates Scott and McLeod, who prepared their report for his review (Scott and McLeod to McLeay, 3 October 1826, HRA, Vol. 12). Despite his earlier instructions from Lord Bathurst to oppose hostile Aboriginal incursions across the Colony with force and his belief, in this particular arena, in the “criminality of the natives”, Darling made it clear that “the massacre of prisoners in cold blood” was unacceptable “as a measure of justifiable policy” (Darling to Bathurst, 6 October 1826, HRA, Vol. 12: 623). Unsatisfied with the level of information provided by Scott and McLeod, Darling would soon order a second investigation into Aboriginal-European hostilities in the Hunter, which was undertaken by Scott and another local magistrate, E.C. Close. As part of this second investigation, Lowe and others, including local settlers John Larnach of “Rosemount” and James Glennie of “Dulwich”, provided depositions in which they outlined their own versions of events. These depositions document various acts of violence against Aboriginal people, including multiple shootings, with those deposed invariably framing such incidents as justifiable responses to attempted escapes (see Dunn, 2015: 202-204).

In contrast to the ‘sanitised’ depositions of Lowe and his party, other contemporary sources paint a much darker picture of the unfolding conflict (Dunn, 2015: 204). In an August 1826 letter to Saxe Bannister, for example, Threlkeld described how, upon visiting one of the two fencers attacked on James Bowman’s property in Newcastle hospital, he was informed by the fencer that Lowe’s troops had captured and summarily executed an Aboriginal man who, while part of the group involved in the attack, was not involved in physically injuring him (Threlkeld to Bannister, 21 August 1826). Ultimately, inconsistencies in Scott and McLeod’s initial inquiry, coupled with obfuscations in Scott and Close’s second inquiry, prompted Governor Darling to order a third investigation, which saw Acting Attorney General W.H. Moore travel to Newcastle and Wallis Plains in January 1827 (Dunn, 2015: 205). As part of his inquires, Moore sought Threlkeld’s opinion on the situation, who informed him, on the basis of information provided by his own Aboriginal informants, of three troubling incidents. These included the execution of a man, reportedly later identified as Jackey Jackey (not to be confused with the Jackey Jackey who accompanied explorer Edmund Kennedy on his expedition to Cape York Peninsula), at the gaol in Wallis Plains, the shooting of an escapee near the Hunter River and a macabre shooting / hanging on James Bowman’s Ravensworth estate (Gunson (ed), 1974: 95).

By mid-July 1826, Lowe’s actions in the valley appear to have subdued Aboriginal peoples’ resistance activities. In a letter to Lieutenant De La Condamine, penned on 18 July 1826, Captain Allman informed his superior that “no acts of violence have been committed by the Aborigines in this District from some weeks past; and, from the preserving exertions of Lieutenant Lowe and his Detachment, there is every reason to hope for permanent tranquillity” (Allman to De La Condamine, 18 July 1826, HRA, Vol. 12: 622).

Hostilities, however, soon resumed, with August 1826 witness to two major incidents, the first occurring on William Ogilvie’s Merton estate and the second on Captain Robert Lethbridge’s Bridgman estate at Fal Brook. That on Ogilvie’s property, which ended without bloodshed, saw around 200 painted and armed warriors, led by an Aboriginal man known as Jerry, approach the farm, their presence prompted by two recent on-property incidents involving the wrongful detainment of Jerry and, earlier, two boys named Tolou and Mirroul[5] (Wood, 1972: 121-123).

[5] Tolou and Mirroul, whose European names were Ben and Denis, had been arrested at Merton in mid-August, allegedly for the spearing of cattle. Both were transferred to Newcastle goal on 16 August 1826.

The confrontation at Merton, which would see Mary Ogilvie and her second son, Edward, who had learnt the local language, deescalate a potentially violent situation, is described in detail in Mrs Ellen Bundock's (1932) memoir of her childhood at Merton:

> *Amongst my recollections of my childhood was playing with my brother Fred outside of the house when on looking up we suddenly saw the whole hill covered with Blacks all armed to the teeth except the King or Chief Jerry who was most amicable to us - a fine dignified looking man. He was clothed in an opossum skin rug and strips of fur round the loins – he kept shaking hands with each of us in turn to convince his subjects that he was on friendly terms with us. Our father was absent in Sydney just then so our Mother was alone with us children and only a few convicts about the place. The only weapon the Chief had was a Waddy stuck in his belt which was worn on all occasions by the natives. He kept going amongst the other blacks trying to quiet them and last they filed away over the hills to our inexpressible relief having only taken a little corn from a shed at hand and having shaken all of the Constable's rations on the ground.*
>
> *The cause of all this trouble and of the Blacks anger was an act of treachery committed by the Constable and soldiers who were left for our protection and who were placed under our Mother's orders. These soldiers had persuaded some of the Blacks to come to Merton under pretence of seeking guides to go after the Bush rangers but when the Blacks came they seized two of them (our chief Jerry and another man) believing that this Jerry was a murderer of the same name for whom a reward was offered. Our Mother…had seen the Constable and soldiers struggling with two Blacks, one of whom escaped and the other they forced into the hut. She…insisted on seeing the Black they had shut up who proved to be Jerry our Chief and on our Mother's declaring who he was and that he was not the murderer the soldiers released him, but fearing the indignation of the Blacks at their treacherous dealing with them they deserted us, clearing away in the night and leaving us to reap the consequences of their bad conduct which might have resulted in the loss of all our lives…[T]he blacks said to the last that if they had found the constable and soldiers they would have murdered them all for their treachery.*

Contemporary accounts of the incident at Merton are full of praise for Mrs Ogilvie's conduct. The Australian, for example, applauded her "great degree of resolution" (The Australian, 9 September 1826: 3), while Governor Darling reported to London that Mrs Ogilvie "had acted with much judgement and spirit" (Darling to Hay, 9 September 1826, HRA, Vol. 12: 574). Cunningham, too, referred to Mrs Ogilvie's actions as "[a] fine instance of intrepidity". While Mary and Edward Ogilvie's actions were undoubtedly brave, as Dunn (2015: 209) has observed, the crisis at Merton also highlights "the intimate nature of the frontier", with the Ogilvie family's personal friendship with Jerry and Edward's knowledge of the local language serving to defuse what could well have been a deadly confrontation.

Unlike that at Merton, the incident at Robert Lethbridge's Bridgman estate would involve significant bloodshed and precipitate what is colloquially known as the 'Ravensworth massacre'. On 28 August 1826, a group of approximately 15 Aboriginal men gathered at the hut of Richard Alcorn, overseer for Lethbridge's Bridgman estate. Alcorn's hut was situated on Fal Brook, around half a mile upstream from Dulwich, the homestead of James Glennie and around a quarter of a mile from James Chillcott's hut, which had, as noted above, been recently raided. Alcorn's wife, Charlotte, is reported to have offered the group some kangaroo to eat, which they took and roasted on a nearby fire (Deposition of John Woodbury, 29 August 1826, HRA, Vol. 12: 613-614).

The warriors also requested maize and bread but were told that there was none. A few of the assembled warriors entered the hut though none showed any signs of violence. Around 4pm, Alcorn returned to the hut and was reportedly unsettled by the presence of so many armed warriors, three of whom he recognised as being involved in the raid on Chilcott's farm. After discussing the situation with John Woodbury, a stockman of Thomas Cullen who was present at the hut, the two men ordered the group to leave. This order, according to Woodbury's testimony, sparked a fierce attack by the assembled warriors, which ultimately resulted in the wounding of Woodbury and Alcorn and the deaths of two other Europeans, Henry Cottle and Morty Kernan. After raiding adjoining workers' huts for bedding and blankets, the warriors are said to have retreated into the bush (Deposition of John Woodbury, 29 August 1826, HRA, Vol. 12: 614). Mounted troops alerted to the unfolding incident pursued the group the same day but were unable to locate them.

Robert Scott, the nearest magistrate, arrived at Alcorn's hut the following day and concluded that the warriors involved were not those involved in other incidents in the district, though Woodbury identified four by name, including three he believed to have been involved in the attack on Chilcott's farm (Deposition of John Woodbury, 29 August 1826, HRA, Vol. 12: 614; Deposition of Robert Scott, 30 August 1826, HRA Vol. 12: 615). Scott was quick to organise a posse to track down the group involved and three days later, approximately 20 miles (32 km) from Alcorn's hut, "came up with the murderers" (Scott and McLeod to McLeay, 3 October 1826, HRA, Vol. 12: 612). According to Scott and McLeod's brief account of the event, a 'skirmish' ensued, with one European speared in the face, two Aboriginal warriors killed and "some more" wounded. However, a more detailed account of the event in The Australian, published on 23 September 1826 and reproduced in part below, listed the number of Aboriginal dead at 18, with two others reportedly taken into custody:

> *Further particulars have been communicated to us of the fight with the blacks in the district of Hunter's River. It appears that as soon as it was made known that the black fellows had committed the outrage on Mr. Lethbridge's farm, three of the Mounted Police, accompanied by Mr. Scott and some prisoners, and some friendly natives, set out in quest of them. Having continued the pursuit for some time, they at length discovered their tract, and afterwards lost it, but on the following day they were fortunate enough to fall in with it again, and by die light of fires which the hostile tribes kindled towards evening, the precise spot they occupied was soon ascertained. Two men, one a white man, and the other a black, were sent forward to reconnoitre their position, &c. and as they came suddenly upon them they were descried by the party of blacks, who immediately set up the cry "Kill white man." Upon this the two being each provided with a musket (the blacks are good shots, we are informed) fired among them, and then retired behind trees to reload. At this moment a spear was hurled which struck the native black on one side of the face, pierced his cheek, and protruded through the opposite cheek, having passed curiously enough through a hollow in the mouth, occasioned by the loss of a tooth! The remainder of the pursuers hearing the firing, hastened to the spot, and as the whole of them, mounting probably to about sixteen, were furnished with muskets — they discharged these among the sable enemy. A hot conflict followed, the natives maintaining their ground, and making the most dexterous use of their spears. At last they were obliged to yield, betake themselves to flight, leaving behind them about eighteen of their comrades who were numbered with the dead. A man and his gin were taken prisoners. The attacking party sustained no loss of lives.* (The Australian, 23 September 1826)

As with most incidents of conflict in the mid-to-upper Hunter, the exact location of the Ravensworth massacre site remains unclear. Gollan (1993), for her part, has argued that the Mount Arthur area is the most likely place for the massacre to have taken place. According to Gollan, this area was the only portion of the upper Hunter that had not been taken up by European settlers by this time and likely functioned as a 'bastion' for post-contact Aboriginal occupation (Figure 3). A contemporary reference[6] to the Aboriginal warriors involved in the attack retreating to the "mountains" is likewise deemed indicative by Gollan, as is the Mount Arthur area's 'strategic' location with respect to launching the kinds of attacks witnessed up to that point (Figures 4 and 5). Contra Gollan's interpretation, Umwelt's (2004) analysis of the incident, undertaken as part of an Aboriginal heritage assessment for the Glendell Open Cut, casts doubt on the suggestion that the massacre took place to the west of Alcorn's hut (i.e., "up" valley, towards Mount Arthur). As Umwelt (2004) explain, contemporary accounts of the incident imply:

> *…that the Aboriginal people that took part in the attack came from the mountains and were returning to the mountains when the reprisal attack (massacre) took place. The account by Scott and MacLeod (HRA XII 1826: 612) also suggests that at least one woman was included in the Aboriginal group attacked. If the Aboriginal attackers had travelled 20 miles (approximately 32 kilometres) in the direction of the mountains (or even into the mountains) they could have travelled in a northerly or easterly or (less likely) southerly direction from Bridgman Farm. There are no mountains in a westerly direction (and no significant range to the south). A westerly direction would have taken the fleeing Aborigines and their pursuers up the valley rather than into the mountains. If the Aboriginal people that attacked the hut at Bridgman Farm travelled towards the mountains they would have travelled away from the area now proposed for the Glendell Open Cut. Thus, the massacre site is highly unlikely to be located within the Glendell ML or within the Ravensworth Estate. Even if the Aboriginal people had travelled in an easterly direction they would have passed through the area of the present Glendell ML and the Ravensworth Estate by the time they had travelled 7 miles, rather than the 20 miles they were reported as travelling prior to the pursuing party catching up with them.*

In common with Umwelt (2004), other, more recent considerations of the massacre (e.g., ACHM, 2013; Dunn, 2015) have placed it outside of Bowman's Ravensworth estate. Dunn (2015), whose exhaustive review of Aboriginal-European hostilities in the Hunter Valley remains one of the most detailed studies of its kind for the region, has mapped it as occurring in mountainous terrain to the northwest of Alcorn's hut (Figure 6). ACHM, meanwhile, have prepared a map which shows an approximate area where the massacre cannot have occurred (ACHM, 2013: 69, Map4-1). While this map allows for the possibility that the massacre could have occurred within the Mount Arthur area, on the basis of available evidence, this seems unlikely.

[6] The Sydney Gazette and New South Wales Advertiser, 9 September 1826:3

Figure 3 Map of the Hunter Valley showing European landholdings up to 1825. Estates of relevance to incidents of Aboriginal-European conflict between 1825 and 1827 marked with arrows and labelled (modified from Campbell, 1926)

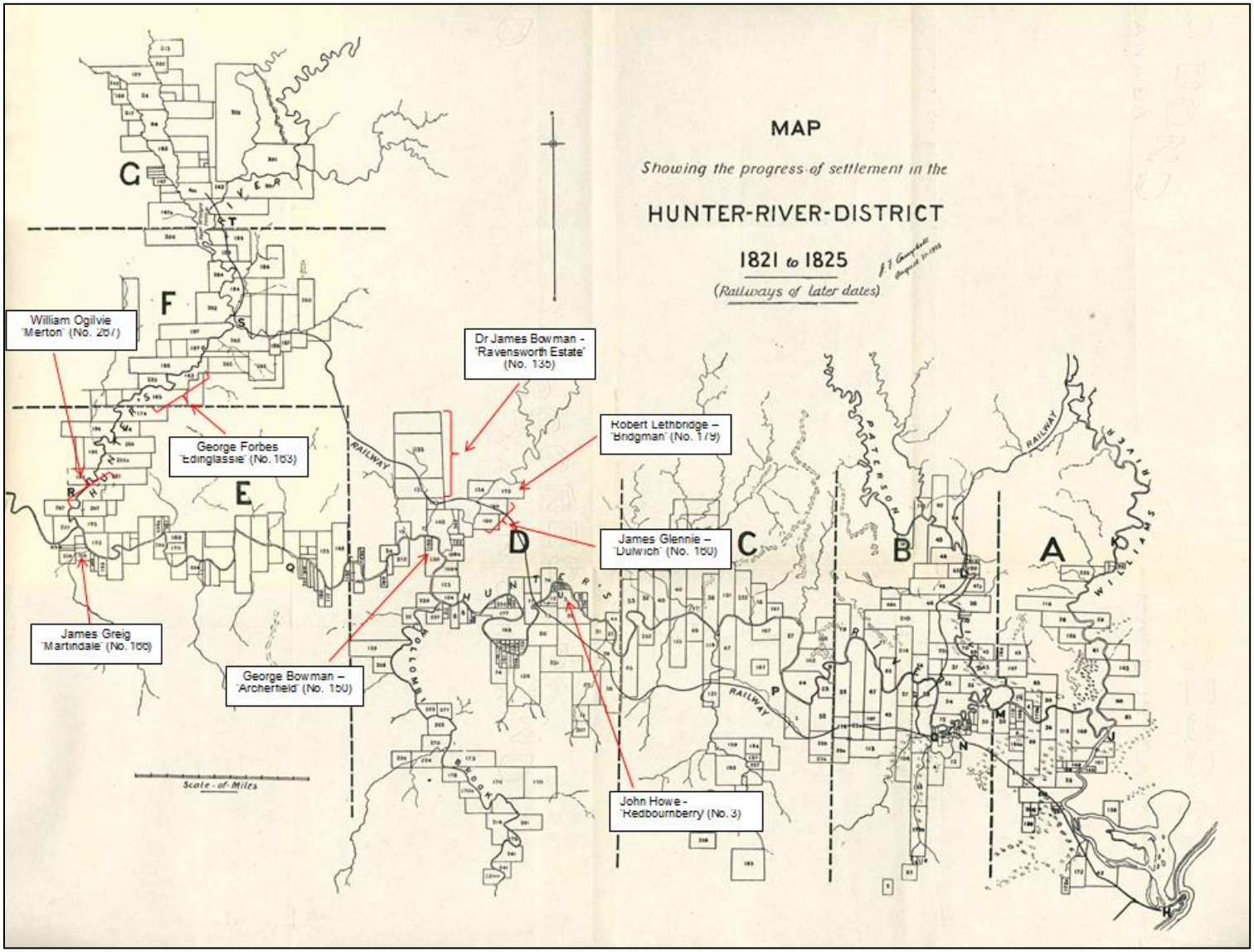


Figure 4 Gollan's (1993) map of land unsettled by Europeans in 1826 (from Gollan, 1993: Map 1)

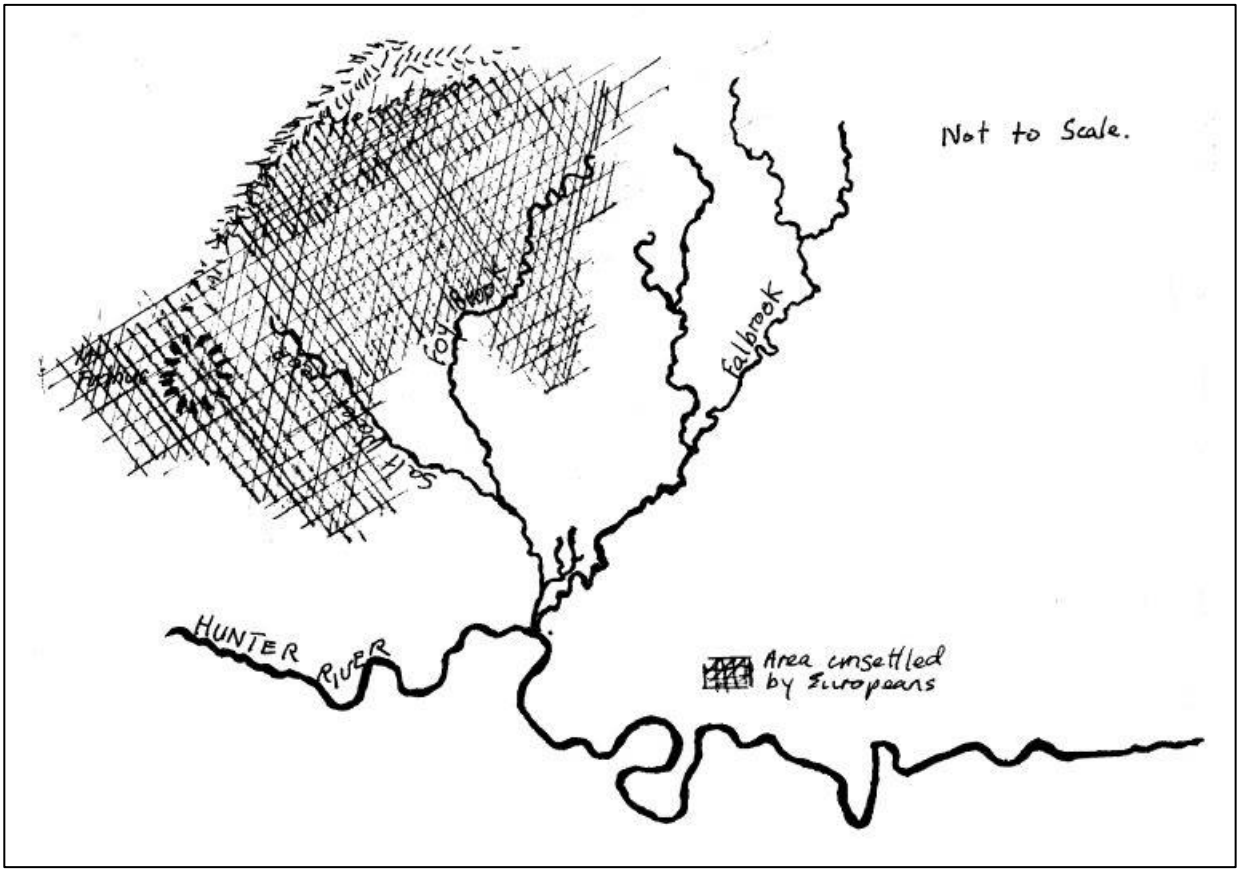


Figure 5 Gollan's (1993) map of Aboriginal 'attacks' leading to the Ravensworth massacre (from Gollan, 1993: Map 3)

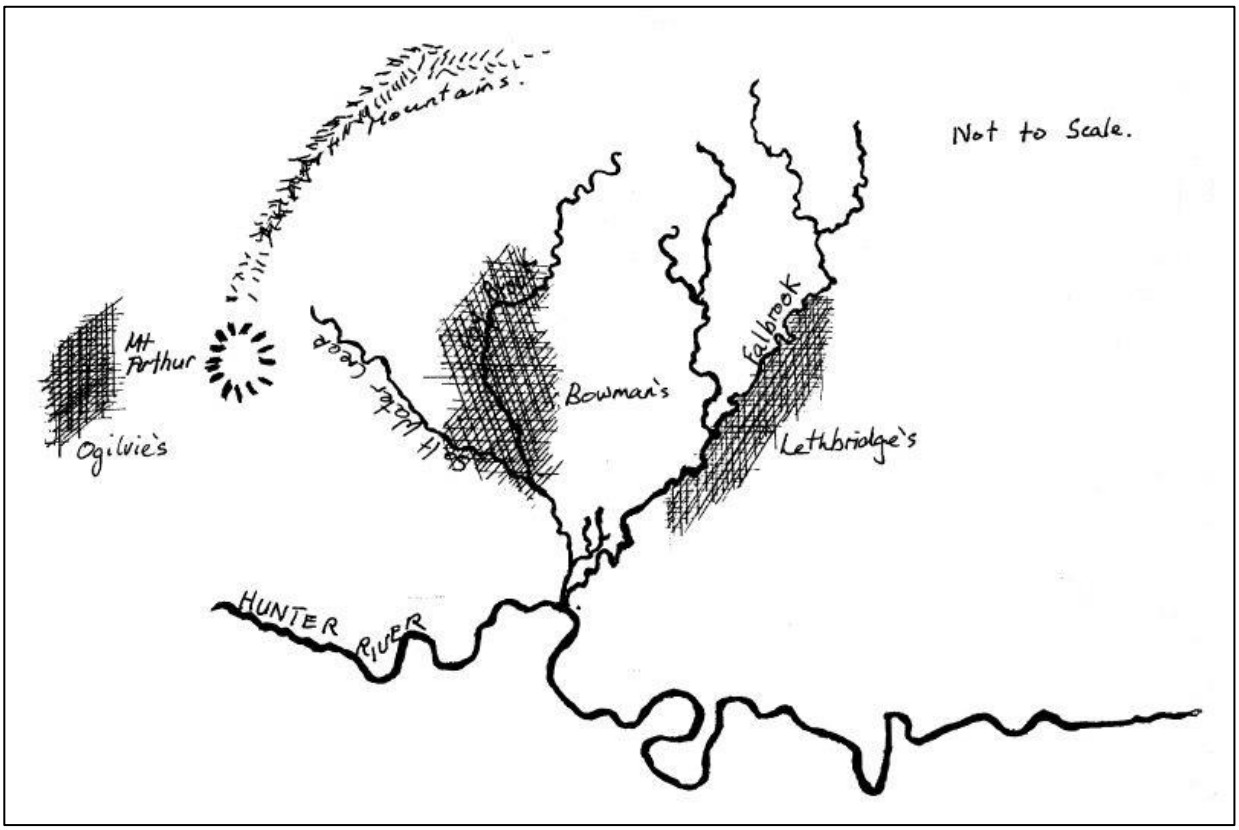
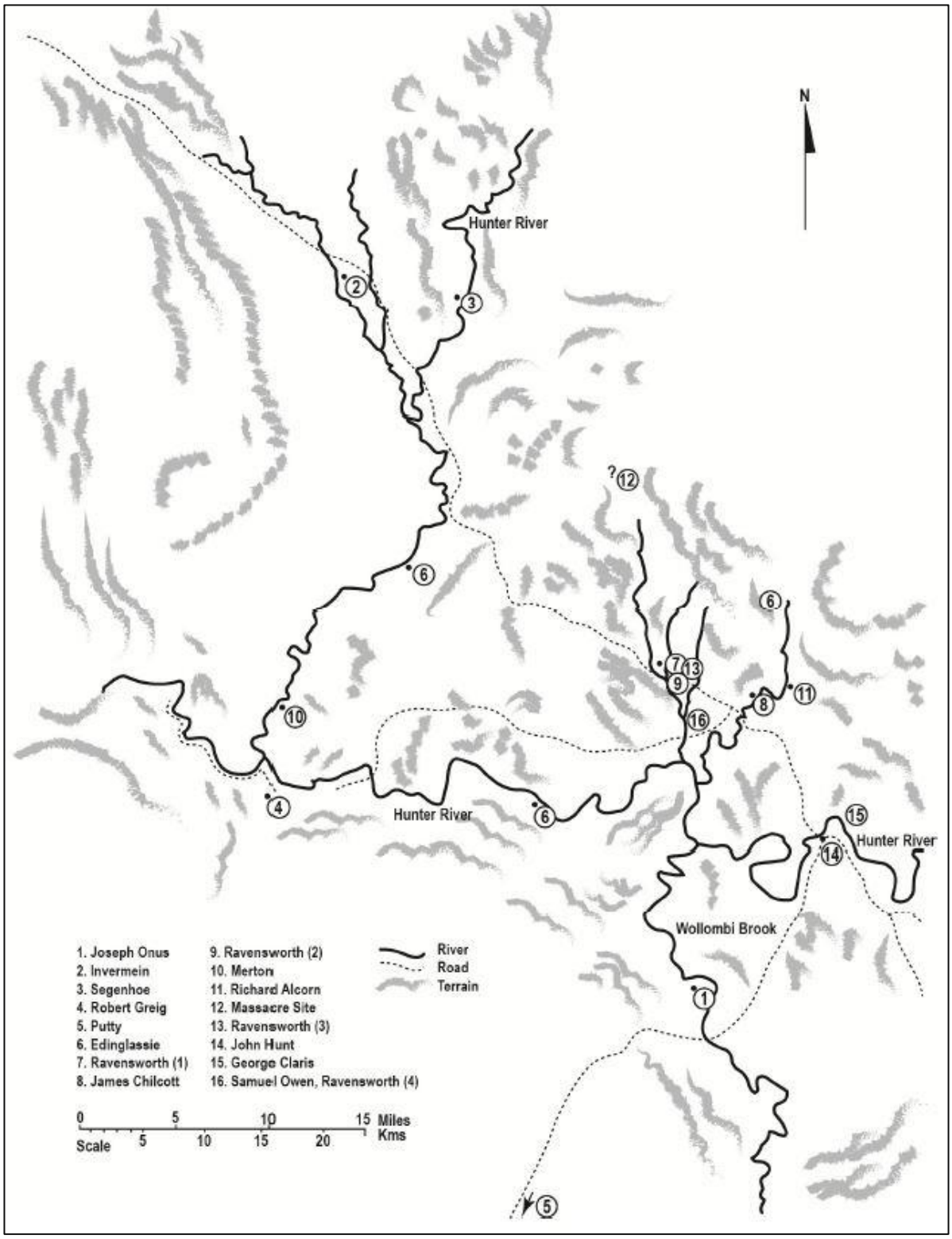


Figure 6 Map showing the location of reported incidents of Aboriginal-European conflict in the Hunter Valley between 1825 and 1827, including the 'Ravensworth massacre' (from Dunn, 2015: 228, Fig. 16).



By September 1826, tensions in the mid-to-upper Hunter had reached fever pitch, with various contemporary observers, such as Threlkeld and Robert Scott's brother, Helenus Scott, talking of war (see Gunson, 1974: 93; Helenus Scott to Augusta Scott, 25 September 1826, Scott Family Correspondence, ML). Fears of Aboriginal attacks amongst the settler population were such that on the 4th of September 1826 a group of concerned landholders, including James Bowman, Peter McIntyre and William Ogilvie, petitioned Governor Darling to maintain the Mounted Police's presence in the district:

May it Please Your Excellency,

We, the undersigned, Landholders at Hunter's River's river, beg leave most respectfully to represent to Your Excellency the present very disturbed state of the Country by the incursions of numerous Tribes of Black Natives, armed and threatening death to our Servants, and destruction to our property.

We are fully impressed with the intentions of Your Excellency by ordering the protection of the Horse Patrole; at this moment; we have received information that some of the Soldiers are withdrawn to attend an Investigation at Newcastle on a subject connected with the marauding conduct of the Natives.

We most humbly trust Your Excellency will take this into Your consideration, either by ordering others to take their places, or by suspending the order of their recall to Newcastle, until the threats and murderous designs of the Natives shall have subsided; for, in the event of our losing the protection of the Troops, our property will be exposed to the revenge and depredation of these infuriated and savage people.

The Natives lately burnt all the grass on the several Farms, killed some Men, have speared several Cattle, and threatened to destroy the Wheat of the ensuing Harvest.

We have, &c.,

J.Bowman J.H. Winder.

Peter McIntyre David Maziere

A.B. Spark William Ogilvie

Leslie Duguid, H. Malcom

J. Gaggin. John Brown

John Cobb

(Landholders to Governor Darling, 4 September 1826, HRA, Vol. 12: 576)

As highlighted by Dunn (2015: 217), this petition had arisen from Governor Darling's decision to withdraw Lowe and his troops from the district and his ordering of the second inquiry into the actions of the Mounted Police under Lowe's command. The landholders involved were unlikely to have been impressed with Darling's response, with the Governor urging the settlers themselves to unite and adopt "vigorous measures" to establish their "ascendency" over the district's Aboriginal population (Darling to Landholders at Hunter's River, 5 September 1826, HRA, Vol. 12: 576-577). In a closing rebuke, the Governor felt it necessary to point to out the fact that not one of the petitioners, all of whom were based in Sydney, were physically present in the district to witness any of the outrages they were reporting. As hinted at by the signatories themselves, whose petition contains the word 'revenge', the closing sentences of Darling's response, reproduced below, point not to indiscriminate violence on the behalf's of the district's Aboriginal population but rather to retaliatory strikes:

As you very properly attach much importance to the preservation of your property, I would remark that your presence and personal example would tend to this object than any measure of the Government. It would have the effect of preventing irregularities on the part of your own people, which I apprehend is in many instances the cause of the disorders committed by the Natives. (Darling to Landholders at Hunter's River, 5 September 1826, HRA, Vol. 12: 577)

Attorney General Saxe Bannister, for his part, urged Governor Darling to deploy the military to the district, claiming that those "interested upon Hunter's River" would be best served by a show of "overwhelming force" (Bannister to Darling, 5 Septmber 1826, HRA, Vol. 12: 577). Bannister suggested the declaration of martial law, as had occurred in Bathurst in 1824, proposing that this would not only reinforce the government's determination to resolve the matter but also provide legal protection for any soldiers sent to the district. Darling would subsequently dismiss Bannister's call for martial law, informing the Attorney General that the size of the district's settler population was such that the threat posed by the 'natives' was a minor one.

The war feared by Threlkeld and others was not to eventuate. Nonetheless, hostilities continued throughout the remainder of 1826 and first half of 1827, with notable incidents from this period including the November 1826 abduction of the 20 month old daughter of John and Catherine Hunt[7], an act attributed to an Aboriginal man known to Europeans as 'Bit-O-Bread' (Byirbyrry), and a bloodless March 1827 confrontation at George Claris' hut on John Howe's Redbourneberry estate, near Singleton, the primary motivation for which appears to have Byirbyrry's anger at being accused of the kidnap of Hunt's daughter. "King" Jerry, who was present with Byirbyrry at Claris' hut, is said to have warned Claris that any harm to Byirbyrry would result in him amassing 1000 warriors to kill any European they encountered. Outside of the Hunter Valley, the first half of 1827 would also bear witness to the Supreme Court trial of Lieutenant Lowe for the August 1826 murder of Jackey Jackey at Maitland Gaol, with Lowe, perhaps predictably, acquitted of the crime (for a detailed review of Lowe's trial see Chaves, 2007).

The accounts of Dunn (2015) and others (e.g., Miller, 1985; Wood, 1972) point to a significant reduction in the scale of Aboriginal-European conflict in the mid-to-upper Hunter from mid-1827. Attacks and confrontations continued to occur. However, the high point of conflict had passed, with the majority of 'prime' land within the region now firmly in European hands[8]. Despite this stranglehold, Aboriginal 'returns' from 1827 onward attest to the continued presence of relatively large numbers of Aboriginal people in the region. Data of relevance to the mid-to-upper Hunter is summarised in Table 3 below, with examples of returns for the Patrick's Plains, Merton, and Wallis Plains districts, provided in Figures 8 to 13. As indicated in Table 3, despite several years of European occupation, 'early' (i.e., 1827-1829) returns for the mid-to-upper Hunter indicate a total Aboriginal population well into the hundreds.

Returns for the mid-to-upper Hunter also provide insight into the social and territorial organisation of the Aboriginal groups occupying this region around the time of European colonisation. While acknowledging the well-documented problems surrounding early European observers' use of the word 'tribe', with many tribal names, for example, comprising European inventions, a number of existing returns for the mid-to-upper Hunter contain the names of individual 'tribes', with places or districts of 'usual resort' sometimes also specified. For the mid-to-upper Hunter, a review of returns prepared for districts[9] and estates within this region (e.g., Patrick's Plains, Wallis Plains, Segenhoe, Invermein and Merton) reveals marked differences in the amount of information available regarding group names and associations. Returns for the Merton district, for example, contain almost no useful information[10], with only one return, prepared in July 1844, containing an Aboriginal group name, the 'Gnarnical' or 'Gnarnoical', which is likely an alternative spelling of 'Gundical'. The Gundical, according to Edward Ogilvie, son of magistrate William Ogilvie, were one of the four 'tribes' that made up the Gummun Kamilaroi of the Upper Hunter - Goulburn River valleys, with the remaining three groups consisting of the "warlike" Marawancal, the Toolomm-pikilal and the "fine Intelligent" Panin-pikilal (Wood, 1972: 137).

[7] John Hunt served as a district constable at Patrick's Plains

[8] Note that Miller (1985: 42) has suggested that, post-1830, the majority of Aboriginal resistance to European colonisation of the Hunter Valley was passive, as opposed to armed, in nature.

[9] Note that the physical extent of historically-documented districts or localities within the mid-to-upper Hunter (e.g., Patrick's Plains, Wallis Plains, Merton) remains poorly defined, with the project area arguably located at the eastern extremity of the Merton district.

[10] As William Ogilvie himself remarked in his April 1827 return: "[T]he Black Natives are very numerous here, but I am not able to distinguish their tribes, nor do I think they are distinctly separated into tribes but assemble in larger or smaller parties according to the object they have in their view – certainly they have no distinct chiefs..."(Ogilvie to McLeay, 22 April 1827, SRNSW 4/2045)

In general, returns for the Patrick's Plains district are the most informative for the region, with James Glennie's August 1829 return (Figures 10 to 12), for example, identifying four distinct 'tribes' within this district; namely, 'The Plains Tribe', 'The Bulcara Tribe', 'The Micarrawillung Tribe' and the 'Kinkigyne or Hungary Hill Tribe'. Glennie's return also contains the European and Aboriginal names of all of the men in each group, including their respective 'kings'. Places of usual resort for the groups listed are not specified. However, it is noted that a June 1834 return for the district (Figure 13) places the 'Kinkigyne or Hungary Hill Tribe' at Fal Brook. Moving further up the valley, Francis Little's June 1828 return lists two 'tribes' within the district under his jurisdiction: the 'Tullong Tribe' and the 'Murawin Tribe', with Little placing the Tullong in the Dartbrook area and the Muarwin along the Paterson and Pages Rivers (Figures 15 and 16). Peter McIntyre's December 1829 return for Segenhoe, in contrast, contains no useful information with respect to group names and localities.

Table 3 Aboriginal returns for districts and estates in the mid-to-upper Hunter valley between 1827 and 1844 (data compiled from originals / facsimiles held at the State Archives of New South Wales, [4/2045], Reel 3706)

Year	Date(s)	District	Record taken at	Recorder(s)	Total # of people	Tribal affiliation	Place / district of usual resort	Comments
1827	17-Apr	Patrick's Plains and Luskintyre	-	Scott and McLeod	c. 300	-	Patrick's Plains and Luskintyre including all Wallumby Brook [Wollombi] Brook] and extending westward as high up the River as Dr Bowman's and William Bells Farm"	Recorder refers to the inability to accurately measure numbers, stating they will have a better idea of numbers once they have distributed clothing
1827	22-Apr	Merton	-	William Ogilvie	Up to 300	-	Between Bylong/Mudgee and Liverpool Plains	Recorder refers to the inability to accurately measure numbers
					100	-	Upper hand of the River (Upper district)	Recorder refers to the inability to accurately measure numbers
1827	2-Jul	All districts	-	Colonial Secretary's Office	c. 300	Patrick's Plains and Luskintyre	Patrick's Plains and Luskintyre	-
1827	2-Jul	All districts	-	Colonial Secretary's Office	c. 100	Hunters River	Hunters River	-
1827	2-Jul	All districts	-	Colonial Secretary's Office	c.120	Wallis Plains	Wallis Plains	-
1828	6-May	Wallis Plains	-	A Robertson	95	Wallis Plains	-	-
					20	Wollambi	-	Only includes those individuals known, actual numbers are likely to be higher

Year	Date(s)	District	Record taken at	Recorder(s)	Total # of people	Tribal affiliation	Place / district of usual resort	Comments
1828	5-Jun	-	Invermien	Francis Little	39	Tullong	Dart Brook / Paterson and Pages Rivers	-
1828	5-Jun	-	Invermien	Francis Little	29	Murawin	Dart Brook / Paterson and Pages Rivers	-
1829	14-Apr	Wallis Plains	-	Samuel Wright	120	-	-	-
1829	4-Aug	Patrick's Plains	-	James Glennie	46	Plains Tribe	Patrick's Plains	"Not including the Wollomby Blacks or the Wild Blacks of each tribe" 'King': Black Boy/Pandoba
					11	Bulcara	Patrick's Plains	'King': Billy Bowman/Oonungoonung
					14	Micarrawillung	Patrick's Plains	'King': Jacky/Balboa
					28	Kinkigyne	Patrick's Plains	'King': Coori Jerry/Nimbue
1828	16-Apr	-	Segenhoe	Peter McIntyre	2	-	-	'King': Tom 'Queen': Maria
1828	10-Jun	-	Segenhoe	Peter McIntyre	3	-	-	-
1829	7-Apr	-	Segenhoe	Peter McIntyre	2	-	-	'King': Tom
1829	16-Jun	-	Segenhoe	Peter McIntyre	14	-	-	'Queen': Maria
1832	-	North and North Western Districts	-	-	30	-	Darlington / Patrick's Plains	-
					30	-	Merton	-
					40	-	Invermein	-
					100	-	Casillis	-

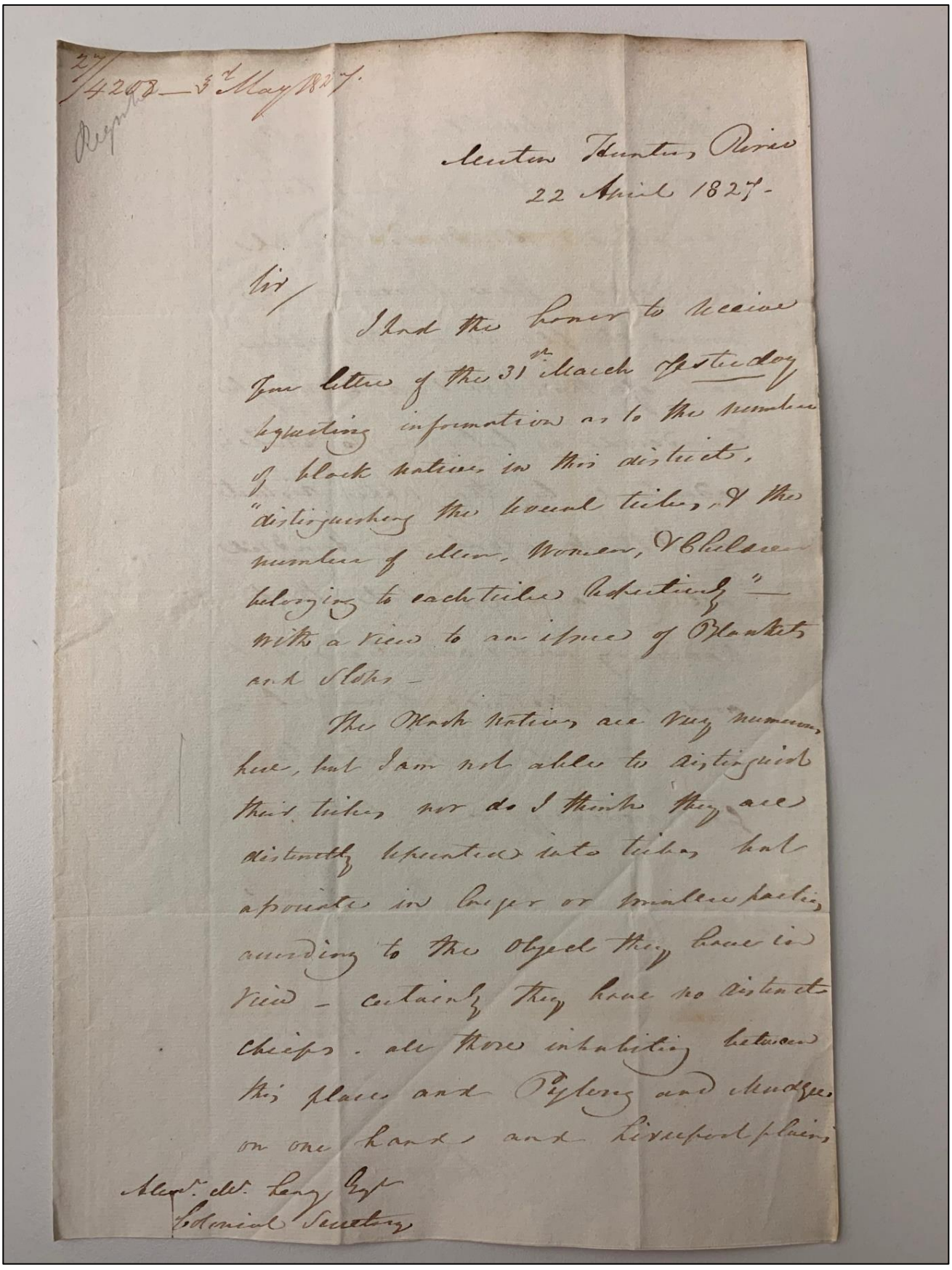
Year	Date(s)	District	Record taken at	Recorder(s)	Total # of people	Tribal affiliation	Place / district of usual resort	Comments
1833	-	North and North Western Districts	-	-	30	-	Darlington / Patrick's Plains	-
					30	-	Merton	-
					40	-	Invermein	-
					120	-	Casillis	-
1833	3-May	All districts	-	-	50		Maitland (including Patersons River and Wollombi)	-
					30	-	Darlington and Patrick's Plains	- -
					30	-	Merton	-
					20	-	Casillis	-
					40	-	Invermein	-
1833	29-May 5-Jul	Patrick's Plains	Bathurst	-	9	Patrick's Plains	Bathurst	-
1834	-	North and North Western Districts	-	-	55	-	Maitland including Paterson's Plains and Wollombi	-
					30	-	Darlington and Patrick's Plains	
					30	-	Merton	
					40	-	Invermein	
					35		Casillis	

Year	Date(s)	District	Record taken at	Recorder(s)	Total # of people	Tribal affiliation	Place / district of usual resort	Comments
1834	25-May	Merton	Merton	William Ogilvie Gregory Blaxland	30	Merton	Merton	-
1834	2-Jun	Patrick's Plains	Patrick's Plains	-	10	Hungary Hill	Fal Brook	-
					14	Patrick's Plains	Patrick's Plains	-
					10	Glendon	Glendon	-
1835	-	North and North Western Districts	-	-	70	-	Maitland, inc. Wollombi	Number of blankets not people
					30	-	Paterson	Number of blankets not people
					60	-	Darlington and Patrick's Plains	Number of blankets not people
					50	-	Merton	Number of blankets not people
					100	-	Invermein	Number of blankets not people
1837	6-Jun	Patrick's Plains	Patrick's Plains	-	11	Fal Brook	Fal Brook	-
					11	Plains Tribe	Patrick's Plains	-
					12	Glendon	Glendon Brook	-
1838	-	Patrick's Plains	Various	L.E.Threlkeld	15	-	Glendon	-
					15	-	Dulwich	-

Year	Date(s)	District	Record taken at	Recorder(s)	Total # of people	Tribal affiliation	Place / district of usual resort	Comments
					15	-	Patrick's Plains	-
					15	-	Wollombi	-
1838	-	Patrick's Plains	-	L.E.Threlkeld	64	-	-	Children not included in numbers
1842	16-May	Patrick's Plains	Singleton	-	18	Patrick's Plains	Patrick's Plains	'Chief' listed with English Name (Cobon Billy) and Aboriginal name (Congoa)
1842	25-May	Patrick's Plains	Glendon	-	14	Glendon	Glendon	-
1842	27-Jun	Patrick's Plains	Wollombi	-	10	Lower Wollombi	Lower Wollombi	-
1842	10-Aug	Patrick's Plains	Dulwich/Falbrook	-	15	KingsKine (Kinkigyne)	Fal Brook	-
1843	May	Patrick's Plains	Singleton/ Glendon/ Wollombi/ Falbrook	James Glennie	14	Patrick's Plains	Patrick's Plains	-
1843	May	Patrick's Plains	Singleton/ Glendon/ Wollombi/ Falbrook	James Glennie	11	Glendon	Glendon	-
1843	May	Patrick's Plains	Singleton/ Glendon/ Wollombi/ Falbrook	James Glennie	7	Wollombi	Wollombi	-
1843	May	Patrick's Plains	Singleton/ Glendon/ Wollombi/ Falbrook	James Glennie		Falbrook	Bridgman, Mount Royal, St Clair, Glendon Brook & 	-

Year	Date(s)	District	Record taken at	Recorder(s)	Total # of people	Tribal affiliation	Place / district of usual resort	Comments
1844	30-Jul	Merton	Merton	George Blaxland and William Ogilvie	16		Merton	Additional 20 individuals not listed as there were not enough blankets

Figure 7 William Ogilvie's April 1827 return for the Merton district, Page 1 of 2 (SRNSW, 4/2045)



27/4208 — 3d May 1827.
Reports

Merton Hunters River
22 April 1827.

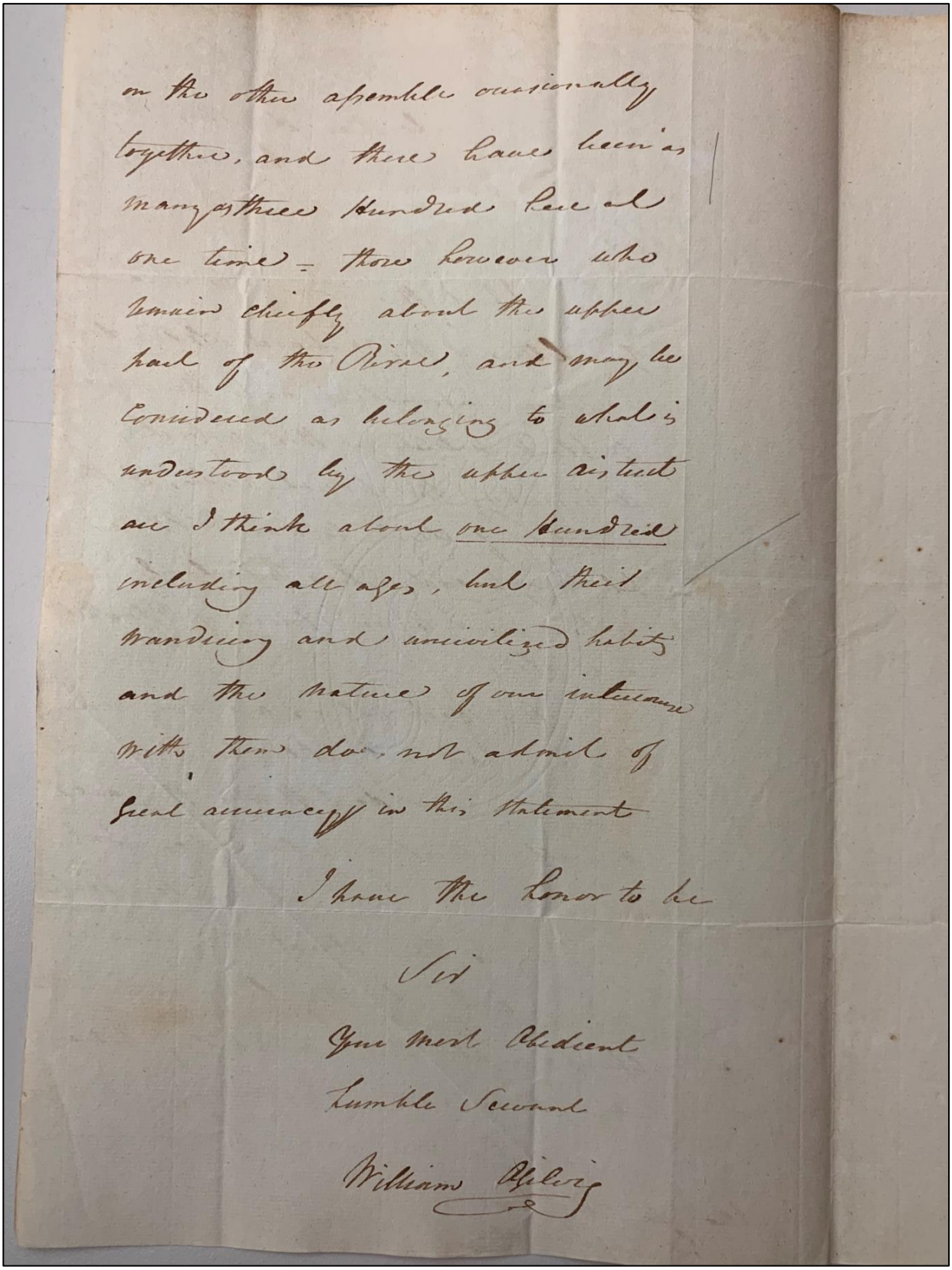
Sir,

I had the honor to receive your letter of the 31st March yesterday requesting information as to the number of black natives in this district, "distinguishing the several tribes, & the number of Men, Women, & Children belonging to each tribe respectively" — with a view to an issue of Blankets and Slops —

The Mash natives are very numerous here, but I am not able to distinguish their tribes nor do I think they are distinctly separated into tribes but assemble in larger or smaller parties according to the object they have in view — certainly they have no distinct Chiefs. all those inhabiting between this place and Pitlenny and Muddee on one hand, and Liverpool plains

Major Mc. Lean Esq.
Colonial Secretary

Figure 8 William Ogilvie's April 1827 return for the Merton district, Page 2 of 2 (SRNSW, 4/2045)



on the other assemble occasionally together, and there have been as many as three Hundred Natives at one time – those however who remain chiefly about the upper part of the River, and may be considered as belonging to what is understood by the upper district are I think about one Hundred including all ages, but their wandering and uncivilized habits and the nature of our intercourse with them do not admit of great accuracy in this statement

I have the Honor to be

Sir

Your most Obedient

humble Servant

William Ogilvie

Figure 9 James Glennie's August 1829 return for the Patrick's Plains district, Page 1 of 3 (SRNSW, 4/2045)

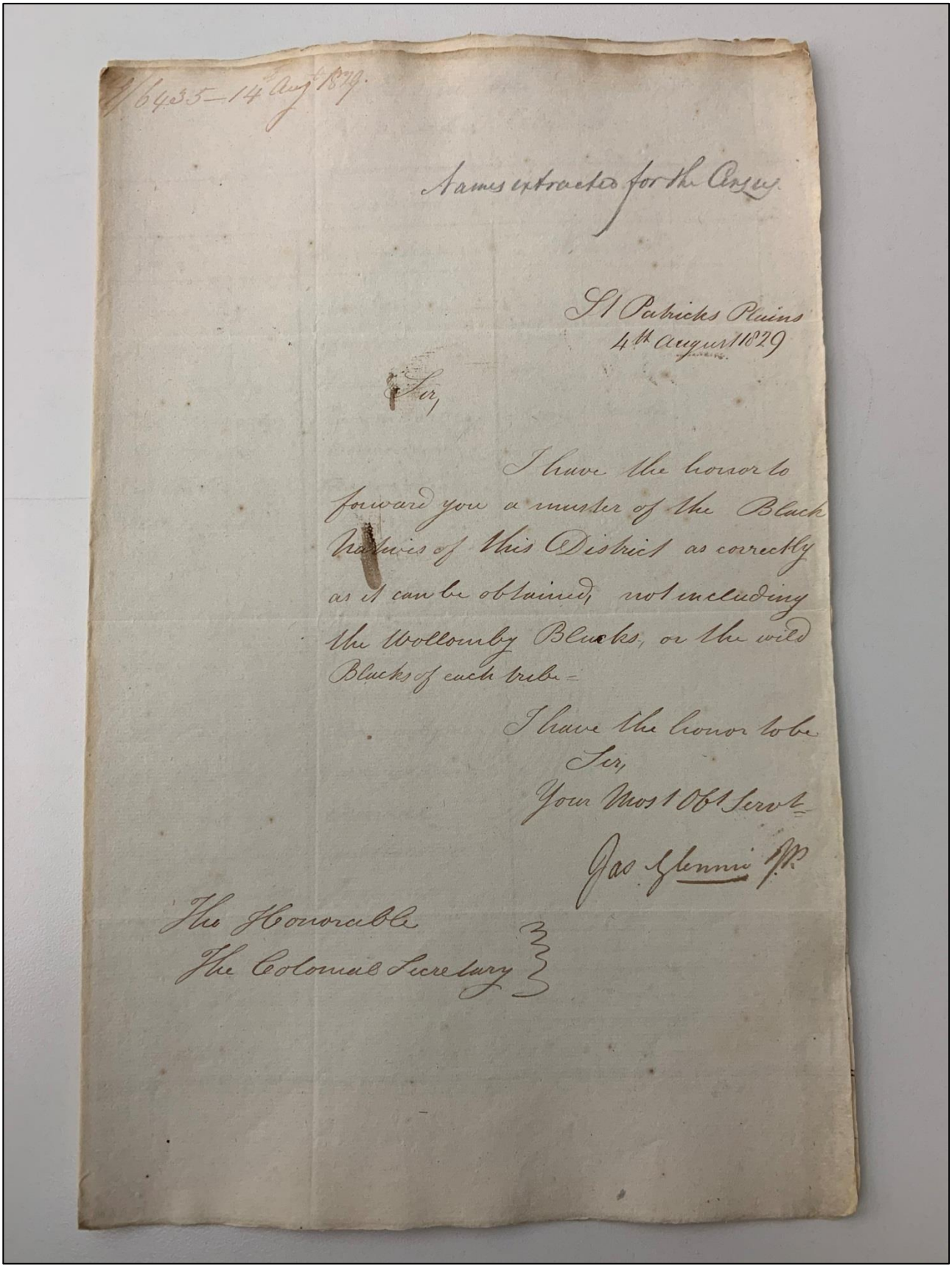
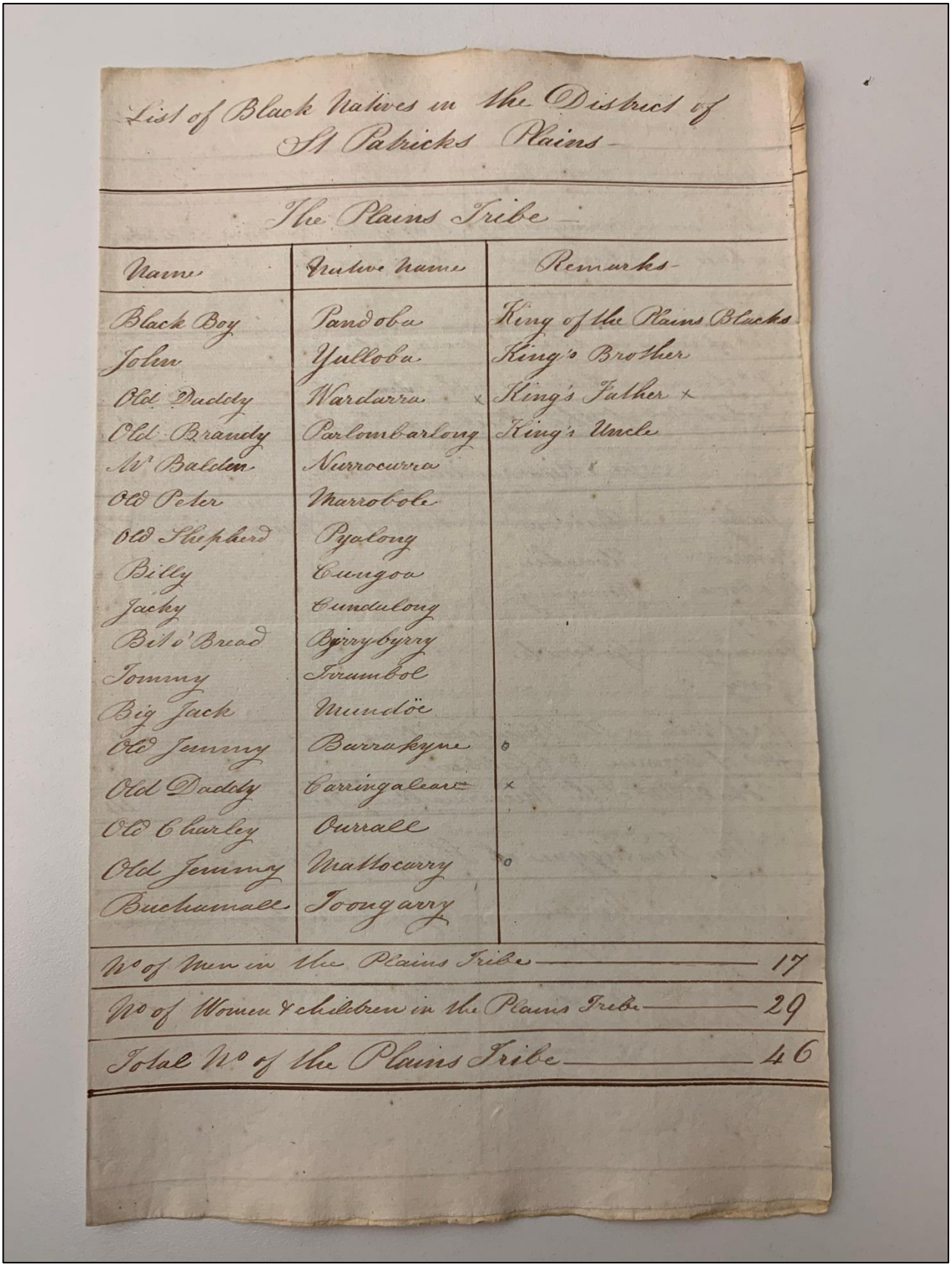


Figure 10 James Glennie's August 1829 return for the Patrick's Plains district, Page 2 of 3 (SRNSW, 4/2045)



List of Black Natives in the District of St Patricks Plains

The Plains Tribe

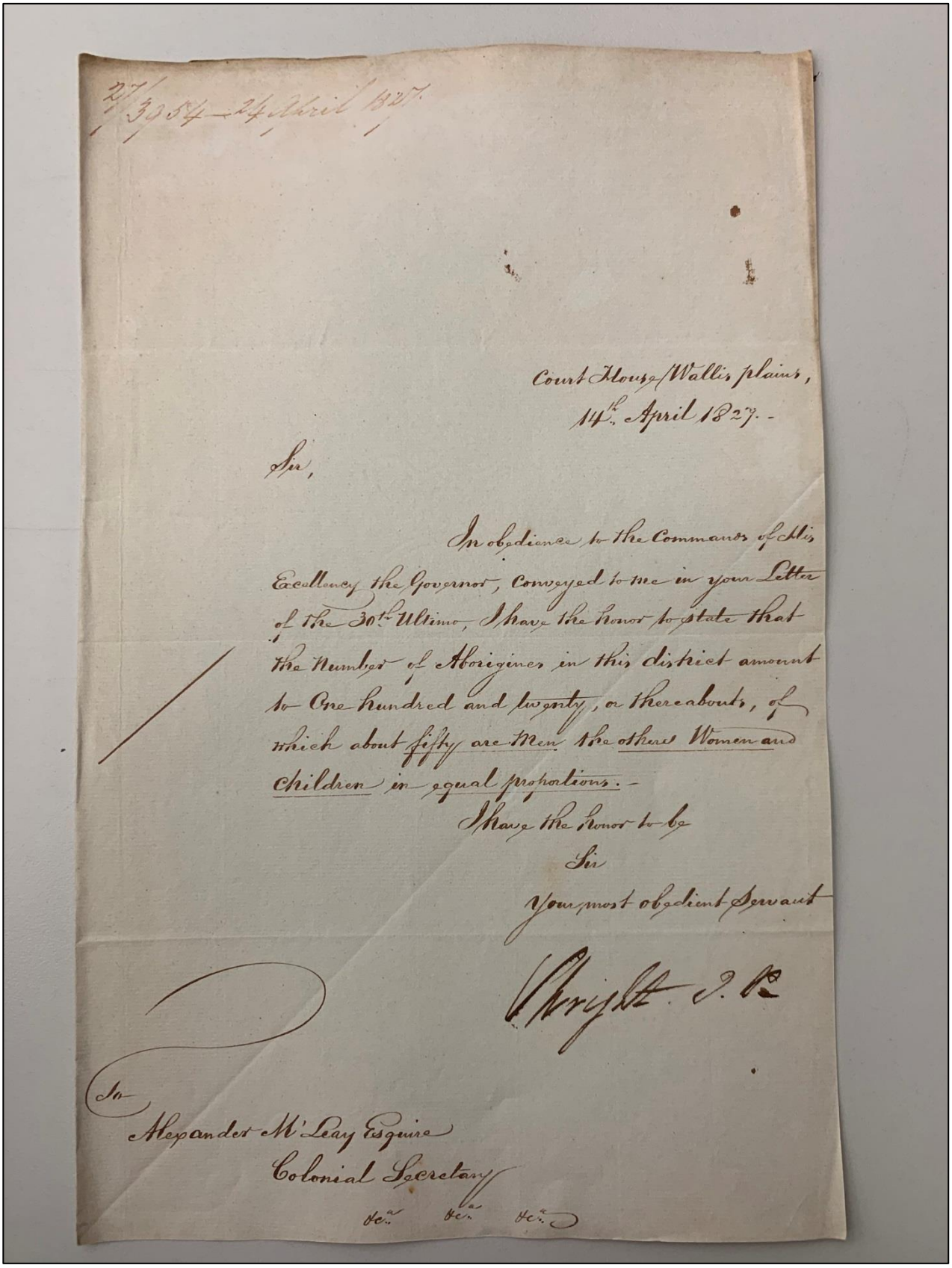
Name	Native Name	Remarks
Black Boy	Pandoba	King of the Plains Blacks
John	Yullooba	King's Brother
Old Daddy	Wardarra x	King's Father x
Old Brandy	Parlombarlong	King's Uncle
Mr Baldeen	Nurrocurra	
Old Peter	Marrobole	
Old Shepherd	Pyalong	
Billy	Cungoa	
Jacky	Cundulong	
Bill o' Bread	Byrry byrry	
Tommy	Turumbol	
Big Jack	Mundöe	
Old Jemmy	Barrakyne o	
Old Daddy	Carringalear x	
Old Charley	Durrale	
Old Jemmy	Mattocurry o	
Buchanale	Toongarry	

No of Men in the Plains Tribe ——— 17

No of Women & children in the Plains Tribe ——— 29

Total No of the Plains Tribe ——— 46

Figure 11 Samuel Wright's April 1827 return for the Wallis Plains district, Page 1 of 1 (SRNSW, 4/2045)



27/3954 – 24 April 1827.

Court House Wallis plains,
14th. April 1827. -

Sir,

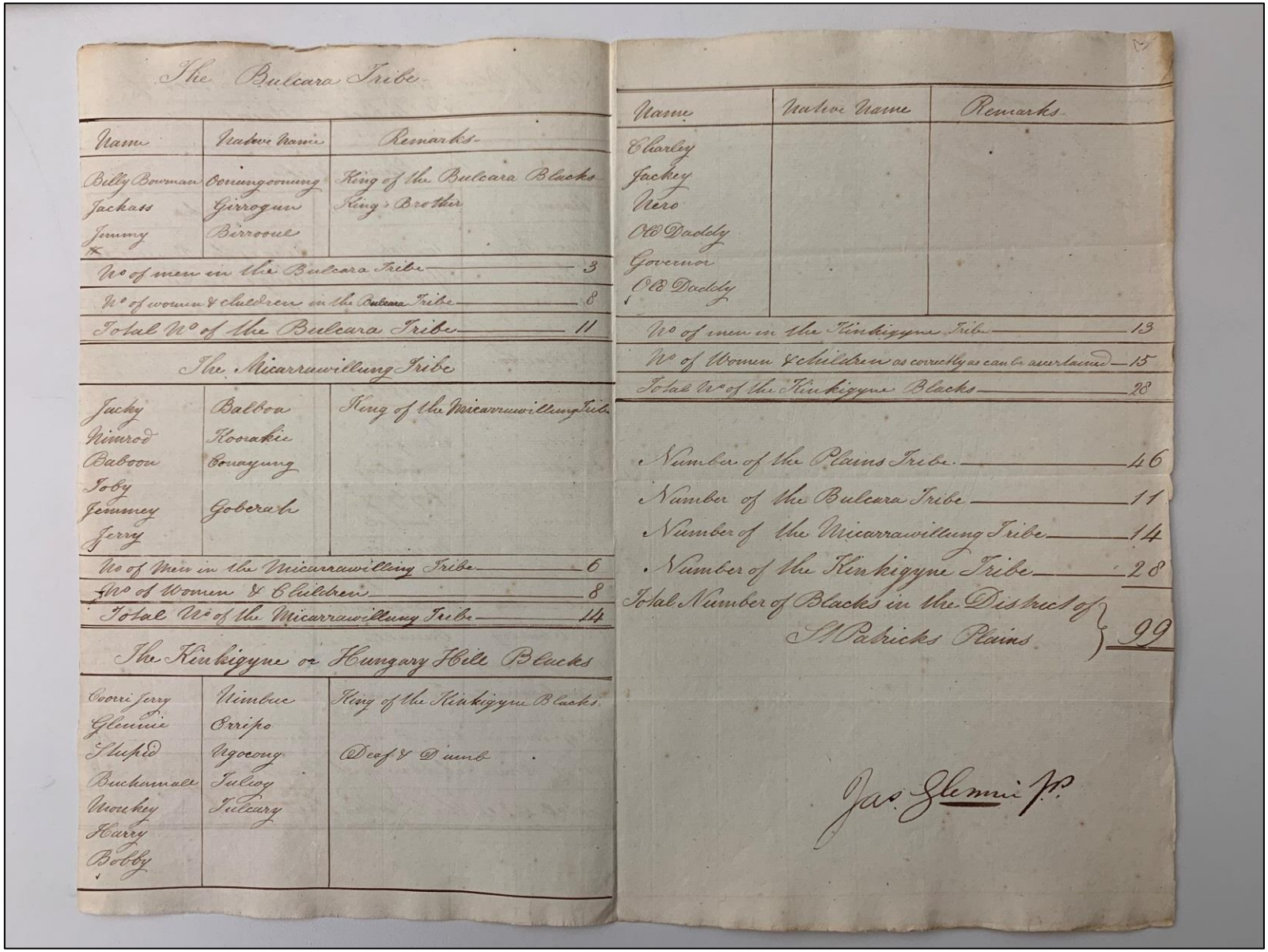
In obedience to the Commands of His Excellency the Governor, Conveyed to me in your Letter of the 30th Ultimo, I have the Honor to state that the Number of Aborigines in this district amount to One Hundred and twenty, or thereabouts, of which about fifty are Men the others Women and Children in equal proportions. -

I have the Honor to be
Sir
Your most obedient Servant

Wright. D. C.

To
Alexander M'Leay Esquire
Colonial Secretary
&c. &c. &c.

Figure 12 James Glennie's August 1829 return for the Patrick's Plains district, Page 3 of 3 (SRNSW, 4/2045



The Bulcara Tribe

Name	Native Name	Remarks
Billy Bowman	Coningoonung	King of the Bulcara Blacks
Jackass	Girrogun	King's Brother
Jemmy	Birroone	

No of men in the Bulcara Tribe — 3
No of women & children in the Bulcara Tribe — 8
Total No of the Bulcara Tribe — 11

The Micarrawillung Tribe

Jacky	Balboa	King of the Micarrawillung Tribe
Nimrod	Kooraki	
Baboon	Conayung	
Joby		
Jemmey	Goberah	
Jerry		

No of Men in the Micarrawillung Tribe — 6
No of Women & Children — 8
Total No of the Micarrawillung Tribe — 14

The Kinkigyne or Hungary Hill Blacks

Coorri Jerry	Nimbue	King of the Kinkigyne Blacks
Glennie	Orrips	
Stupid	Ngocony	Deaf & Dumb
Buckamalee	Tulloy	
Monkey	Tulcary	
Harry		
Bobby		

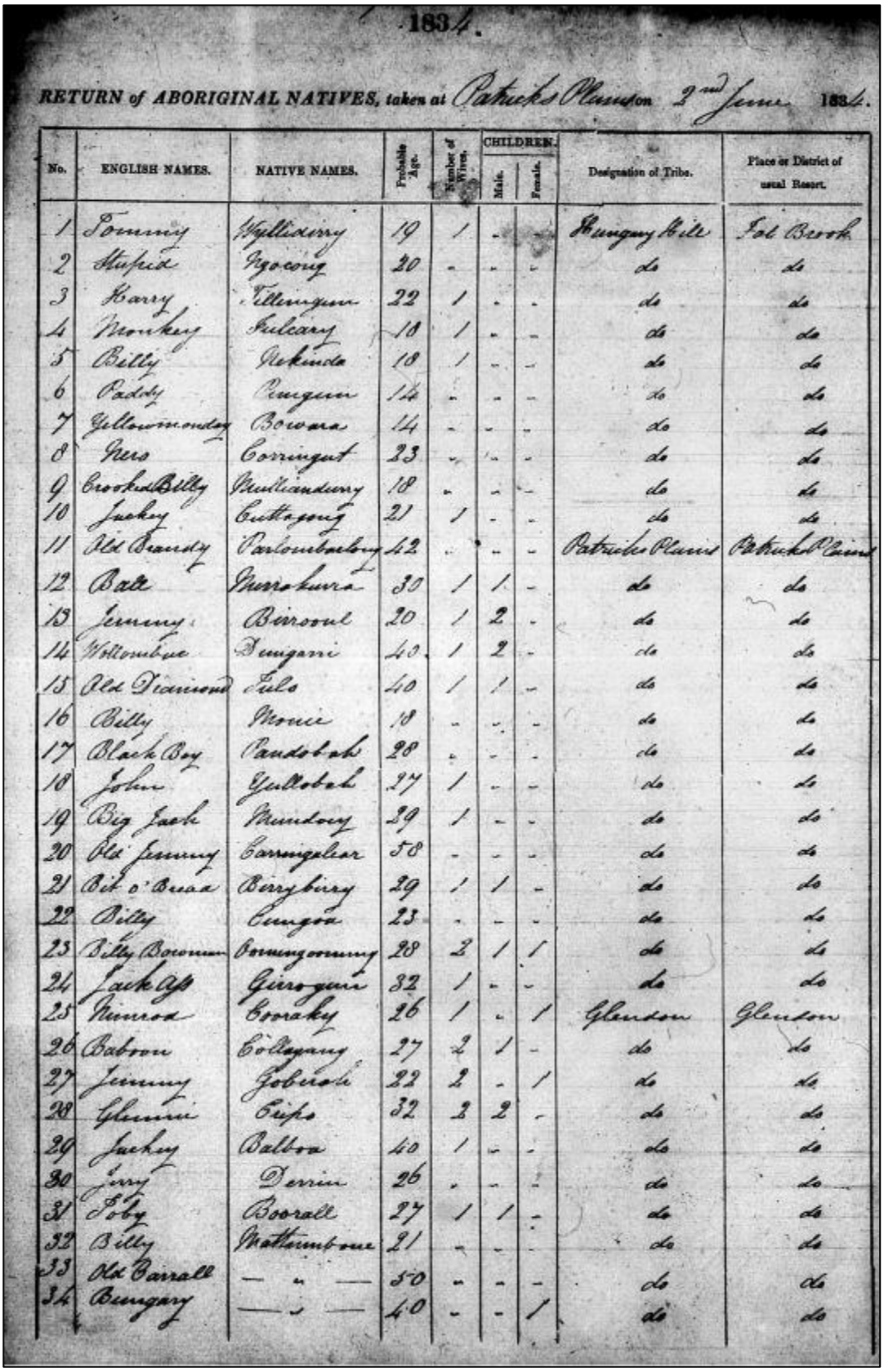
Name	Native Name	Remarks
Charley		
Jackey		
Nero		
Old Daddy		
Governor		
Old Daddy		

No of men in the Kinkigyne Tribe — 13
No of Women & children as correctly as can be ascertained — 15
Total No of the Kinkigyne Blacks — 28

Number of the Plains Tribe — 46
Number of the Bulcara Tribe — 11
Number of the Micarrawillung Tribe — 14
Number of the Kinkigyne Tribe — 28
Total Number of Blacks in the District of S.t Patricks Plains — 99

Jas. Glennie J.P.

Figure 13 Return of Aboriginal Natives, Patrick's Plains, 2 June 1834 1. This return lists the 'place of district of usual resort' for the 'Hungary Hill Tribe' as Fal Brook (SRNSW, Reel 3706)

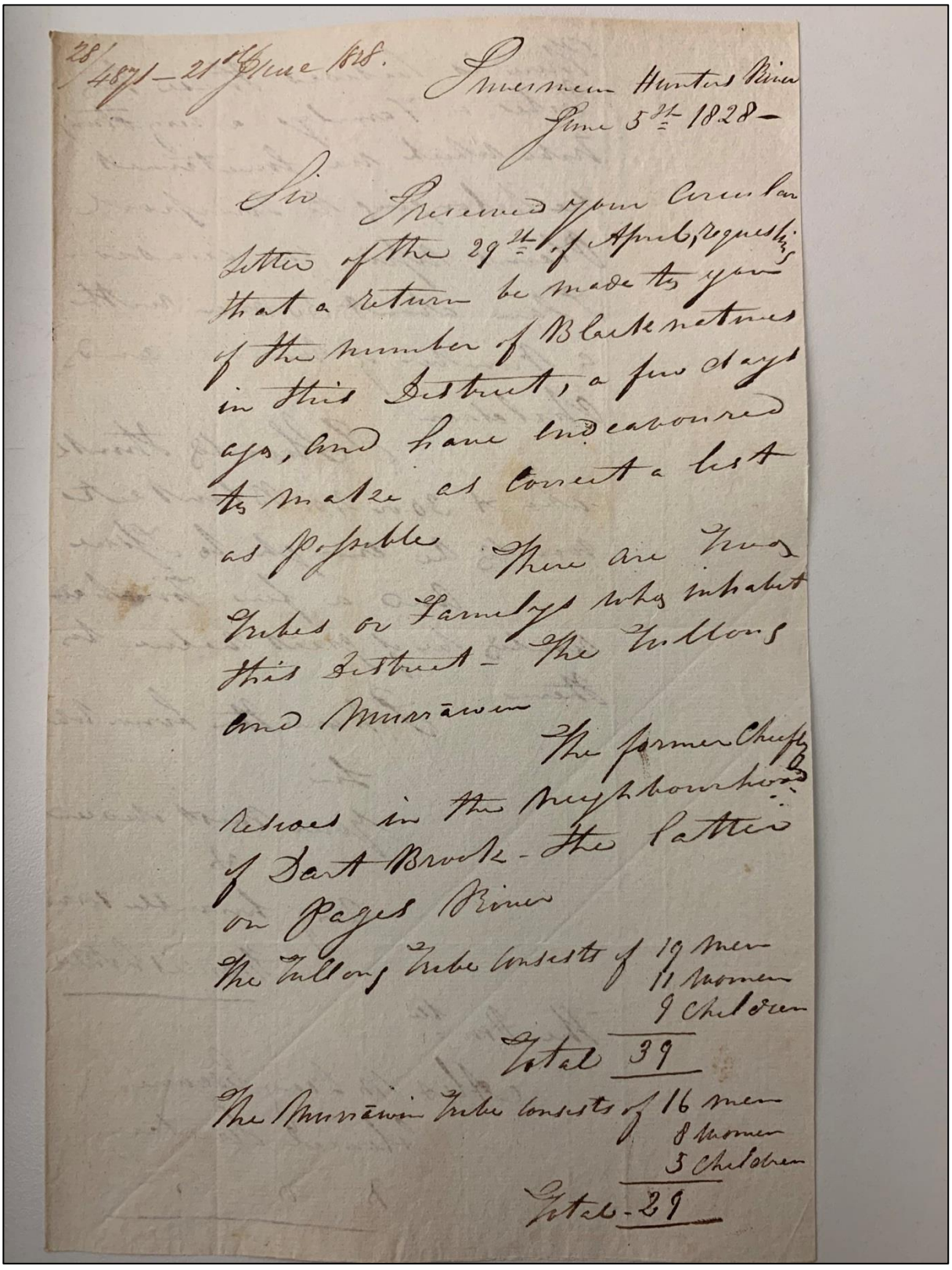


1834.

RETURN of ABORIGINAL NATIVES, taken at Patricks Plains on 2nd June 1834.

No.	ENGLISH NAMES.	NATIVE NAMES.	Probable Age.	Number of Wives.	CHILDREN. Male.	CHILDREN. Female.	Designation of Tribe.	Place or District of usual Resort.
1	Tommy	Wyllidarry	19	1	-	-	Hungary Hill	Fal Brook
2	Stupid	Ngocong	20	-	-	-	do	do
3	Harry	Tillingum	22	1	-	-	do	do
4	Monkey	Pulcary	18	1	-	-	do	do
5	Billy	Rekunda	18	1	-	-	do	do
6	Paddy	Cungum	14	-	-	-	do	do
7	Yellowmondy	Bowara	14	-	-	-	do	do
8	Jerro	Corringut	23	-	-	-	do	do
9	Crooked Billy	Murlandumy	18	-	-	-	do	do
10	Jacky	Cutagong	21	1	-	-	do	do
11	Old Brandy	Parloumbaloy	42	-	-	-	Patricks Plains	Patricks Plains
12	Bale	Murrakura	30	1	1	-	do	do
13	Jemmy	Birroul	20	1	2	-	do	do
14	Willombye	Dungari	40	1	2	-	do	do
15	Old Diamond	Eulo	40	1	1	-	do	do
16	Billy	Mowie	18	-	-	-	do	do
17	Black Boy	Pandobah	28	-	-	-	do	do
18	John	Yullobah	27	1	-	-	do	do
19	Big Jack	Mundowy	29	1	-	-	do	do
20	Old Jemmy	Carringalear	58	-	-	-	do	do
21	Bit o' Beef	Berrybury	29	1	1	-	do	do
22	Billy	Cungoa	23	-	-	-	do	do
23	Billy Boroun	Bonungonnuny	28	2	1	1	do	do
24	Jack Ash	Giroyan	32	1	-	-	do	do
25	Runroa	Booraby	26	1	-	1	Glendon	Glendon
26	Babroon	Collagang	27	2	1	-	do	do
27	Jimmy	Goberah	22	2	-	1	do	do
28	Glennie	Cupo	32	2	2	-	do	do
29	Jacky	Balboa	40	1	-	-	do	do
30	Jerry	Derrin	26	-	-	-	do	do
31	Toby	Boorall	27	1	1	-	do	do
32	Billy	Mattumbone	21	-	-	-	do	do
33	Old Carrall	— " —	50	-	-	-	do	do
34	Bungary	— " —	40	-	-	1	do	do

Figure 14 Francis Little's June 1828 return for the district surrounding his Invermien estate in Dartbrook Page 1 of 2 (SRNSW, 4/2045)


28/4871 – 21st June 1828.

Invermein Hunters River
June 5th 1828 –

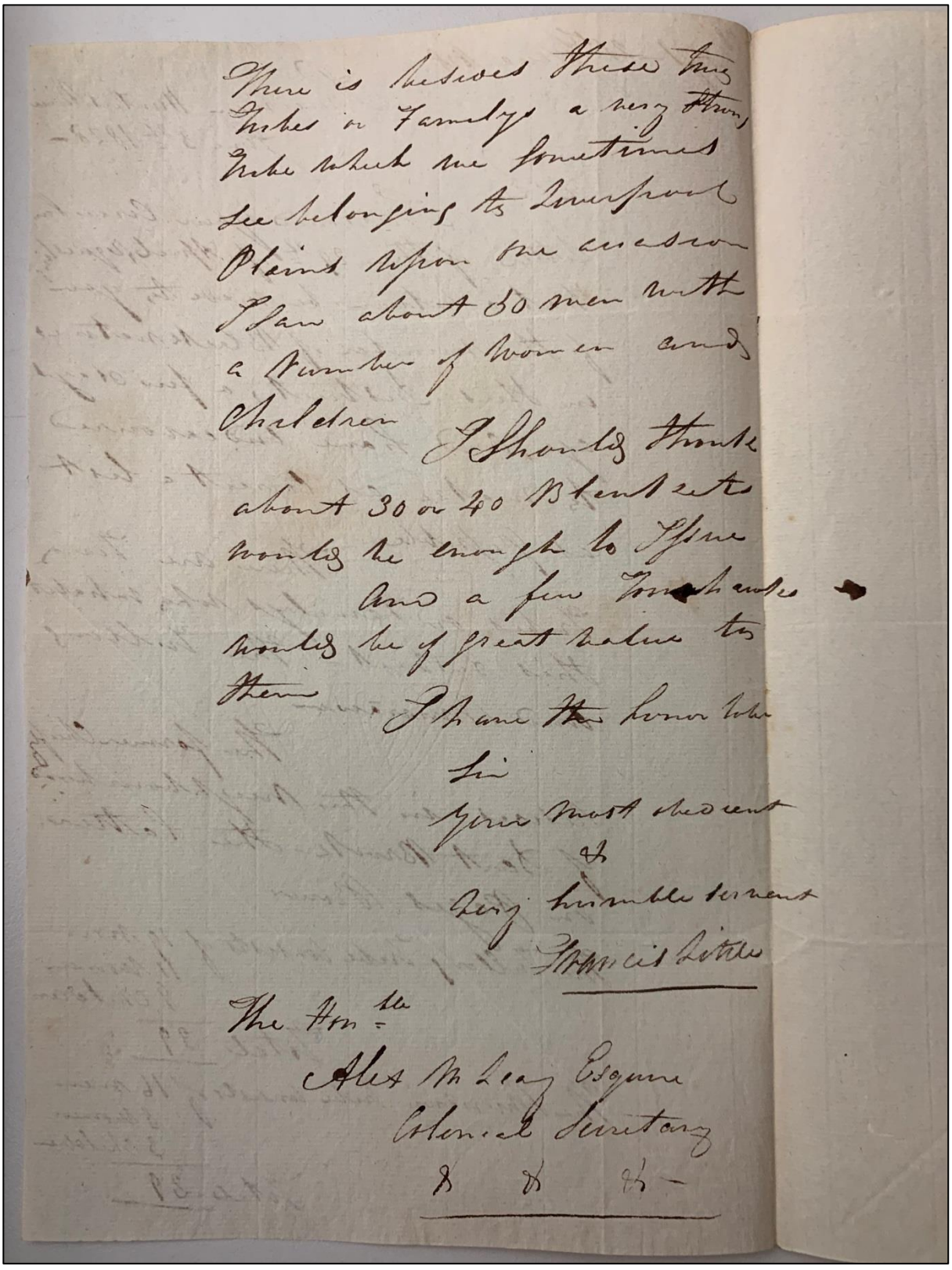
Sir I Received your Circular letter of the 29th of April, Requesting that a return be made to you of the number of Blacks natives in this District, a few days ago, and have endeavoured to make as Correct a list as possible. There are Two Tribes or Families who inhabit this District – The Wallons and Murrawin

The former Chiefly Reside in the Neighbourhood of Dart Brook – the latter on Pages River

The Wallong Tribe Consists of 19 Men
11 Women
9 Children
Total 39

The Murrawin Tribe Consists of 16 Men
8 Women
5 Children
Total 29

Figure 15 Francis Little's June 1828 return for the district surrounding his Invermien estate in Dartbrook Page 2 of 2 (SRNSW, 4/2045)



There is besides these two Tribes or Families a very strong Tribe which we sometimes see belonging to Liverpool Plains upon the occasion I saw about 30 men with a number of Women and Children I should think about 30 or 40 Blankets would be enough to spare and a few Tomahawks would be of great value to them I have the honor to be Sir Your most obedient & very humble Servant Francis Little

The Hon.ble Alex.r McLeay Esqre Colonial Secretary &c &c &c

3.2.1 Mount Arthur Massacre

Specific to the study area, a review of documentary sources for the mid-to-upper Hunter has not identified any reported incidents of Aboriginal-European conflict within or immediately surrounding this area. As indicated above, Gollan (1993) has suggested that the incident known colloquially as the 'Ravensworth massacre' is likely to have occurred within the Mount Arthur area, north-west of the study area. However, other, more recent reviews of this incident (e.g., Dunn, 2015; Umwelt, 2004) cast doubt over this interpretation.

Historically documented incidents of conflict notwithstanding, RAPs involved in the current assessment have identified Mount Arthur, located approximately .5 km north of the study area, as the location of a massacre. While no details of this incident were provided to AECOM as part of the current assessment, it is likely that the incident to which the RAPs are referring is the same incident reported by Aboriginal informants involved in Davidson and Lovell-Jones' (1993) ethnographic investigation for the then proposed Bayswater No. 3 Colliery. Davidson and Lovell-Jones (1993: 20) report several of their informants as having told them of a massacre within 'The Pocket', a prominent re-entrant to the west of Mount Arthur proper (Figure 16). As described in their report:

> *Several people told the same story, with few contradictions (related below), in the course of this study. This story relates to The Pocket or The Little Pocket on the southern side of Mount Arthur. It is believed by these people that a group of approximately 300 local Aboriginal people were either camping in, or were driven into, The Pocket by the Mounted Police (numbers of police unknown). The story goes on to relate that the Aboriginal people, who were thought to be the last survivors in the district, were subsequently all shot to death, men, women and children, by the mounted police from 'on top of the pocket'. No one could then relate what they may have been told had happened to the bodies.*
>
> *All but one of the informants believed the massacre at The Pocket to be accurate, as, all informants trusted that the person who told them was a reliable and honest source (usually a parent or grandparent). They also related their fears of the area and spoke of 'horses always being spooked near The Pocket', they would also 'get this feeling that someone was watching me' and their own 'hair rising on the back of the neck' and of nearby 'windmill spinning tail first' with or without accompanying wind.* (Davidson and Lovell-Jones 1993: 20)

These observations aside, Davidson and Lovell-Jones (1993: 20) noted a lack of corroborating material evidence for the massacre reported by their informants:

> *None the informants who worked around Mount Arthur or played in the rock shelters or 'caves' of Mount Arthur, as children, ever saw any human remains or other material culture remains of Aboriginal people. One informant indicated that in one 'cave', in Mount Arthur, there is a crack along the back where 'if you throw a rock down it you can't hear it land'. The archaeological survey in The Pocket revealed three locations with artefacts, but no other signs of past Aboriginal occupation. Moreover, James and Fife* [i.e., Rosalind James and Ray Fife] *were of the opinion that the slopes and their wooded nature would not have allowed the sort of attack from above being described.*

In addition to 'The Pocket', Davidson and Lovell-Jones (1993: 20) report that two of the archaeologists involved in the archaeological survey component of the Bayswater No.3 Colliery, namely Rosalind James and Ray Fife, were told of "another possible site of the same, or another, massacre" while surveying in the field. This site was located in a gully behind the property of 'Belmont', itself located around 3 km southwest of Mount Arthur, on the northern side of Saddlers Creek (Figure 16). However, "this rumour was not corroborated by any of the other informants" (Davidson and Lovell-Jones, 1993: 20).

In offering their conclusions on the massacre reported by their informants, Davidson and Lovell-Jones (1993: 27) stressed the point that, while their inquiry failed to identify any documentary evidence of a massacre within the Mount Arthur area, the oral histories provided by their informants were to be considered equally authoritative.

Figure 16 Map showing the location of 'The Pocket', adjacent to Mount Arthur proper, as well as Belmont homestead. The gully behind the property Belmont is also marked



3.3 Resilience and Adaption

Perhaps predictably, historical accounts of Aboriginal-European relations within the Hunter Valley have tended to focus on the violence that took place across the valley during the first two decades of European settlement, with other aspects of interaction, such as co-operation, friendship and positive working relationships, largely overlooked. For the Hunter Valley, in particular, the historical emphasis on Aboriginal-settler conflict has obscured what available historical sources indicate a complex pattern of interaction. As Dunn (2015: 236) has stressed, the reaction of the valley's resident Aboriginal population to the invasion of their Country:

> *…was a complex and varied one. Violence and confrontation was one response, with clashes particularly intense during the period between the mid-1820s and mid-1830s as more Europeans moved into the valley. The drama and tragedy of the violence on both sides of the frontier, which for many people was inescapable, has in part obscured the cooperation, friendships and working relationships that also formed throughout the region during the same period. Some relationships transitioned through friendship, violence and co-existence: these highlight the blurred and fluid nature of alliances and affiliations in the colonial Hunter.*

As in other parts of New South Wales and Australia more broadly, the majority of Aboriginal-European interaction across the Hunter Valley in the years following the region's colonisation by Europeans was "driven by the need for and value of Aboriginal labour, which was the most important component of the exchange between the two cultures" (Dunn, 2017: 44). Recent considerations of Aboriginal peoples' involvement in the colonial economy of the Hunter Valley (e.g., Blyton, 2012; Dunn, 2015, 2017) have highlighted the many and varied roles that Aboriginal played in its establishment and operation. Alongside their frequent appointment as guides and trackers, Aboriginal people were regularly employed on the estates and farms of the region for tasks such as shepherding, shearing, harvesting, clearing land, cutting wood, stripping bark, carrying water and tracking lost animals (for a detailed review see (Dunn 2017)).

Specific to the study area and environs, AECOM has been unable to identify any documentary evidence of Aboriginal people having worked on the two major estates of this area: George Bowman's 'Arrowfield' and James Robertson's 'Plashett'. Nonetheless, it is highly considered likely that Aboriginal people were employed to work on one or both of these estates in some capacity at some time. Indeed, as Dunn (2017:55) has observed, "[b]etween the opening of the Hunter Valley to settlement in the early 1820s and the middle of the century, most if not all of the colonial estates and farms in the Hunter Valley employed Aboriginal workers…".

3.4 Mount Arthur Burial

The burial site at Mount Arthur was noted by RAPs as being an important cultural site within the local area. The burial, originally identified by Kuskie (2000), was uncovered as part of salvage works completed by Kuskie & Clarke (2004) for the Mt Arthur Mine. Little has been made publicly available. However, AECOM understands that the burial was left *in-situ* but is located outside the study area and would not be impacted by the Project.

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 1898:180; 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).

3.5 Archaeology in the Study Area

The archaeological investigation completed for the assessment has revealed 275 Aboriginal archaeological sites, comprising 274 open artefact sites (i.e., artefact scatters and isolated artefacts) and one stone quarry. RAPs involved in the assessment have noted that all Aboriginal sites are of significance to contemporary Aboriginal people. A detailed description of the identified sites is provided in the Project's ACHAR.

3.6 Raw Material Sources and Quarries

RAPs participating in the assessment noted that stone raw material sources used for making stone tools were important to Aboriginal people forming part of their subsistence strategies and the broader cultural landscape. As explained in elder Michael Green in *Pathways Across the Hunter* (OEH 2011b):

> *stone materials used by Aboriginal people and the sites where they are found can provide a rare glimpse into the fabric of past Aboriginal society and can increase our knowledge of past Aboriginal land use and ways of life. These sites are an important link for Aboriginal people today linking with their culture and their past. Quarry sites such as these can tell us a lot about Aboriginal stone tools, such as the types of stone used and shown stone was obtained* (OEH 2011b:6)

In particular, gravels available from the Hunter River (the Hunter River Gravels) were identified by RAPs as an important resource. 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 (1998) 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.

In addition to the Hunter River Gravels, two tertiary deposits of stone (i.e., silcrete and tuff) suitable for stone tool production have been previously identified within the study area by Mills (2000). These include AHIMS registered sites 'SC-QS-2' (ID#3-37-2-1954) and 'SC-QS-1' (ID#37-2-1955). Reference to the site card for SC-QS-2 indicates this site covers an area of approximately 500 m² and comprises numerous silcrete, chert, mudstone and quartzite cobbles/boulders scattered across a wide area. The site card notes evidence of use including the presence of a large number of cores and flakes, both primary and secondary. AECOM's inspection of the area likewise identified a large number of silcrete and chert cobbles/boulders dispersed over a large area. However, AECOM found the number of artefacts associated with the cobbles/boulders was relatively small with only a handful identified. It was concluded that while the site meets the broad definition of what constitutes a quarry (i.e., "the location of an exploited stone source" [Hiscock & Mitchell (1993)] evidence of on-source reduction activities were limited. As discussed below, researchers in the Hunter Valley have contended quarrying at a location may take the form of assaying (and cobble rejection) to systematic reduction activities (i.e., flaking and heat shattering of stone) (Jones & White, 1988; White 1998; Moore 2000). In relation to site SC-QS-2, the former (i.e., assaying) is more consistent with evidence observed at the site. The primary activity likely to have taken place onsite is raw material selection with limited knapping, and selected material potentially transported elsewhere for reduction.

Reference to the site card for SC-QS-1 indicates the site covers an area of 150 m x 30 m with cobbles/boulders of mudstone, silcrete, chert, fossilised wood and river pebbles having been identified. Despite several attempts, AECOM was unable to locate the cobbles/boulders described in the site card in the vicinity of the registered site location. Mills' (2000) description of the site contains no information of the number and types of artefacts located at the site. However, photographs of artefacts identified at the site are provided in the report (Mills 2000).

In relation to quarry sites in the Hunter Valley more broadly and 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 the Hunter River Gravels. As discussed above, 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 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.

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.

In context of the Hunter Valley, Aboriginal stone quarry sites are a comparatively rare component of the archaeological record, with only eight instances, for example, 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 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).

3.7 Plant Resources

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 study area would 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 economic terrestrial, aquatic and avian fauna. Historical evidence for the Aboriginal exploitation of faunal and floral resources within the Lower Hunter Valley is discussed in further detail in the ACHAR for this project. A review of economic plant species utilised by Aboriginal published in existing literature (see Cribb & Cribb 1974; Isaacs 2002; Lassak & McCarthy 2001; Stewart & Percival 1997; and Zola & Gott 1992) cross-referenced with the flora surveys undertaken by Hunter Eco (2019) suggest a number of useful plant species utilised by Aboriginal people are located within the study area. Table 4 provides a list of plant species known to have been used by Aboriginal people and their uses that are available within the study area.

Table 4 Economic plant species identified within the Project area

Botanical name	Common name	Potential Use(s)	Reference(s)
Acacia spp.	Acacia	Seeds & gum edible; wood suitable for making range of implements; bark & gum have medicinal properties	Stewart & Percival, 1997
Eucalypt spp.	Eucalypts	Bark has multiple uses (e.g., shelter, shields, baskets, fish nets); wood suitable for making range of implements (e.g., spears, clubs); leaves, gum & bark have medicinal properties	Stewart & Percival, 1997; Isaacs, 2002
Lomandra longifolia	Spiny-headed Matrush	Leaf bases and flowers edible; leaves can be used to make baskets	Stewart & Percival, 1997
Typha orientalis	Cumbungi	Rhizomes edible after roasting; fibres can be used to make string; young shoots can be eaten raw; flower spikes can be steamed and eaten	Stewart & Percival, 1997
Xanthorrhoea johnsonii	Grass Tree	Leaves produce hard waterproof resin that melts when warmed as can be used as binding agent; flowers can be sucked or soaked in water to make sweet drink; leaf bases and growing points edible	Stewart & Percival, 1997
Phragmites australis	Common Reed	Roots edible; Straight flowering stems can be used as spear shafts; leaves can be twisted into rope	Zola & Gott, 1992: 12
Arthropodium minus	Small Vanilla Lily	Tubers edible	Zola & Gott, 1992: 25
Clematis glycinoides	Headache Vine	Roots edible; crushed leaves can be inhaled to relieve headache	Zola & Gott, 1992: 25
Eustrephus latifolius	Wombat Berry	Tuberous roots edible	Cribb & Cribb, 1974: 174

Botanical name	Common name	Potential Use(s)	Reference(s)
Caesia parviflora	Pale Grass-lily	Tubers edible	Zola & Gott, 1992: 44
Angophora floribunda	Rough-barked Apple	Sap has medicinal properties	Lassak & McCarthy, 2001
Pterostylis spp.	Greenhood orchids	Tubers edible	Zola & Gott,1992: 46
Geranium spp.	Native Geranium	Tubers edible	Zola & Gott, 1992: 47
Billardiera scandens	Apple-berry	Fruits edible	Zola & Gott, 1992: 49
Themeda australis	Kangaroo Grass	Seeds edible (ground and baked as cakes); leaves and stems contain fibre that can be used to produce string	Zola & Gott, 1992: 58
Poa sp.	Tussock grass	Fibre from grass can be used to make string nets for nets, baskets and mats.	Zola & Gott, 1992: 58
Panicum effusum	Hairy panic grass	Seeds edible (ground and baked)	Issacs, 2002: 226

4.0 Summary of Findings

Consultation with RAPs for the Project finds that the cultural heritage values of the 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 study area attest to its past use by Aboriginal people and these sites have been identified by RAPs as all highly significant.

More broadly, the 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. While no specific pathways have been identified within the study area, it nonetheless was likely utilised by Aboriginal people travelling to and from Mount Arthur, which is visible from multiple locations within the study area. Likewise, both the Hunter River and Saddlers Creek were likely accessed from places from within the study area by Aboriginal people seeking 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 study area and are considered to hold aesthetic significance.

The three culturally significant landscape features have been identified by RAPs as relevant to the study area, Mount Arthur, the Hunter River and Saddlers Creek, are located outside the study area and would not be directly impacted by the Project. However, views of the mine entry area and portions of the transport and services corridor would be visible from both Mount Arthur and Saddlers Creek. Nonetheless, consideration of the small size of the mine entry area and the transport and services corridor, suggests these visual impacts would be minor. Visual impacts to the Hunter River would be fully avoided with the mine entry area and transport and services corridor not visible from any location on the Hunter River.

5.0 Acknowledgments

Malabar and AECOM would like to acknowledge the Traditional Owners of the study area, the Wonnarua People, and pay respect to their cultural heritage, beliefs and continuing connection to the land. We also would like to pay respect to the Elders past, present and future and to all Aboriginal People who participated in the assessment.

6.0 References

Albrecht, G. 2000. *Rediscovering the Coquun: Towards an Environmental History of the Hunter River*. Unpublished manuscript of address given at the River Forum 2000, Wyndham Estate, Hunter Valley. Available from http://libguides.newcastle.edu.au/chrp/albrecht. Available at: http://libguides.newcastle.edu.au/chrp/albrecht.

Allman, F. 1826. Letter - Allman to De La Condamine, 18 July 1826.

Australian Cultural Heritage Management. 2013. *Mount Owen Continued Operations Volume 1: Aboriginal Cultural Heritage Assessment - Report and Consultation Records*. Unpublished report for Mount Owen Pty Ltd.

Australian Cultural Heritage Management. 2014. *Mount Owen Continued Operations Project: Addendum to the November 2013 Aboriginal Cultural Heritage Assessment Report*. Unpublished report for Mount Owen Pty Ltd.

Australian Government Department of the Environment. 2016. *Engage Early*. Commonwealth of Australia. Available at: http://www.environment.gov.au/system/files/resources/3201a986-88e8-40f3-8c15-6e659ed04006/files/engage-early-indigenous-engagement-guidelines.pdf.

Australian Museum Business Services. 1997. *Archaeological Test Excavations of Aboriginal Sites at Bettys Creek, Mt Owen Mine, Hunter Valley, NSW. Report to Mt Owen Mine, BHP Coal Australia in Four Volumes Volume 4: Appendix G*. Unpublished report for BHP Coal Australia.

Bannister, S. 1826. Letter - Bannister to Darling, 5 September 1826.

Blyton, G. 2012. Aboriginal Guides of the Hunter Region 1800-1850. *History Australia* 9(3): p.89–106.

Bowman, G. 1839. Letter - Bowman to Scott, 5 January 1829.

Bowman, J. et al. 1826. Letter - Lanholders to Darling, 4 September 1826.

Brayshaw, H. 1987. *Aborigines of the Hunter Valley: A Study of Colonial Records.* Scone and Upper Hunter Historical Society.

Buggey, S. 1999. *An approach to Aboriginal cultural landscapes*. Historic Sites and Monuments Board of Canada, Ottawa.

Bundock, E. 1932. Clarence River Historical Society - Mrs. Bundock's Memoir - Early Life in New South Wales - The Coming of the Ogilvies to the Clarence - Hardships of the Journey - Their Arrival at Yulgilbar. *Grafton Daily Examiner*.

Campbell, J.F. 1926. The Genesis of Rural Settlement on the Hunter. *Journal and Proceedings of the Royal Australian Historical Society* 12(2).

Chaves, K.K. 2007. 'A Solemn Judicial Farce, the Mere Mockery of a Trial': the Acquittal of Lieutenant Lowe, 1827. *Aboriginal History* 31: p.122–140.

Cribb, A.B., & Cribb, J.W. 1974. *Wild Food in Australia*. Sydney: Collins.

Cunningham, P. 1827. *Two Years in New South Wales Comprising Sketches of the Actual State of Society in that Colony, Vols. 1 and 2*. London: Henry Colburn.

Darling, R. 1826a. Letter - Darling to Bathurst, 6 October 1826.

Darling, R. 1826b. Letter - Darling to Hay, 11 September 1826.

Darling, R. 1826c. Letter - Darling to the Landholders at Hunter's River, 5 September 1826.

Davidson, I., & Lovell-Jones, C. 1993. *Ethnographic Investigations Proposed Bayswater No 3 Colliery Authorisation Area (A437)*. Unpublished report for Resource Planning Pty Ltd.

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

Department of Environment, C.C. and W.N. 2010. *FACT SHEET 2 What is an Aboriginal cultural landscape?* Department of Environment, Climate Changeand Water NSW.

Dunn, M. 2015. *A Valley in a Valley: Colonial Struggles over Land and Resources in the Hunter Valley, NSW 1820-1850*. University of New South Wales.

Dunn, M. 2017. In the 'Contact Zone': Aboriginal Workers in Colonial Newcastle and its Hinterland. *Journal of Australian Colonial History* 19: p.43–56.

Dyall, L. 1977. *Environmental Studies - Mt Arthur Project (Hunter Valley): Full Report on Aboriginal Relics*. Report to Electricity Commission of NSW.

Esteves, V. 1999. *Unravel and Gravel: A Study of Hunter River Mudstone and Silcrete Gravels, An Archaeological Perspective*. University of New England.

Fawcett, J.. 1898. Notes on the Customs and dialect of the Wonnah-Ruah Tribe. *Science of Man* 1(7): p.152–154.

Geary, P.M., & Erskine, W.D. 1984. Sediment Transport and Channel Changes in the Hunter River Since European settlement. In R. J. Loughran (ed) *Drainage Basin Erosion and Sedimentation*, 51–58. Newcastle: University of Newcastle and Soil Conservation Service of NSW

Gollan, V. 1993. *The Military Supression of Wanaruah Resistance in the Upper Hunter 1826: Mount Arthur and Surrounding Area*. Unpublished report to the Wanaruah LALC.

Greig, J. 1826a. Letter - James Greig to his Brother, 11 November 1826.

Greig, J. 1826b. Letter - James Greig to Mr Andrew Kettie, 11 November 1826.

Gunson, N. 1974. *Australian Reminiscenes and Papers of L.E.Threlkeld: Missionary to the Aborigines 1824-1859, Vols. 1 and 2*. Canberra: Australian Institute of Aboriginal Studies.

Hiscock, P., & Mitchell, S. 1993. *Stone Artefact Quarries and Reduction Sites in Australia: Towards a Type Profile*. Canberra: Australian Government Publishing Service.

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

Hunter Eco. 2019. *Maxwell Project Baseline Flora Report*. Unpublished report for Malabar Coal Limited.

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

Isaacs, J. 2002. *Bush Food: Aboriginal Food and Herbal Medicine*. Marleston: JB Books.

Jones, R., & White, N. 1988. Point Blank: Stone Tool Manufacture at the Ngilipitji Quarry, Arnhem Land 1981. In B. Meehan & R. Jones (eds) *Archaeology with Ethnography: An Australian Perspective*, 51–87. Canberra: Department of Prehistory, Research School of Pacific Studies, Australian National University

Kuskie, P.J. 2000. *An Aboriginal Assessment of the Proposed Mount Arthur North Coal Mine, Near Muswellbrook, Hunter Valley, New South Wales*. Report to Dames and Moore.

Kuskie, P.J., & Clarke, E.A. 2004. *Salvage of Aboriginal Heritage Sites in the Mount Arthur North Coal Mine Lease. Volumes A-C.* Unpublished report for BHP Billiton-Hunter Valley Energy Coal.

Lassak, E., & McCarthy, T. 2001. *Australian Medicinal Plants*. Sydney: New Holland.

MacDonald, K., & Davidson, I. 1998. *Bayswater Archaeological Research Project: Volumes 1-2.* Armidale: School of Human and Environmental Studies, University of New England.

McKiernan, B. 1911. Some Notes on the Aborigines of the Lower Hunter River. *Anthropos* 6: p.885–892.

Miller, J. 1985. *Koori: A Will To Win - The Heroic Resistance, Survival & Triumph of Black Australia*. Sydney: Angus and Robertson Publishers.

Miller, R. 1887. The Hunter River: The Wonnarua Tribe and Language. *Australian Race* 3: p.353–355.

Mills, R. 2000. *An Archaeological Survey for a Feasibility Study for Saddlers Creek Mine, near Muswellbrook*. Unpublished report for Shell Coal.

Moore, M. 2000. Technology of Hunter Valley Microlith Assemblages, New South Wales. *Australian Archaeology* 51: p.28–39.

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

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

NSW Office of Environment & Heritage. 2011b. *Pathways Across the Hunter: A Cultural Journey*. Sydney: Office of Environment and Heritage.

Ogilvie, W. 1827. Letter - Ogilvie to Colonial Secretary McLeay, 22 April 1827.

Scott, H. 1826. Letter - Helenus Scott to Augusta Scott, 25 September 1826.

Scott, R. 1826. Deposition of Robert Scott.

Scott, R., & McLeod, A. 1826. Letter - Scott and McLeod to Colonial Secretary McLeay, 3 October 1826.

Scott, W. 1929. *The Port Stephens Blacks: Recollections of William Scott*. Dungog: The Chronical Office.

Stewart, K., & Percival, B. 1997. *Bush Foods of New South Wales: A Botanic Record and an Aboriginal Oral History*. Sydney: Royal Botanic Gardens Sydney.

The Australian. 1825. The Australian, 10 November 1825. *The Australian*.

The Australian. 1826a. The Australian, 23 September 1826. *The Australian*.

The Australian. 1826b. The Australian, 9 September 1826. *The Australian*.

The Australian. 1826c. The Australian, 24 June 1826. *The Australian*.

The Sydney Gazette and New South Wales Advertiser. 1826. The Sydney Gazette, 9 September 1826. *The Sydney Gazette and New South Wales Advertiser*.

Threlkeld, L.E. 1826. Letter - Threlkeld to Bannister, 21 August 1826.

Umwelt (Australia) Pty Ltd. 2004. *Reponse to Department of Environment and Conservation Request for Further Information in Relation to the Aboriginal Archaeological Assessment - Glendall Open Cut Mine*. Unpublished report for NSW Department of Environment and Conservation.

Umwelt (Australia) Pty Ltd. 2006. *Archaeological Assessment for Downcast Ventilation Shaft and Associated Infrastructure, Proposed Exploration Adit*. Prepared for Mt Arthur Coal Pty Ltd.

White, E. 1998. *Archaeological Salvage of Site B10 & B33 Bengalla Mine, Hunter Valley, NSW.* Unpublished report for Bengalla Mining Company.

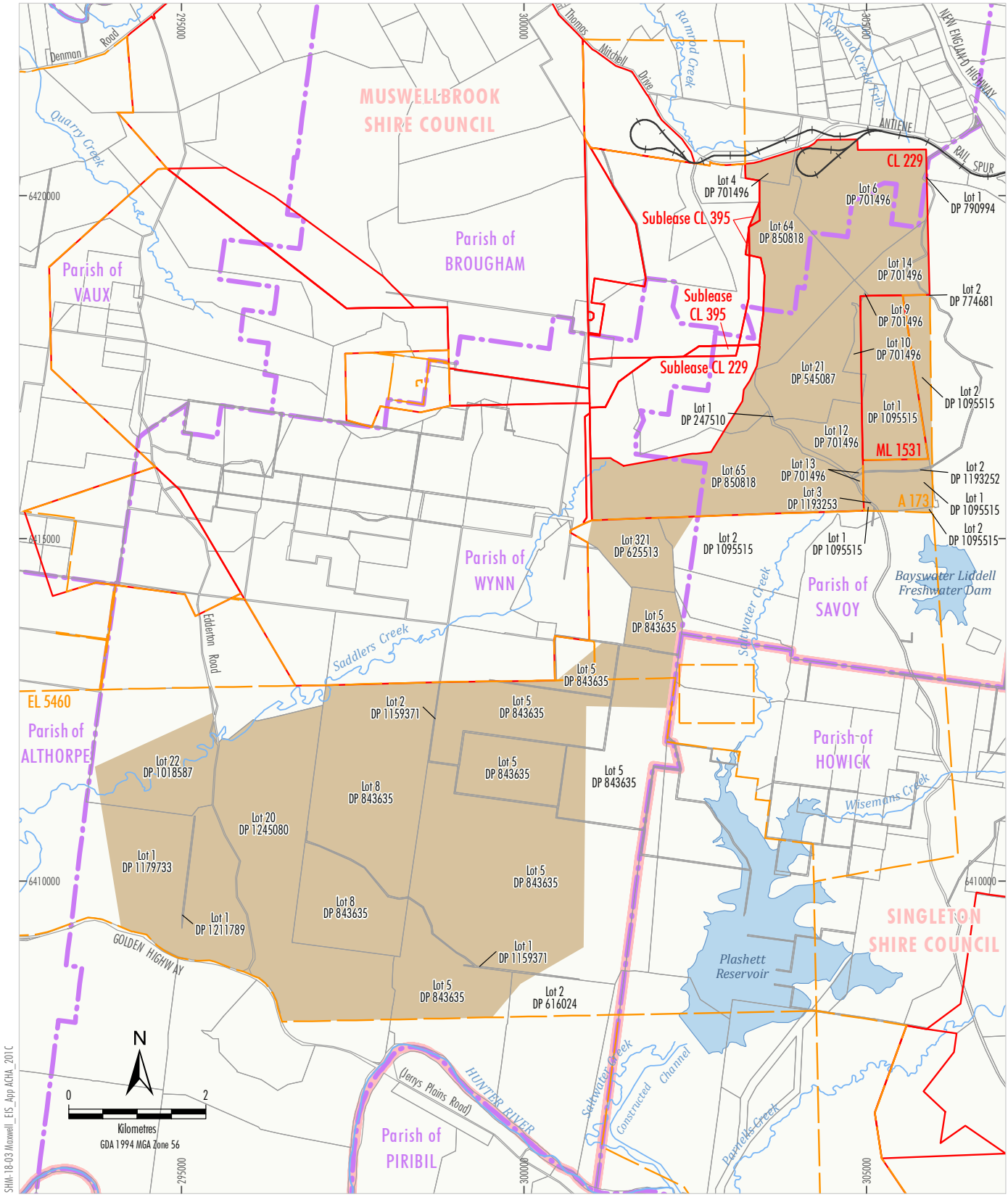
Wood, W.A. 1972. *Dawn in the Valley: The Story of Settlement in the Hunter River Valley to 1833*. Sydney: Wentworth Books.

Woodbury, J. 1826. Deposition of John Woodbury, 29 August 1826.

Zola, N., & Gott, B. 1992. *Koorie Plants, Koorie People: Traditional Aboriginal Food, Fibre and Healing Plants of Victoria*. Melbourne: Koorie Heritage Trust.

Appendix B

Cadastral Information



SHM-18-03 Maxwell_EIS_App ACHA_201C

LEGEND

- Railway
- Local Government Boundary
- Parish Boundary
- Cadastral Boundary
- Exploration Licence Boundary
- Mining and Coal Lease Boundary
- Indicative Project Area

Source: © NSW Department of Planning and Environment (2019); NSW Department of Finance, Services & Innovation (2019)

MALABAR COAL

MAXWELL PROJECT

Indicative Project Area
Lot and DP Details

Figure B-1

Appendix C

Project Sears

	water, alluvial and Permian aquifers and how that could be impacted by the development; - accurate predictions of water take from each water source based on a calibrated transient 3D groundwater flow model that includes both a sensitivity and uncertainty analysis, has been independently peer reviewed and has regard to the Hunter Bioregional Assessment; - an assessment of the likely impacts of the development on watercourses, riparian land, water-related infrastructure, and other water users (private bores and groundwater dependent ecosystems); - an assessment of the likely impacts of the development on a water resource in relation to coal seam gas development and large coal mining development under the *Environment Protection and Biodiversity Conservation Act 1999* (see Attachment 4); - a detailed site water balance, including a description of site water demands, water disposal methods (inclusive of volume and frequency of any water discharges), water supply infrastructure and water storage structures; - identification of any licensing requirements or other approvals under the *Water Act 1912* and/or *Water Management Act 2000* (including both general and high security licences); - demonstration that water take for the construction and operation of the proposed development can be obtained from an appropriately authorised and reliable supply in accordance with the operating rules of any relevant Water Sharing Plan (WSP) or water source embargo; - an assessment of any likely flooding impacts of the development; - a salinity investigation study; and - the measures which would be put in place to control sediment run-off and avoid erosion; • **Biodiversity** – including**:** - accurate predictions of any vegetation to be cleared on site; - an assessment of the likely biodiversity impacts of the development, paying particular attention to threatened species, populations and ecological communities, undertaken in accordance with *Biodiversity Assessment Method* and documented in a Biodiversity Development Assessment Report (BDAR) or, subject to agreement with OEH and the Department, undertaken in accordance with the Upper Hunter Strategic Assessment (UHSA); - assessment of the likely impacts of the development on listed threatened species and communities under the *Environment Protection and Biodiversity Conservation Act 1999* (see Attachment 4); - a strategy to offset any residual impacts of the development in accordance with the offset rules under the *Biodiversity Offsets Scheme*; and - consideration of potential resource sterilisation in relation to any proposed biodiversity offset areas; • **Heritage** – including: - an assessment of the potential impacts of the development on Aboriginal heritage (cultural and archaeological), including consultation with relevant Aboriginal communities/parties and documentation of the views of these stakeholders regarding the likely impact of the development on their cultural heritage; and - an assessment of the potential impacts of the development on historic heritage items and cultural landscapes, including preparation of a Heritage Impact Statement and/or Historical Archaeological Assessment, prepared by a suitably qualified heritage expert; • **Traffic & Transport** – including: - an assessment of the likely transport impacts of the development on the capacity, condition, safety and efficiency of the road and rail networks, including undertaking a road safety audit; and - a traffic analysis of any major/relevant intersections impacted, using SIDRA or a similar traffic model; • **Hazards** – including:

OEH Submission

Aboriginal cultural heritage
5. The Environmental Impact Assessment (EIS) must identify and describe the Aboriginal cultural heritage values that exist across the whole area that will be affected by the development and document these in the Aboriginal Cultural Heritage Assessment Report (ACHAR). This may include the need for surface survey and test excavation. The identification of cultural heritage values should be guided by the Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW (DECCW, 2011) and consultation with OEH regional branch officers.
6. Consultation with Aboriginal people must be undertaken and documented in accordance with the Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW). The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the ACHAR.
7. Impacts on Aboriginal cultural heritage values are to be assessed and documented in the ACHAR. The ACHAR must demonstrate attempts to avoid impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the ACHAR must outline measures proposed to mitigate impacts. Any objects recorded as part of the assessment must be documented and notified to OEH.

Appendix D

Agency Letters

AECOM Imagine it. Delivered.

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

28 May 2018

Archaeologist
Aboriginal Heritage Section
Office of Environment and Heritage NSW
Locked Bag 1002
Dangar NSW 2309

Dear Sir/Madam,

Request for Relevant Aboriginal Stakeholder Information for the Maxwell Project located in Muswellbrook and Singleton LGAs, NSW

I am writing to inform you that AECOM Australia Pty Ltd (AECOM) has been commissioned by Malabar Coal Limited to undertake an Aboriginal cultural heritage assessment for the Maxwell Project located to the east of Denman and south of Muswellbrook, within the local government areas of Muswellbrook and Singleton (the 'Area of Interest', Figure 1).

The Maxwell Project would extract coal through underground mining within the Wittingham Coal Measures for a mine life of approximately 26 years. The Maxwell Project would include the development of a mine infrastructure area adjacent to the mine entry. Coal when mined would be transferred to existing coal preparation and train loading infrastructure for processing and dispatch to markets. The Proponent for the Project is Maxwell Ventures (Management) Pty Ltd, a wholly owned subsidiary of Malabar Coal Limited (Level 26, 259 George Street, Sydney NSW 2000).

The purpose of this letter is to request from you, in accordance with cl 80C(2)(a) of the *National Parks and Wildlife Regulation 2009* and Section 4.1.2 of the Office of Environment and Heritage's (OEH) *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010), the name and contact details of Aboriginal individuals and/or organisations whom you consider may hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects/places in the Area of Interest, and who may be interested in being consulted. Could you please provide these details by 14 June 2018.

Should you have information regarding the above or have any questions, please don't hesitate to contact:

Geordie Oakes
c/- AECOM Australia Pty Ltd
PO Box Q410, QVB Post Office,
Sydney, NSW 1230
Ph: +61 2 8934 0610
Fax: +61 2 8934 0001
Email: Geordie.Oakes@aecom.com

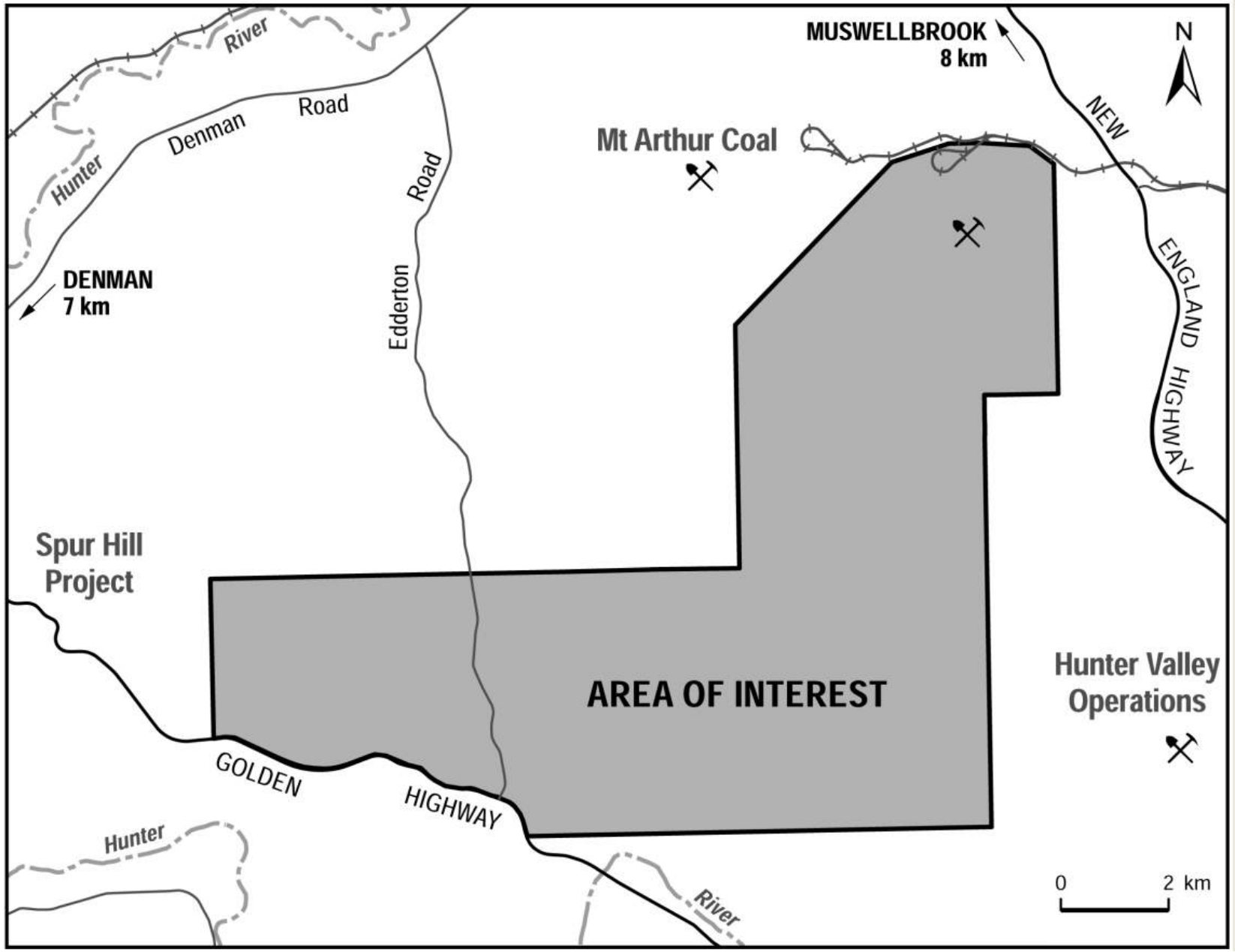
Kind regards,



Geordie Oakes
Archaeologist
Geordie.Oakes@aecom.com

Direct Dial: +61 2 8934 0610
Direct Fax: +61 2 8934 0001

Figure 1 Area of Interest



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

28 May 2018

The Register
Office of the Registrar, Aboriginal Land Rights Act 1983
PO Box 112
Glebe NSW 2037

Dear Sir/Madam,

Request for Relevant Aboriginal Stakeholder Information for the Maxwell Project located in Muswellbrook and Singleton LGAs, NSW

I am writing to inform you that AECOM Australia Pty Ltd (AECOM) has been commissioned by Malabar Coal Limited to undertake an Aboriginal cultural heritage assessment for the Maxwell Project located to the east of Denman and south of Muswellbrook, within the local government areas of Muswellbrook and Singleton (the 'Area of Interest', Figure 1).

The Maxwell Project would extract coal through underground mining within the Wittingham Coal Measures for a mine life of approximately 26 years. The Maxwell Project would include the development of a mine infrastructure area adjacent to the mine entry. Coal when mined would be transferred to existing coal preparation and train loading infrastructure for processing and dispatch to markets. The Proponent for the Project is Maxwell Ventures (Management) Pty Ltd, a wholly owned subsidiary of Malabar Coal Limited (Level 26, 259 George Street, Sydney NSW 2000).

The purpose of this letter is to request from you, in accordance with cl 80C(2)(a) of the *National Parks and Wildlife Regulation 2009* and Section 4.1.2 of the Office of Environment and Heritage's (OEH) *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010), the name and contact details of Aboriginal individuals and/or organisations whom you consider may hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects/places in the Area of Interest, and who may be interested in being consulted. Could you please provide these details by 14 June 2018.

Should you have information regarding the above or have any questions, please don't hesitate to contact:

Geordie Oakes
c/- AECOM Australia Pty Ltd
PO Box Q410, QVB Post Office,
Sydney, NSW 1230
Ph: +61 2 8934 0610
Fax: +61 2 8934 0001
Email: Geordie.Oakes@aecom.com

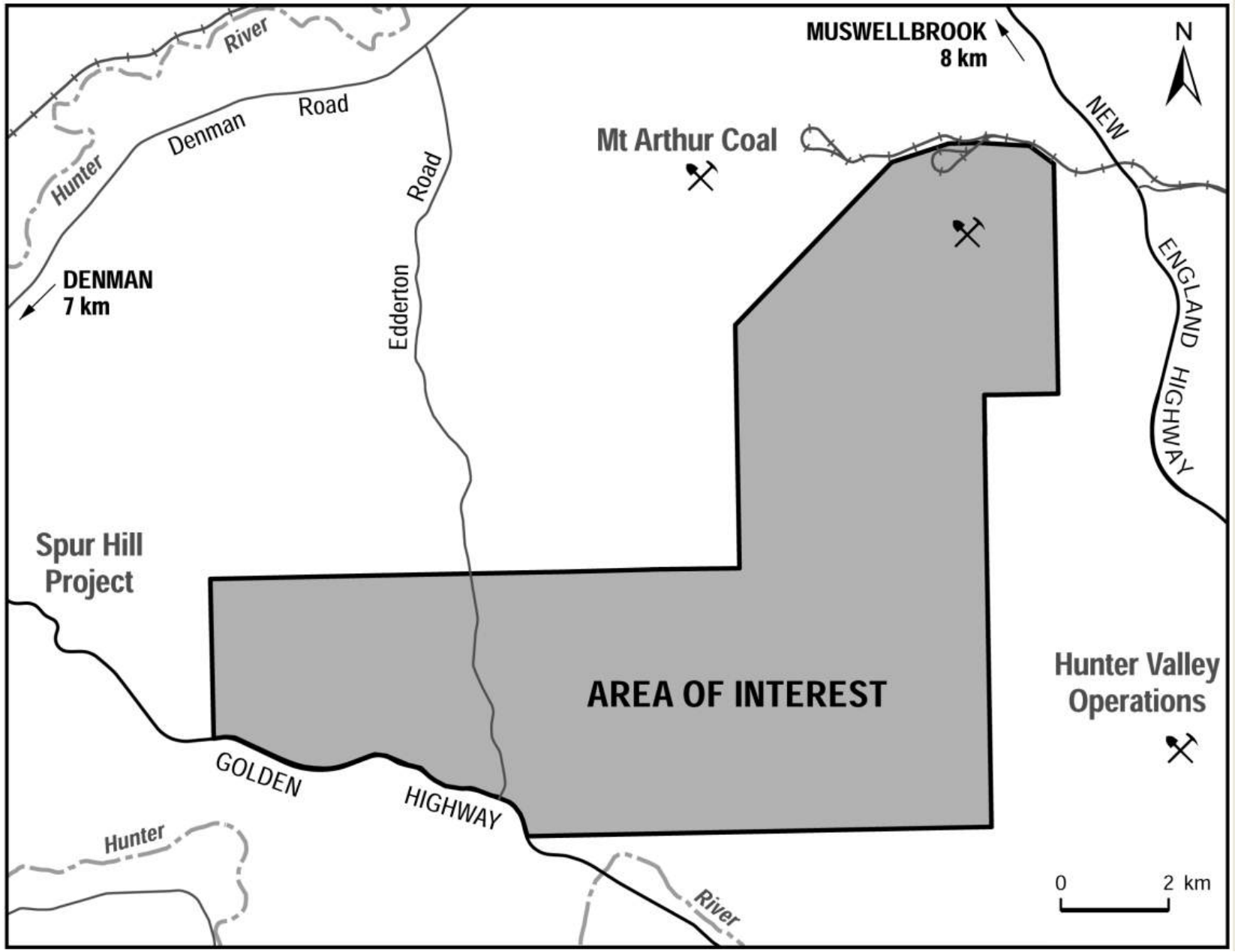
Kind regards,



Geordie Oakes
Archaeologist
Geordie.Oakes@aecom.com

Direct Dial: +61 2 8934 0610
Direct Fax: +61 2 8934 0001

Figure 2 Area of Interest



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

28 May 2018

Hunter Local Land Services Office
98 John Street
Singleton NSW 2330

Dear Sir/Madam,

Request for Relevant Aboriginal Stakeholder Information for the Maxwell Project located in Muswellbrook and Singleton LGAs, NSW

I am writing to inform you that AECOM Australia Pty Ltd (AECOM) has been commissioned by Malabar Coal Limited to undertake an Aboriginal cultural heritage assessment for the Maxwell Project located to the east of Denman and south of Muswellbrook, within the local government areas of Muswellbrook and Singleton (the 'Area of Interest', Figure 1).

The Maxwell Project would extract coal through underground mining within the Wittingham Coal Measures for a mine life of approximately 26 years. The Maxwell Project would include the development of a mine infrastructure area adjacent to the mine entry. Coal when mined would be transferred to existing coal preparation and train loading infrastructure for processing and dispatch to markets. The Proponent for the Project is Maxwell Ventures (Management) Pty Ltd, a wholly owned subsidiary of Malabar Coal Limited (Level 26, 259 George Street, Sydney NSW 2000).

The purpose of this letter is to request from you, in accordance with cl 80C(2)(a) of the *National Parks and Wildlife Regulation 2009* and Section 4.1.2 of the Office of Environment and Heritage's (OEH) *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010), the name and contact details of Aboriginal individuals and/or organisations whom you consider may hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects/places in the Area of Interest, and who may be interested in being consulted. Could you please provide these details by 14 June 2018.

Should you have information regarding the above or have any questions, please don't hesitate to contact:

Geordie Oakes
c/- AECOM Australia Pty Ltd
PO Box Q410, QVB Post Office,
Sydney, NSW 1230
Ph: +61 2 8934 0610
Fax: +61 2 8934 0001
Email: Geordie.Oakes@aecom.com

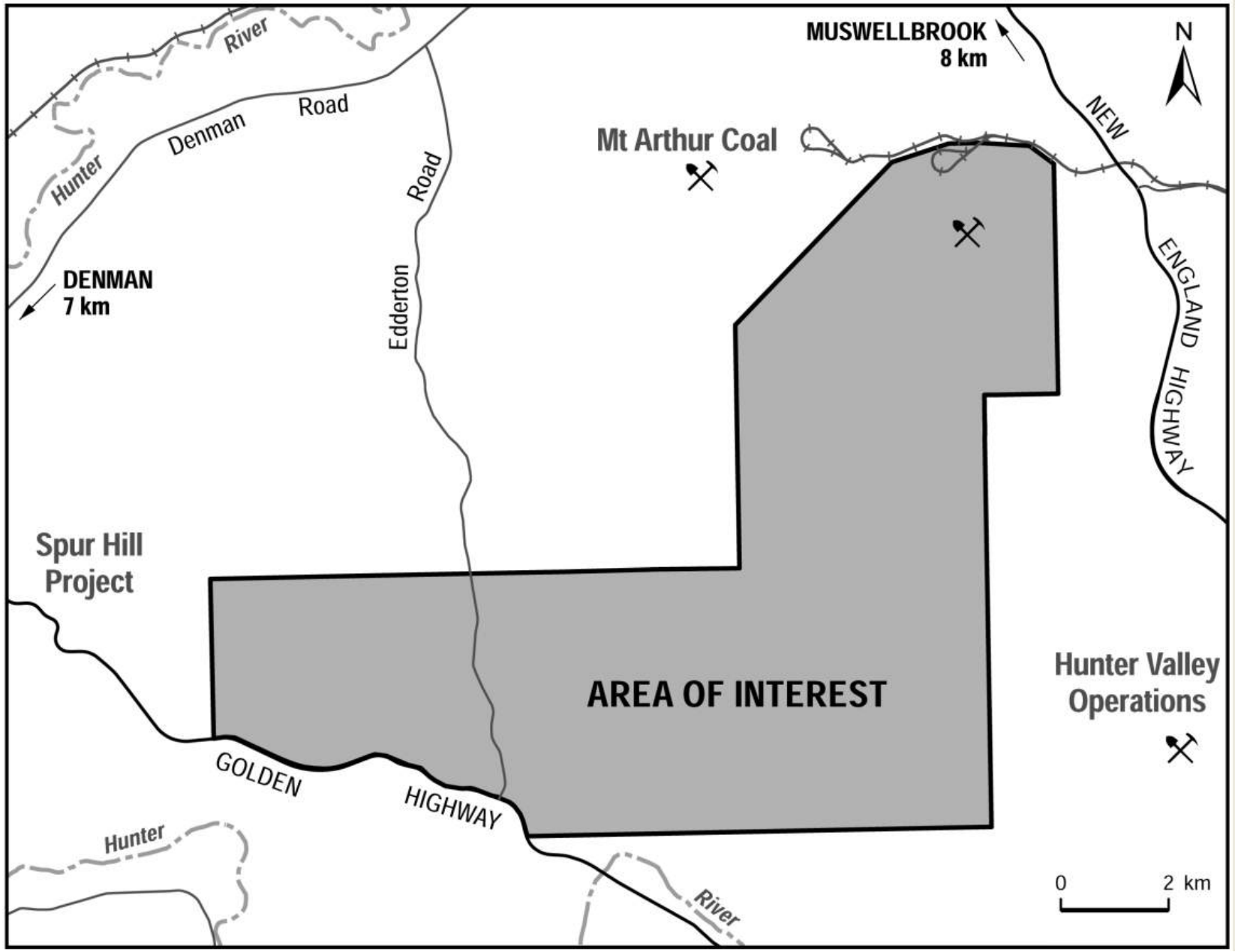
Kind regards,



Geordie Oakes
Archaeologist
Geordie.Oakes@aecom.com

Direct Dial: +61 2 8934 0610
Direct Fax: +61 2 8934 0001

Figure 3 Area of Interest



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

28 May 2018

Heritage Advisor
Muswellbrook Shire Council
PO Box 122
Muswellbrook NSW 2333

Dear Sir/Madam,

Request for Relevant Aboriginal Stakeholder Information for the Maxwell Project located in Muswellbrook and Singleton LGAs, NSW

I am writing to inform you that AECOM Australia Pty Ltd (AECOM) has been commissioned by Malabar Coal Limited to undertake an Aboriginal cultural heritage assessment for the Maxwell Project located to the east of Denman and south of Muswellbrook, within the local government areas of Muswellbrook and Singleton (the 'Area of Interest', Figure 1).

The Maxwell Project would extract coal through underground mining within the Wittingham Coal Measures for a mine life of approximately 26 years. The Maxwell Project would include the development of a mine infrastructure area adjacent to the mine entry. Coal when mined would be transferred to existing coal preparation and train loading infrastructure for processing and dispatch to markets. The Proponent for the Project is Maxwell Ventures (Management) Pty Ltd, a wholly owned subsidiary of Malabar Coal Limited (Level 26, 259 George Street, Sydney NSW 2000).

The purpose of this letter is to request from you, in accordance with cl 80C(2)(a) of the *National Parks and Wildlife Regulation 2009* and Section 4.1.2 of the Office of Environment and Heritage's (OEH) *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010), the name and contact details of Aboriginal individuals and/or organisations whom you consider may hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects/places in the Area of Interest, and who may be interested in being consulted. Could you please provide these details by 14 June 2018.

Should you have information regarding the above or have any questions, please don't hesitate to contact:

Geordie Oakes
c/- AECOM Australia Pty Ltd
PO Box Q410, QVB Post Office,
Sydney, NSW 1230
Ph: +61 2 8934 0610
Fax: +61 2 8934 0001
Email: Geordie.Oakes@aecom.com

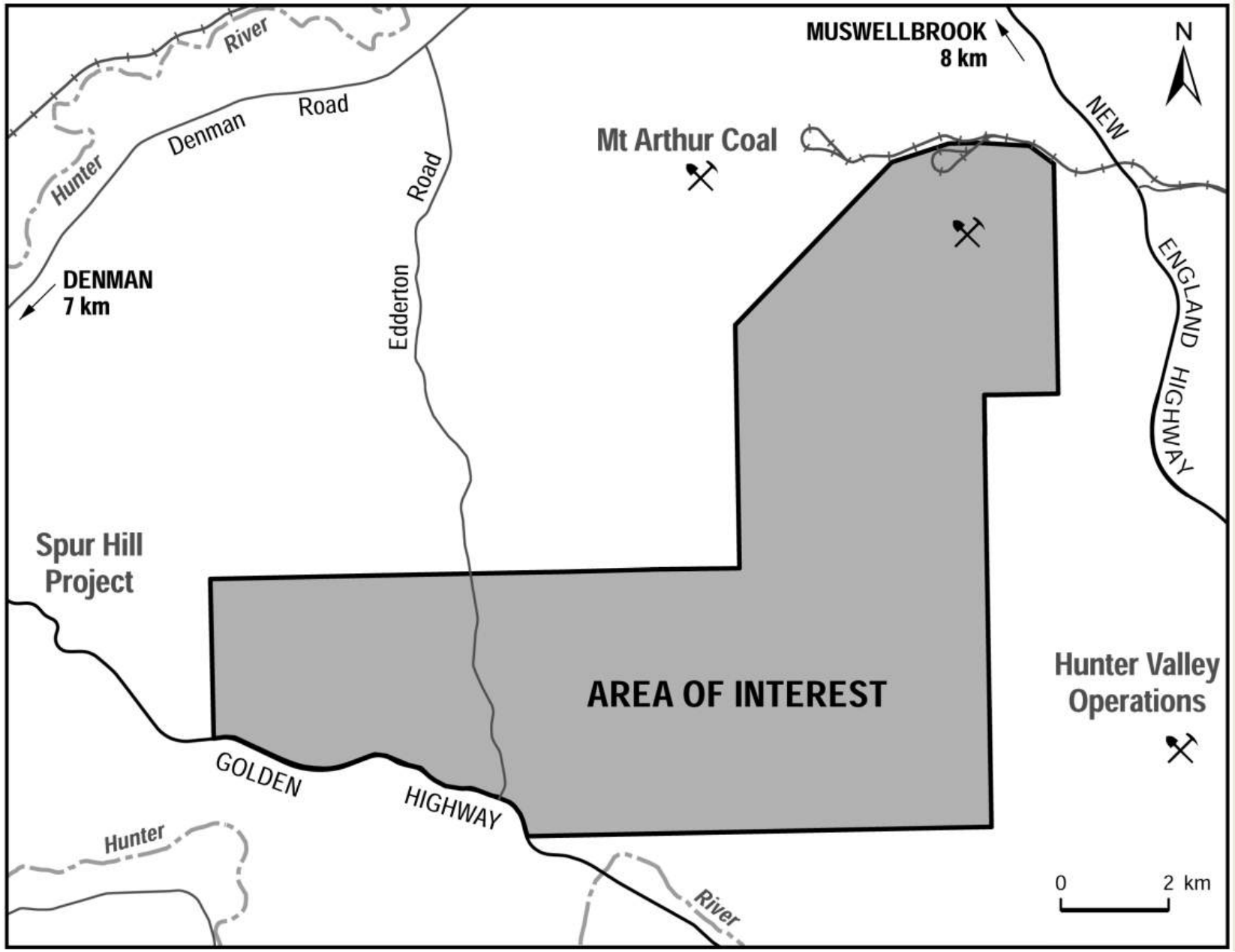
Kind regards,



Geordie Oakes
Archaeologist
Geordie.Oakes@aecom.com

Direct Dial: +61 2 8934 0610
Direct Fax: +61 2 8934 0001

Figure 4 Area of Interest



AECOM Imagine it. Delivered.

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

28 May 2018

Wanaruah Local Aboriginal Land Council
PO Box 127
Muswellbrook NSW 2333

Dear Sir/Madam,

I am writing to inform you that AECOM Australia Pty Ltd (AECOM) has been commissioned by Malabar Coal Limited to undertake an Aboriginal cultural heritage assessment for the Maxwell Project located to the east of Denman and south of Muswellbrook, within the local government areas of Muswellbrook and Singleton (the 'Area of Interest', Figure 1).

The Maxwell Project would extract coal through underground mining within the Wittingham Coal Measures for a mine life of approximately 26 years. The Maxwell Project would include the development of a mine infrastructure area adjacent to the mine entry. Coal when mined would be transferred to existing coal preparation and train loading infrastructure for processing and dispatch to markets. The Proponent for the Project is Maxwell Ventures (Management) Pty Ltd, a wholly owned subsidiary of Malabar Coal Limited (Level 26, 259 George Street, Sydney NSW 2000).

The purpose of this letter is to request from you, in accordance with cl 80C(2)(a) of the *National Parks and Wildlife Regulation 2009* and Section 4.1.2 of the Office of Environment and Heritage's (OEH) *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010), the name and contact details of Aboriginal individuals and/or organisations whom you consider may hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects/places in the Area of Interest, and who may be interested in being consulted. Could you please provide these details by 14 June 2018.

Should you have information regarding the above or have any questions, please don't hesitate to contact:

Geordie Oakes
c/- AECOM Australia Pty Ltd
PO Box Q410, QVB Post Office,
Sydney, NSW 1230
Ph: +61 2 8934 0610
Fax: +61 2 8934 0001
Email: Geordie.Oakes@aecom.com

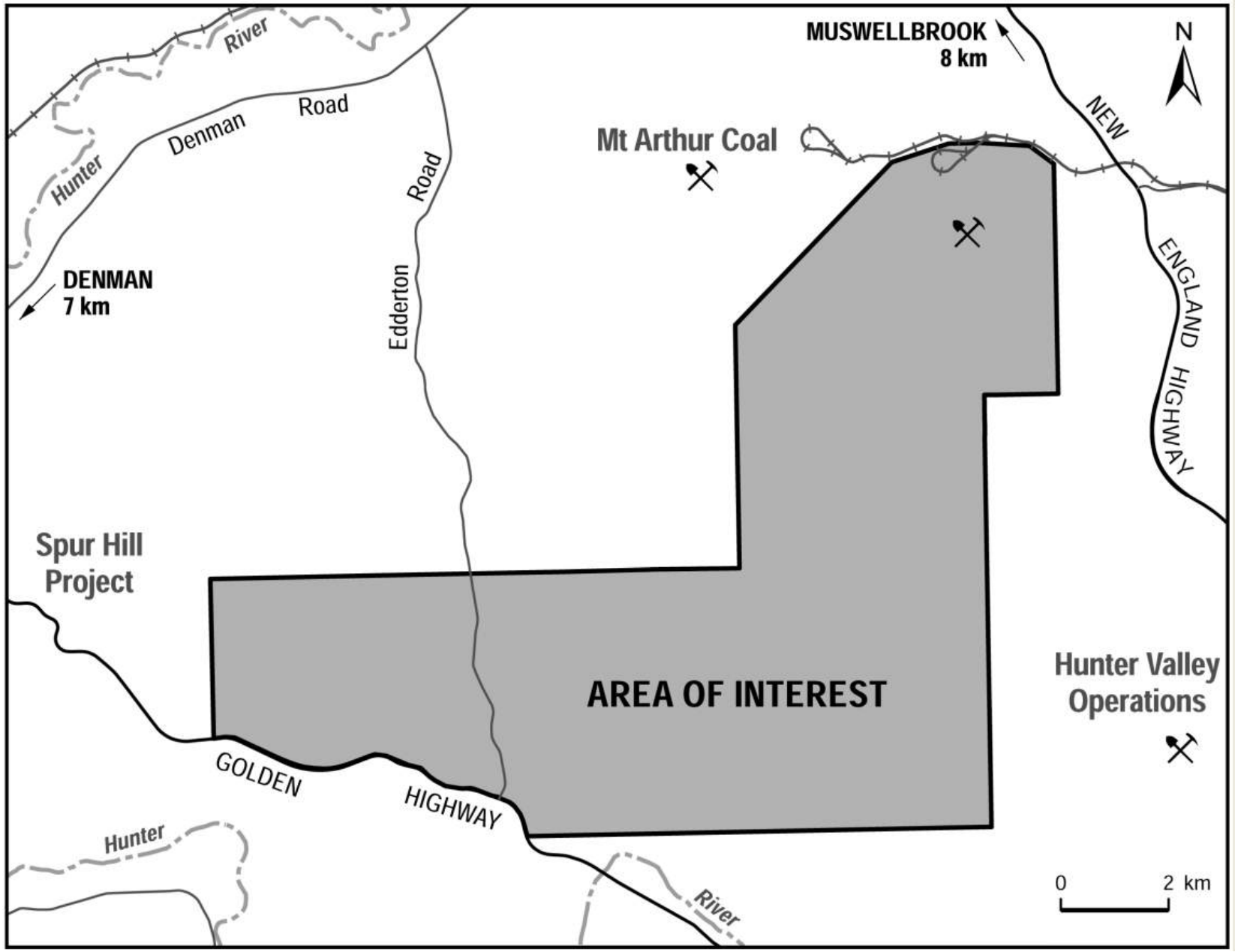
Kind regards,



Geordie Oakes
Archaeologist
Geordie.Oakes@aecom.com

Direct Dial: +61 2 8934 0610
Direct Fax: +61 2 8934 0001

Figure 5 Area of Interest



AECOM Imagine it. Delivered.

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

28 May 2018

Native Title Services Corporation Limited (NTSCorp Ltd)
PO Box 2105
Strawberry Hills NSW 2012

Dear Sir/Madam,

Request for Relevant Aboriginal Stakeholder Information for the Maxwell Project located in Muswellbrook and Singleton LGAs, NSW

I am writing to inform you that AECOM Australia Pty Ltd (AECOM) has been commissioned by Malabar Coal Limited to undertake an Aboriginal cultural heritage assessment for the Maxwell Project located to the east of Denman and south of Muswellbrook, within the local government areas of Muswellbrook and Singleton (the 'Area of Interest', Figure 1).

The Maxwell Project would extract coal through underground mining within the Wittingham Coal Measures for a mine life of approximately 26 years. The Maxwell Project would include the development of a mine infrastructure area adjacent to the mine entry. Coal when mined would be transferred to existing coal preparation and train loading infrastructure for processing and dispatch to markets. The Proponent for the Project is Maxwell Ventures (Management) Pty Ltd, a wholly owned subsidiary of Malabar Coal Limited (Level 26, 259 George Street, Sydney NSW 2000).

The purpose of this letter is to request from you, in accordance with cl 80C(2)(a) of the *National Parks and Wildlife Regulation 2009* and Section 4.1.2 of the Office of Environment and Heritage's (OEH) *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010), the name and contact details of Aboriginal individuals and/or organisations whom you consider may hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects/places in the Area of Interest, and who may be interested in being consulted. Could you please provide these details by 14 June 2018.

Should you have information regarding the above or have any questions, please don't hesitate to contact:

Geordie Oakes
c/- AECOM Australia Pty Ltd
PO Box Q410, QVB Post Office,
Sydney, NSW 1230
Ph: +61 2 8934 0610
Fax: +61 2 8934 0001
Email: Geordie.Oakes@aecom.com

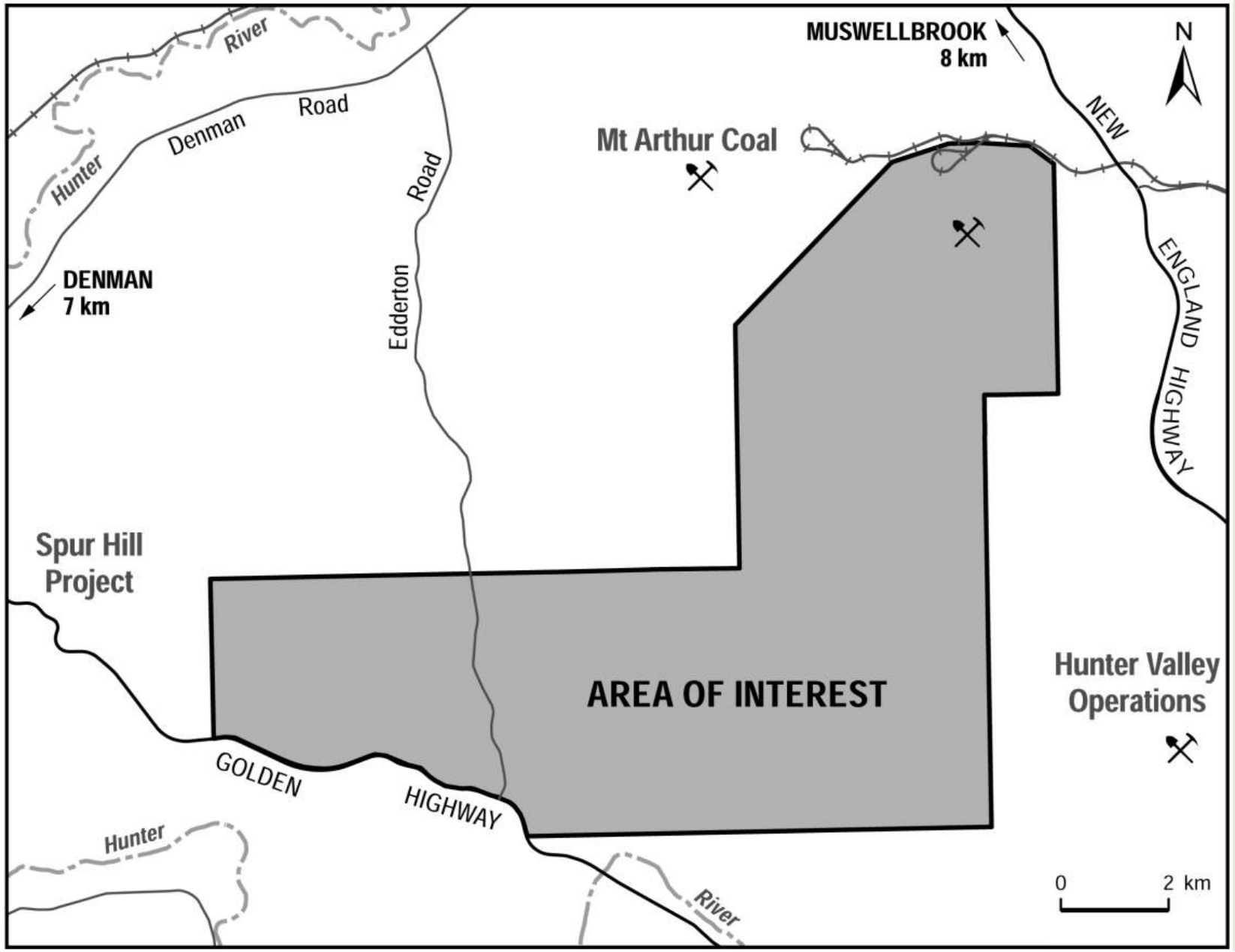
Kind regards,



Geordie Oakes
Archaeologist
Geordie.Oakes@aecom.com

Direct Dial: +61 2 8934 0610
Direct Fax: +61 2 8934 0001

Figure 6 Area of Interest



AECOM Imagine it. Delivered.

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

28 May 2018

National Native Title Tribunal
New South Wales – Sydney Office
GPO Box 9973
Sydney NSW 2000

Dear Sir/Madam,

Request for Relevant Aboriginal Stakeholder Information for the Maxwell Project located in Muswellbrook and Singleton LGAs, NSW

I am writing to inform you that AECOM Australia Pty Ltd (AECOM) has been commissioned by Malabar Coal Limited to undertake an Aboriginal cultural heritage assessment for the Maxwell Project located to the east of Denman and south of Muswellbrook, within the local government areas of Muswellbrook and Singleton (the 'Area of Interest', Figure 1).

The Maxwell Project would extract coal through underground mining within the Wittingham Coal Measures for a mine life of approximately 26 years. The Maxwell Project would include the development of a mine infrastructure area adjacent to the mine entry. Coal when mined would be transferred to existing coal preparation and train loading infrastructure for processing and dispatch to markets. The Proponent for the Project is Maxwell Ventures (Management) Pty Ltd, a wholly owned subsidiary of Malabar Coal Limited (Level 26, 259 George Street, Sydney NSW 2000).

The purpose of this letter is to request from you, in accordance with cl 80C(2)(a) of the *National Parks and Wildlife Regulation 2009* and Section 4.1.2 of the Office of Environment and Heritage's (OEH) *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010), the name and contact details of Aboriginal individuals and/or organisations whom you consider may hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects/places in the Area of Interest, and who may be interested in being consulted. Could you please provide these details by 14 June 2018.

Should you have information regarding the above or have any questions, please don't hesitate to contact:

Geordie Oakes
c/- AECOM Australia Pty Ltd
PO Box Q410, QVB Post Office,
Sydney, NSW 1230
Ph: +61 2 8934 0610
Fax: +61 2 8934 0001
Email: Geordie.Oakes@aecom.com

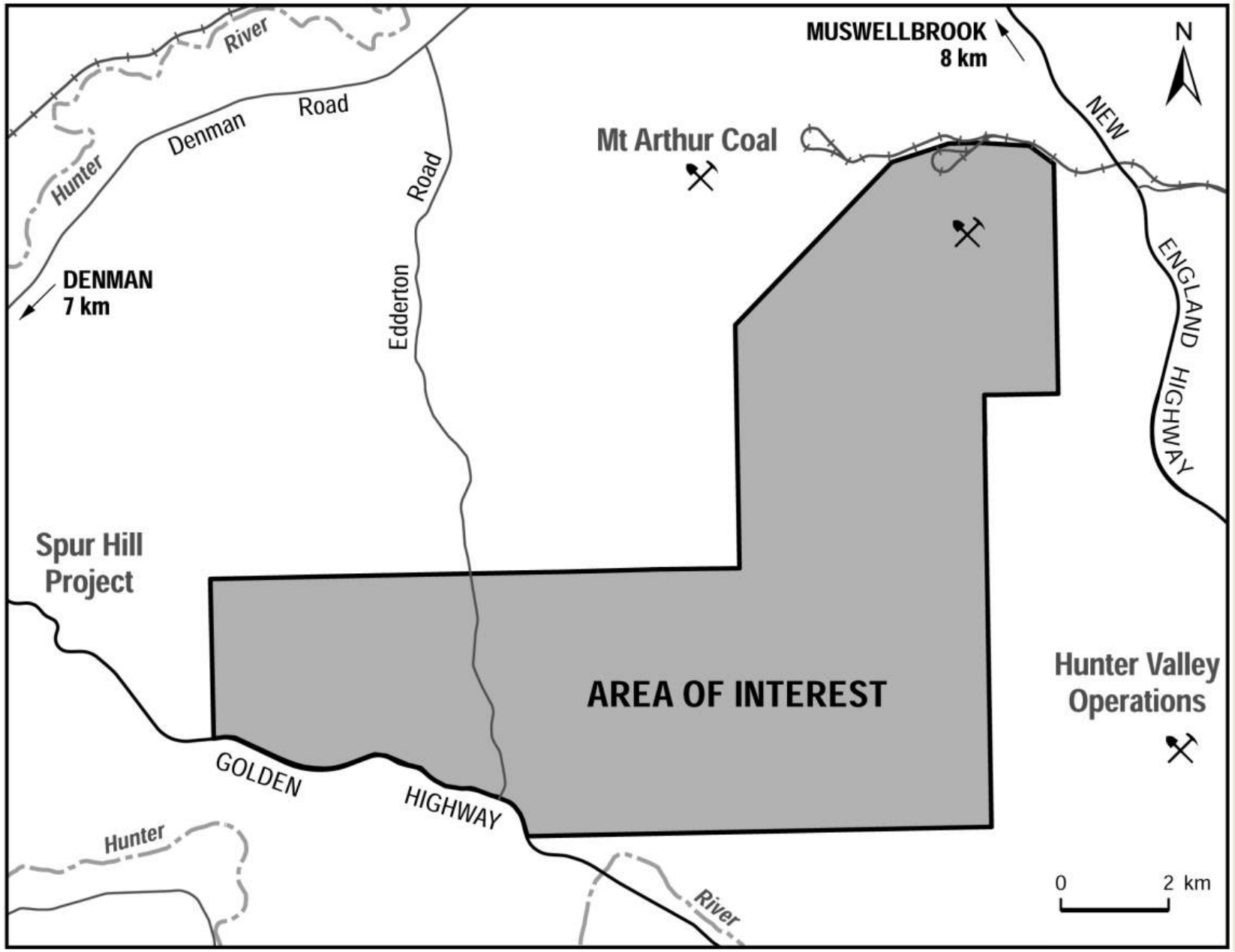
Kind regards,



Geordie Oakes
Archaeologist
Geordie.Oakes@aecom.com

Direct Dial: +61 2 8934 0610
Direct Fax: +61 2 8934 0001

Figure 7 Area of Interest



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

28 May 2018

Heritage Advisor
Singleton Council
PO Box 314
SINGLETON 2330

Dear Sir/Madam,

Request for Relevant Aboriginal Stakeholder Information for the Maxwell Project located in Muswellbrook and Singleton LGAs, NSW

I am writing to inform you that AECOM Australia Pty Ltd (AECOM) has been commissioned by Malabar Coal Limited to undertake an Aboriginal cultural heritage assessment for the Maxwell Project located to the east of Denman and south of Muswellbrook, within the local government areas of Muswellbrook and Singleton (the 'Area of Interest', Figure 1).

The Maxwell Project would extract coal through underground mining within the Wittingham Coal Measures for a mine life of approximately 26 years. The Maxwell Project would include the development of a mine infrastructure area adjacent to the mine entry. Coal when mined would be transferred to existing coal preparation and train loading infrastructure for processing and dispatch to markets. The Proponent for the Project is Maxwell Ventures (Management) Pty Ltd, a wholly owned subsidiary of Malabar Coal Limited (Level 26, 259 George Street, Sydney NSW 2000).

The purpose of this letter is to request from you, in accordance with cl 80C(2)(a) of the *National Parks and Wildlife Regulation 2009* and Section 4.1.2 of the Office of Environment and Heritage's (OEH) *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010), the name and contact details of Aboriginal individuals and/or organisations whom you consider may hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects/places in the Area of Interest, and who may be interested in being consulted. Could you please provide these details by 14 June 2018.

Should you have information regarding the above or have any questions, please don't hesitate to contact:

Geordie Oakes
c/- AECOM Australia Pty Ltd
PO Box Q410, QVB Post Office,
Sydney, NSW 1230
Ph: +61 2 8934 0610
Fax: +61 2 8934 0001
Email: Geordie.Oakes@aecom.com

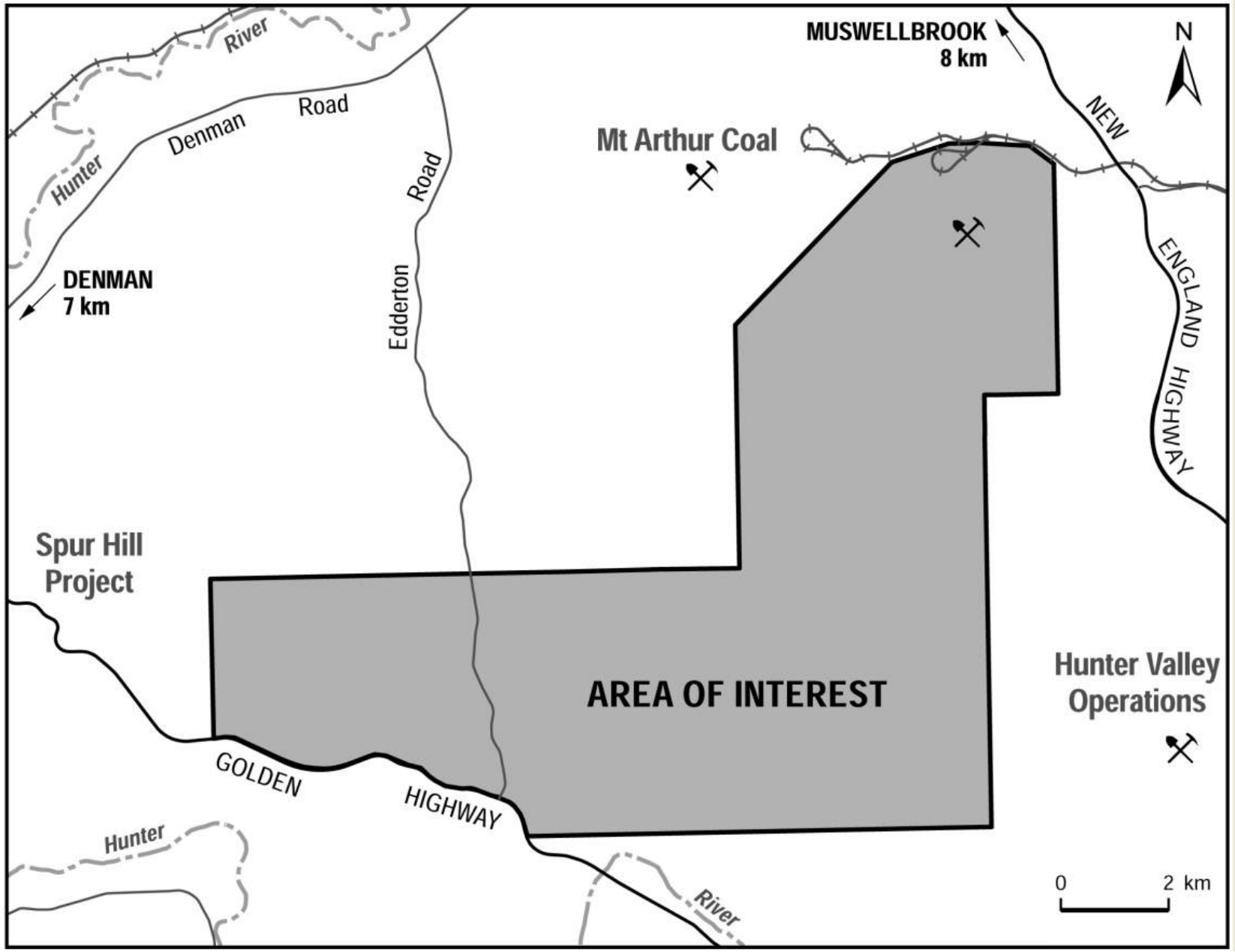
Kind regards,



Geordie Oakes
Archaeologist
Geordie.Oakes@aecom.com

Direct Dial: +61 2 8934 0610
Direct Fax: +61 2 8934 0001

Figure 8 Area of Interest



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

28 May 2018

Secretary
c/- Director Resource Assessments
Department of Planning & Environment
GPO Box 39, Sydney 2000

Dear Sir/Madam,

Request for Relevant Aboriginal Stakeholder Information for the Maxwell Project located in Muswellbrook and Singleton LGAs, NSW

I am writing to inform you that AECOM Australia Pty Ltd (AECOM) has been commissioned by Malabar Coal Limited to undertake an Aboriginal cultural heritage assessment for the Maxwell Project located to the east of Denman and south of Muswellbrook, within the local government areas of Muswellbrook and Singleton (the 'Area of Interest', Figure 1).

The Maxwell Project would extract coal through underground mining within the Wittingham Coal Measures for a mine life of approximately 26 years. The Maxwell Project would include the development of a mine infrastructure area adjacent to the mine entry. Coal when mined would be transferred to existing coal preparation and train loading infrastructure for processing and dispatch to markets. The Proponent for the Project is Maxwell Ventures (Management) Pty Ltd, a wholly owned subsidiary of Malabar Coal Limited (Level 26, 259 George Street, Sydney NSW 2000).

The purpose of this letter is to request from you, in accordance with cl 80C(2)(a) of the *National Parks and Wildlife Regulation 2009* and Section 4.1.2 of the Office of Environment and Heritage's (OEH) *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010), the name and contact details of Aboriginal individuals and/or organisations whom you consider may hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects/places in the Area of Interest, and who may be interested in being consulted. Could you please provide these details by 14 June 2018.

Should you have information regarding the above or have any questions, please don't hesitate to contact:

Geordie Oakes
c/- AECOM Australia Pty Ltd
PO Box Q410, QVB Post Office,
Sydney, NSW 1230
Ph: +61 2 8934 0610
Fax: +61 2 8934 0001
Email: Geordie.Oakes@aecom.com

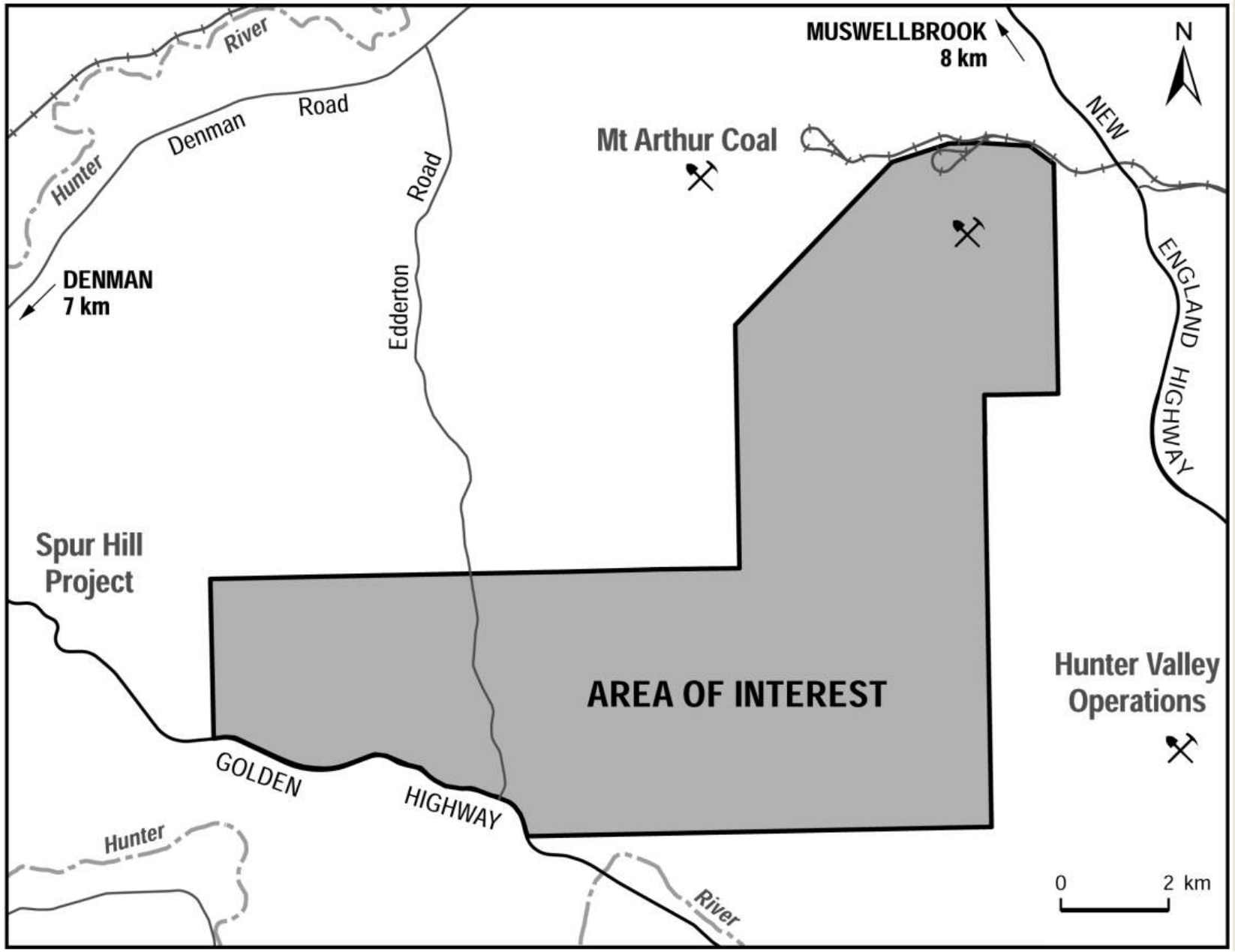
Kind regards,



Geordie Oakes
Archaeologist
Geordie.Oakes@aecom.com

Direct Dial: +61 2 8934 0610
Direct Fax: +61 2 8934 0001

Figure 9 Area of Interest



Appendix E

Agency Responses

Oakes, Geordie

From: Kim Manwarring <Kim.Manwarring@muswellbrook.nsw.gov.au>
Sent: Friday, 15 June 2018 9:28 AM
To: Oakes, Geordie
Cc: Scott Brooks
Subject: Request for Relevant Aboriignal Stakeholder Contacts

Good Moring Geordie

Please find contacts below regarding relevant Aboriginal Stakeholders in the Muswellbrook Area:

- Wanaruah Local Aboriginal Land Council, CEO Noel Downs, ceo.wanaruah@bigpond.com
  Administration Officer, Roz Thomson/ Jamie- Lee Stair, admin.wanaruah@bigpond.com

- Hunter Valley Aboriginal Corporation, Manager Ross Pahuru, Manager@hvabcorp.org.au;

For any further information please don't hesitate to contact me

Regards

Kim

Kim Manwarring
Acting Manager, Community Services

Direct: 02 6549 3764
Mobile: 0408 978 512

www.muswellbrook.nsw.gov.au

I respectfully acknowledge the local Aboriginal people who are the Traditional Owners and Custodians of the land on which I work.

muswellbrook shire council

explore www.workingwithindigenousaustralians.info

Oakes, Geordie

From:	Enquiries <Enquiries@nntt.gov.au>
Sent:	Wednesday, 13 June 2018 5:54 PM
To:	Oakes, Geordie
Subject:	RE: SR4375 2 x nsw searches attached SR4375
Attachments:	20180613_SR4375_NSW_Overlap_Report_Singleton_Shire_Council_LGA.xlsx; 20180613_SR4375_NSW_Overlap_Report_Muswellbrook-Shire_Council.xlsx

Native title search – NSW within Singleton and Muswellbrook Shire Council LGA
Your ref: N/A - Our ref: SR4375

Dear Geordie Oakes,

Thank you for your search request received on 13 June 2018 in relation to the above area, please find your results attached.

Please note: Where the area identified to be searched is indistinct, generalised, or is for a freehold parcel, the results provided may relate to the Local Government Area (LGA) or Local Aboriginal Land Council (ALC).

Search Results
The results provided are based on the information you supplied and are derived from a search of the following Tribunal databases:

- Schedule of Native Title Determination Applications
- Register of Native Title Claims
- Native Title Determinations
- Register of Indigenous Land Use Agreements
- Notified Indigenous Land Use Agreements

For more information about the Tribunal's registers or to search the registers yourself and obtain copies of relevant register extracts, please visit our website.

Please note: There may be a delay between a native title determination application being lodged in the Federal Court and its transfer to the Tribunal. As a result, some native title determination applications recently filed with the Federal Court may not appear on the Tribunal's databases.

The search results are based on analysis against external boundaries of applications only. Native title applications commonly contain exclusions clauses which remove areas from within the external boundary. To determine whether the areas described are in fact subject to claim, you need to refer to the "Area covered by claim" section of the relevant Register Extract or Schedule Extract and any maps attached.

Search results and the existence of native title
Please note that the enclosed information from the Register of Native Title Claims and/or the Schedule of Applications is not confirmation of the existence of native title in this area. This cannot be confirmed until the Federal Court makes a

determination that native title does or does not exist in relation to the area. Such determinations are registered on the National Native Title Register.

The Tribunal accepts no liability for reliance placed on enclosed information
The enclosed information has been provided in good faith. Use of this information is at your sole risk. The National Native Title Tribunal makes no representation, either express or implied, as to the accuracy or suitability of the information enclosed for any particular purpose and accepts no liability for use of the information or reliance placed on it.

If you have any further queries, please do not hesitate to contact us on the free call number 1800 640 501.

Regards,

Enquiries
Public enquiry hours are 8.30am to 4.30pm
National Native Title Tribunal | Perth
Facsimile (08) 9425 1193 | Email enquiries@nntt.gov.au
Freecall 1800 640 501 | www.nntt.gov.au
Shared Country Shared Future

DOC18/352193

Mr Geordie Oaks
AECOM Australia Pty Ltd
geordie.oaks@aecom.com

Dear Geordie

Maxwell Project

In response to your request under Section 4.1.2(a) of the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010), please find attached a list of known Aboriginal parties that have self-nominated for the Muswellbrook Shire Council and Singleton Council Local Government Areas (LGA). Please note the following information with respect to Aboriginal consultation for your project.

Aboriginal stakeholder lists maintained by OEH are comprised of self-nominated individuals and organisations

Please note that the attached list is comprised only of self-nominated individuals and Aboriginal organisations who could have an interest in your project. The list is not vetted by OEH. As the list comprises only of self-nominated individuals and Aboriginal organisations, it is not necessarily an exhaustive list of all Aboriginal parties who may hold an interest in the project. Further consultation in accordance with step 4.1.2 of the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010) is required to identify Aboriginal people who may hold either cultural or historical knowledge relevant to determining the significance of Aboriginal objects or places within your proposed project area.

Ensure you document the consultation process

Please ensure all consultation undertaken in accordance with the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010) is documented within an Aboriginal Cultural Heritage Assessment Report (ACHAR). This must include copies of all correspondence sent to or received from all Registered Aboriginal Parties (RAPs) throughout the entire consultation process. Omission of these records in the final ACHAR may cause delays in the assessment of an Aboriginal Heritage Impact Permit (AHIP) application or a major project Aboriginal cultural heritage assessment, and could require parts of the consultation process to be repeated if the evidence provided to OEH does not demonstrate that the consultation process has been conducted in accordance with our consultation requirements.

Demonstrate that reasonable consultation attempts have been made

Please ensure you provide evidence to demonstrate that reasonable attempts have been made to contact the relevant parties identified through step 4.1.2 of the *Aboriginal cultural heritage consultation*

requirements for proponents (DECCW 2010). If this evidence is not provided, OEH may deem that the consultation process has not complied with the consultation requirements. Similarly, the proponent is required to record all feedback received from RAPs, along with the proponent's response to the feedback. Where concerns or contentious issues are raised by RAPs during the consultation process, OEH expects that reasonable attempts are made to address and resolve these matters, however OEH acknowledges that in some cases, this may not be achievable. In the case where conflict cannot be resolved, it is the responsibility of the proponent to record these differences and provide the necessary information in their ACHAR with their AHIP application or major project ACHAR.

Consultation should not be confused with employment

As outlined in Section 3.4 of the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010), the consultation process involves getting the views of, and information from, Aboriginal people and reporting on these. It is not to be confused with other field assessment processes involved in preparing a proposal and an application. OEH does not have any role with respect to commercial engagement. Where RAPs are engaged commercially to provide field services as part of an assessment process, that is a matter for the proponent to manage as they see fit. However, if a proponent is proposing to undertake consultation processes or elicit cultural information from RAPs during the course of conducting a field survey, OEH considers this to form part of the consultation process, and expects that all RAPs would be afforded the opportunity to be involved in the process.

Contacting our office

To ensure we can respond to enquiries promptly, please direct future correspondence to our central mailbox: rog.hcc@environment.nsw.gov.au.

Should you require any further information, please do not hesitate to contact us.

Yours sincerely



STEVEN COX
Senior Team Leader Planning
Hunter Central Coast Branch
Regional Operations Division

15 June 2018

Attachment A

Hunter Central Coast Branch - Aboriginal Stakeholder Register for Muswellbrook Shire Council LGA

Please note that this list is valid at the time of sending only, and should not be used for subsequent projects.

Organisation	First name	Surname	Address 1	City	State	Post code	Landline	Mobile	Email
Aboriginal Native Title Elders Consultants	John and Margaret	Matthews	4 Calgaroo Avenue	MUSWELLBROOK	NSW	2333		0417 725 956	
AGA Services	Ashley, Gregory & Adam	Sampson	22 Ibis Parade	WOODBERRY	NSW	2322	Donna Sampson 0403 765 019	Ashley Sampson 0401 958 051	aga.services@hotmail.com
Aliera French Trading	Aliera	French	23B Gommera St	BLACKSMITHS	NSW	2281		0421 299 963	Aliera.french.trading@hotmail.com
Cacatua Culture Consultants	Donna & George	Sampson	22 Ibis Parade	WOODBERRY	NSW	2322		0434 877 016	cacatua4service@tpg.com.au
Crimson-Rosie	Jeffery	Matthews	6 Eucalypt Avenue	MUSWELLBROOK	NSW	2333	02 6543 4791		
Culturally Aware	Tracey	Skene	7 Crawford Place	MILFIELD	NSW	2325		0474 106 537	traceyamorrung-pa.com.au
D F T V Enterprises	Derrick	Vale Snr	5 Mountbatten Close	RUTHERFORD	NSW	2320		0438 812 197	deckavale@hotmail.com

Organisation	First name	Surname	Address 1	City	State	Post code	Landline	Mobile	Email
Deslee Talbott Consultants	Deslee	Matthews	Unit 2 / 19 South Street	GUNNEDAH	NSW	2380		0431 205 336	m-desley@hotmail.com
Divine Diggers Aboriginal Cultural Consultants	Deidre	Perkins	6 Ashleigh Street	HEDDON GRETA	NSW	2321	02 4937 4573	0425 654 290 preferred	dedemaree3@hotmail.com
Gidawaa Walang & Barkuma Neighbourhood Centre Inc.	Ann Hickey	Debbie Dacey-Sullivan	76 Lang Street	KURRI KURRI	NSW	2327	02 4937 1094	Anne 0411 196 991	gidawaa.walang@hotmail.com
Hunter Traditional Owner	Paulette	Ryan	165 Susan Street	SCONE	NSW	2337		0431 109 001	hto.paulette@gmail.com
Hunter Valley Aboriginal Corporation	Rhonda	Griffiths	182 Bridge St	MUSWELLBROOK	NSW	2333	02 6543 1180		h973809@bigpond.net.au
Hunters & Collectors	Tania	Matthews	U211 Walowa St	NARRABRI	NSW	2390	0409 193 612		Tamatthews10@hotmail.com
Jarban & Mugrebea	Les	Atkinson	11 Nelson Street	CESSNOCK	NSW	2325		0466 316 069	Les.atkinson@hotmail.com
Jumbunna Traffic Management Group Pty Ltd	Norm	Archibald	17 Flobern Ave	WAUCHOPE	NSW	2446		0413 718 149	jtmanagement@live.com.au
Kawul Cultural Services	Vicky	Slater	33 Gardner Circuit	SINGLETON	NSW	2330		0421 077 521	Vicki.slater@hotmail.com
Kawul Pty Ltd trading	Arthur	Fletcher	619 Main Road	GLENDALE	NSW	2285	02 4954 7751	0402 146 193	Wonn1sites@gmail.com

Organisation	First name	Surname	Address 1	City	State	Post code	Landline	Mobile	Email
as Wonn1 Sites									
Lower Hunter Aboriginal Incorporated	David	Ahoy	5 Killara Drive	CARDIFF SOUTH	NSW	2285		0421 329 520	lowerhunterai@gmail.com
Lower Hunter Wonnarua Cultural Services	Lea-Anne Ball and Uncle Tommy Miller		51 Bowden Street	HEDDON GRETA	NSW	2321	02 4937 2694	0402 636 521 (Uncle)	tn.miller@southernphone.com.au
Lower Wonnaruah Tribal Consultancy Pty Ltd	Barry	Anderson	156 The Inlet Road	BULGA	NSW	2330	02 6574 5303	0417 403 153	
Murra Bidgee Mullangari Aboriginal Corporation	Ryan Johnson	& Darleen Johnson-Carroll	PO Box 246	SEVEN HILLS	NSW	2147		0497 983 332	murrabidgeemullangari@yahoo.com.au
Myland Cultural & Heritage Group	Warren	Schillings	30 Taurus Street	ELERMORE VALE	NSW	2287		0431 392 554	warren@yarnteen.com.au
Roger Matthews Consultancy	Roger	Matthews	15 Parkinson Avenue	MUSWELLBROOK	NSW	2333		0455 671 288	
Ungooroo Aboriginal Corporation	Alan	Paget	PO Box 3095	SINGLETON	NSW	2330	02 6571 5111		admin@ungooroo.com.au
Wallagan Cultural Services	Maree	Waugh	PO Box 40	CESSNOCK	NSW	2325		0439 813 078	Mareewaugh30@hotmail.com

Organisation	First name	Surname	Address 1	City	State	Post code	Landline	Mobile	Email
Wattaka Wonnarua CC Service	Des	Hickey	4 Kennedy Street	SINGLETON	NSW	2330	6573 3786	0432 977 178	deshickey@bigpond.com
Widescope Indigenous Group	Steven	Hickey	73 Russell Street	EMU PLAINS	NSW	2750		0425 232 056 0425 230 693	Widescope.group@live.com
Wonnarua Culture Heritage	Gordon	Griffiths	19 O'Donnell Crescent	METFORD	NSW	2323	02 4934 6437	0401 028 807	
Wonnarua Elders Council	Richard	Edwards	PO Box 844	CESSNOCK	NSW	2325			
Wonnarua Nation Aboriginal Corporation	Laurie	Perry	254 John St	SINGLETON	NSW	2330	02 6571 5419	0412 593 020	l.perry@optusnet.com.au
Yarrawalk (A division of Tocomwall Pty Ltd), Tocomwall Pty Ltd on behalf of Scott Franks and Anor on behalf of the Plains Clans of the Wonnaru People NSD1680/2013	Scott	Franks	PO Box 76	CARRINGBAH	NSW	1495		0404 171 544	scott@tocomwall.com.au
Yinarr Cultural Services	Kathleen	Steward Kinchela	Lot 5 Westwood Estate	MERRIWA	NSW	2329		0475 436 589	yinarculturalservices@bigpond.com dontminemeay@gmail.com

Organisation	First name	Surname	Address 1	City	State	Post code	Landline	Mobile	Email
	Steve	Talbott	73 Kiah Road	GILLIESTON HEIGHTS	NSW	2321		0429 662 911	gomeroi.namoi@outlook.com
	Kevin	Duncan	95 Moala Parade	CHARMHAVEN	NSW	2263		02 4392 9346 0431 224 099	kevin.duncan@bigpond.com
Didge Ngunawal Clan	Paul Boyd	& Lilly Carroll	7 Siskin St	QUAKERS HILL	NSW	2763		0426823944	didgengunawalclan@yahoo.com.au
Indigenous Learning	Craig	Archibald	2 Victoria Street	BELLBIRD HEIGHTS	NSW	2325	0455 550 549	0467 229 507	ilearning@bigpond.com
Upper Hunter Wonnarua Council Inc	Rhoda & Georgina	Perry	PO Box 184	SINGLETON	NSW	2330		0421 233 239	

Office of Environment & Heritage

Attachment B

Hunter Central Coast Branch - Aboriginal Stakeholder Register for Singleton City Council LGA

Please note that this list is valid at the time of sending only, and should not be used for subsequent projects.

Organisation	First name	Surname	Address 1	City	State	Post code	Landline	Mobile	Email
Aboriginal Native Title Elders Consultants	John and Margaret	Matthews	4 Calgaroo Avenue	MUSWELLBROOK	NSW	2333			
AGA Services	Ashley, Gregory & Adam	Sampson	22 Ibis Parade	WOODBERRY	NSW	2322	Donna Sampson 0403 765 019	Ashley Sampson 0401 958 051	aga.services@hotmail.com
Aliera French Trading	Aliera	French	23B Gommera St	BLACKSMITHS	NSW	2281		0421 299 963	Aliera.french.trading@hotmail.com
Awabakal Traditional Owners Aboriginal Corporation	Kerrie	Brauer	PO Box 122	RUTHERFORD	NSW	2320	-	0412 866 357	Kerrie@awabakal.com.au
Cacatua Culture Consultants	Donna & George	Sampson	22 Ibis Parade	WOODBERRY	NSW	2322		0434 877 016	cacatua4service@tpg.com.au
Crimson-Rosie	Jeffery	Matthews	6 Eucalypt Avenue	MUSWELLBROOK	NSW	2333	02 6543 4791		
Culturally Aware	Tracey	Skene	7 Crawford Place	MILFIELD	NSW	2325		0474 106 537	traceyamorrung-pa.com.au

Organisation	First name	Surname	Address 1	City	State	Post code	Landline	Mobile	Email
D F T V Enterprises	Derrick	Vale Snr	5 Mountbatten Close	RUTHERFORD	NSW	2320		0438 812 197	deckavale@hotmail.com
Deslee Talbott Consultants	Deslee	Matthews	Unit 2 / 19 South Street	GUNNEDAH	NSW	2380		0431 205 336	m-desley@hotmail.com
Divine Diggers Aboriginal Cultural Consultants	Deidre	Perkins	6 Ashleigh Street	HEDDON GRETA	NSW	2321	02 4937 4573		dedemaree3@hotmail.com
Gidawaa Walang & Barkuma Neighbourhood Centre Inc.	Ann Hickey	Debbie Dacey-Sullivan	76 Lang Street	KURRI KURRI	NSW	2327	02 4937 1094		gidawaa.walang@hotmail.com
Guringai Tribal Link Aboriginal Corporation	Tracey	Howie	PO Box 4061	WYONGAH	NSW	2259	02 4396 8743		tracey@guringai.com.au
Hunter Traditional Owner	Paulette	Ryan	165 Susan Street	SCONE	NSW	2337		0431 109 001	hto.paulette@gmail.com
Hunter Valley Aboriginal Corporation	Rhonda	Griffiths	182 Bridge St	MUSWELLBROOK	NSW	2333	02 6543 1180		h973809@bigpond.net.au
Hunters & Collectors	Tania	Matthews	U211 Walowa St	NARRABRI	NSW	2390		0409 193 612	Tamatthews10@hotmail.com
Jarban & Mugrebea	Les	Atkinson	11 Nelson Street	CESSNOCK	NSW	2325		0466 316 069	Les.atkinson@hotmail.com
Jumbunna Traffic Management Group Pty Ltd	Norm	Archibald	17 Flobern Ave	WAUCHOPE	NSW	2325		0413 718 149	jtmanagement@live.com.au
Kauma Pondee Inc.	Jill	Green	Unit 6/1 Central Street	LAMBTON	NSW	2305		0434 210 190	kaumapondee@live.com.au
Kawul Cultural Services	Vicky	Slater	33 Gardner Circuit	SINGLETON	NSW	2330		0421 077 521	Vicki.slater@hotmail.com
Kawul Pty Ltd trading as Wonn1 Sites	Arthur	Fletcher	619 Main Road	GLENDALE	NSW	2285	02 4954 7751	02 4954 7751	Wonn1sites@gmail.com

Organisation	First name	Surname	Address 1	City	State	Post code	Landline	Mobile	Email
Lower Hunter Aboriginal Incorporated	David	Ahoy	5 Killara Drive	CARDIFF SOUTH	NSW	2285		0421 329 520	lowerhunterai@gmail.com
Lower Hunter Wonnarua Cultural Services	Lea-Anne Ball and Uncle Tommy Miller		51 Bowden Street	HEDDON GRETA	NSW	2321	02 4937 2694	02 4937 2694	tn.miller@southernphone.com.au
Lower Wonnaruah Tribal Consultancy Pty Ltd	Barry	Anderson	156 The Inlet Road	BULGA	NSW	2330	02 6574 5303		-
Murra Bidgee Mullangari Aboriginal Corporation	Ryan Johnson	& Darleen Johnson-Carroll	PO Box 246	SEVEN HILLS	NSW	2147		0497 983 332	murrabidgeemullangari@yahoo.com.au
Myland Cultural & Heritage Group	Warren	Schillings	30 Taurus Street	ELERMORE VALE	NSW	2287		0431 392 554	warren@yarnteen.com.au
Roger Matthews Consultancy	Roger	Matthews	15 Parkinson Avenue	MUSWELLBROOK	NSW	2333		0455 671 288	
Ungooroo Aboriginal Corporation	Alan	Paget	PO Box 3095	SINGLETON	NSW	2330	02 6571 5111		admin@ungooroo.com.au
Wallagan Cultural Services	Maree	Waugh	PO Box 40	CESSNOCK	NSW	2325		0439 813 078	Mareewaugh30@hotmail.com
Wattaka Wonnarua CC Service	Des	Hickey	4 Kennedy Street	SINGLETON	NSW	2330		0432 977 178	deshickey@bigpond.com

Organisation	First name	Surname	Address 1	City	State	Post code	Landline	Mobile	Email
Widescope Indigenous Group	Steven	Hickey	73 Russell Street	EMU PLAINS	NSW	2750		0425 232 056 or 0425 230 693	Widescope.group@live.com
Wonnarua Culture Heritage	Gordon	Griffiths	19 O'Donnell Crescent	METFORD	NSW	2323	02 4934 6437	0401 028 807	
Wonnarua Elders Council	Richard	Edwards	PO Box 844	CESSNOCK	NSW	2325			
Wonnarua Nation Aboriginal Corporation	Laurie	Perry	254 John St	SINGLETON	NSW	2330		0412 593 020	l.perry@optusnet.com.au
Yarrawalk (A division of Tocomwall Pty Ltd), Tocomwall Pty Ltd on behalf of Scott Franks and Anor on behalf of the Plains Clans of the Wonnaru People NSD1680/2013	Scott	Franks	PO Box 76	CARRINGBAH	NSW	1495		0404 171 544	scott@tocomwall.com.au
Yinarr Cultural Services	Kathleen	Steward Kinchela	Lot 5 Westwood Estate	MERRIWA	NSW	2329		0475 436 589	yinarculturalservices@bigpond.com dontminemeay@gmail.com
	Carol	Ridgeway-Bissett	33 Ullora Road	NELSONS BAY	NSW	2315	02 4984 3113	02 4984 3113	
	Steve	Talbott	73 Kiah Road	GILLIESTON HEIGHTS	NSW	2321		0429 662 911	gomeroi.namoi@outlook.com
Didge Ngunawal Clan	Paul Boyd	& Lilly Carroll	7 Siskin St	QUAKERS HILL	NSW	2763		0426 823 944	didgengunawalclan@yahoo.com.au

OFFICE OF THE REGISTRAR
ABORIGINAL LAND RIGHTS ACT 1983 (NSW)

6 May 2018

Geordie Oakes
AECOM Australia Pty Ltd
Level 21,420 George Street
SYDNEY NSW 2000

Dear Geordie

Re: Request - Search for Registered Aboriginal Owners

I refer to your letter dated 28 May 2018 regarding an Aboriginal Cultural Heritage Assessment of the proposed Maxwell project located within Muswellbrook and Singleton LGA, NSW.

I have searched the Register of Aboriginal Owners and the project area described does not have Registered Aboriginal Owners pursuant to Division 3 of the Aboriginal Land Rights Act 1983.

I suggest that you contact Wanaruah Local Aboriginal Land Council on 02 6543 1288. They may be able to assist you in identifying other Aboriginal stakeholders for this project.

Yours sincerely



Jodie Rikiti
Administration Officer
Office of the Registrar, ALRA

Address: Level 3, 2 – 10 Wentworth Street, PARRAMATTA NSW 2150
Post: P.O Box 5068, PARRAMATTA NSW 2124
Phone: 02 8633 1266

Oakes, Geordie

From: Davey, Brooke <bdavey@singleton.nsw.gov.au>
Sent: Tuesday, 5 June 2018 2:02 PM
To: Oakes, Geordie
Subject: Response to request for aboriginal stakeholder information - Maxwell Project located in Muswellbrook and Singleton LGA

Good afternoon Geordie

Council would consider the Wonnarua Nation Aboriginal Corporation to be the body/organisation best placed to advise on Aboriginal objects/places in the area of interest.

Their website us below and contains contact details and other relevant information.

https://www.wonnarua.org.au/

If there is anything else I can assist with, please get in touch.

Thanks



BROOKE DAVEY
Development Planner
T 02 6578 7290
E bdavey@singleton.nsw.gov.au
W singleton.nsw.gov.au

Appendix F

Advertisement: Hunter Valley News

Aboriginal Cultural Heritage Assessment

Maxwell Project

Muswellbrook and Singleton LGA, NSW

Maxwell Ventures (Management) Pty Ltd (ACN 002 028 257), a wholly owned subsidiary of Malabar Coal Limited

Level 26, 259 George Street, Sydney NSW 2000

Notice given under cl 80(2)(c) of the *National Parks and Wildlife Regulation 2009 and Section 4.1.3 of the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*

AECOM on behalf of Malabar Coal Limited is seeking to identify Aboriginal persons or organisations who wish to be consulted in relation to an Aboriginal Cultural Heritage Assessment being prepared for the Maxwell Project. The Maxwell Project is located in the Upper Hunter Valley, to the east of Denman and south of Muswellbrook, adjacent to Edderton Road. The Maxwell Project would extract coal using underground mining methods and would include the development of a mine infrastructure area adjacent to the mine entry. Coal when mined would be transferred to existing coal preparation and train loading infrastructure for processing and dispatch to markets.

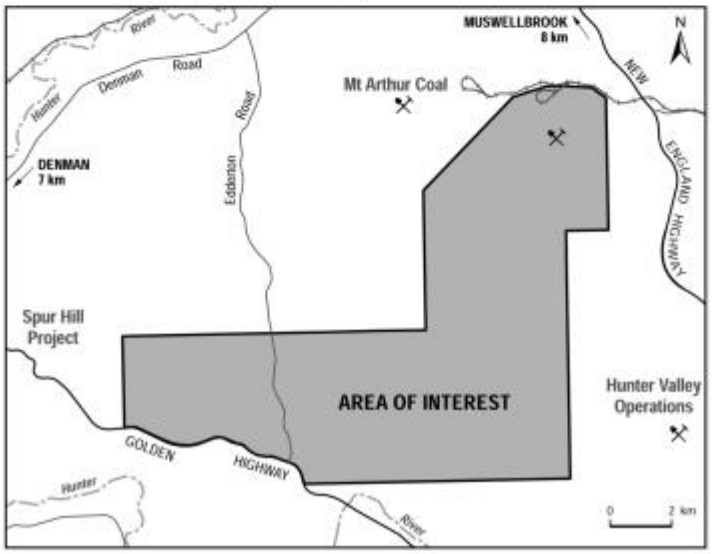
Approval for the Maxwell Project would be sought under the State Significant Development provisions (Division 4.7) of Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) and the NSW Environmental Planning and Assessment Regulation, 2000.

The purpose of community consultation with Aboriginal people is to assist the proposed applicant in the preparation of an application for an Aboriginal Heritage Impact Permit and to assist the Director General of OEH in his or her consideration and determination of the application.

Interested Aboriginal persons or stakeholders who hold cultural knowledge relevant to determining the significance of Aboriginal object(s) and/or place(s) in the Area of interest and wish to participate in a process of community consultation with the proponent regarding the proposed activity are requested to register their interest in writing to:

Geordie Oakes
c/- AECOM Australia Pty Ltd
PO Box Q410, QVB Post Office,
Sydney, NSW 1230
Ph: +61 2 8934 0610
Fax: +61 2 8934 0001
Email: Geordie.Oakes@aecom.com

Please be advised that if you register an interest in consultation, your details will be forwarded to the Office of Environment and Heritage and the Wanaruah Local Aboriginal Land Council, unless you specify that you do not want your details released. The closing date for registration is 4/07/18.



Appendix G

OEH and LALC Notification

AECOM Imagine it. Delivered.

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

20 September 2018

Wanaruah Local Aboriginal Land Council
PO Box 127
Muswellbrook NSW 2333

To Whom it May Concern,

Notification of Registered Aboriginal Parties (RAPs) for the Maxwell Project located in Muswellbrook LGA, NSW

In accordance with Section 4.1.6 of OEH's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*, please find enclosed for your records a list of the Aboriginal organisations and individuals who have registered an interest in being consulted for an Aboriginal Cultural Heritage Assessment being undertaken by AECOM Australia Pty Ltd (AECOM) for the proposed for the Maxwell Project, located in Muswellbrook LGA, NSW.

As was stated in the letters of invitation issued to Aboriginal organisations and individuals requesting registrations of interest, the official registration period for this project closed on 4 July 2018. However, registrations received after the closing date were accepted. A copy of the invitation is attached to this letter as well as the newspaper advertisement stakeholder request.

A total of 25 registrations of interest have been received regarding consultation for this project (Table 1). Please note that in accordance with Section 4.1.5 of the Consultation Requirements, AECOM provides the opportunity for Registered Aboriginal Parties (RAPs) to withhold their details from being forwarded on to the Local Aboriginal Land Council and/or OEH, and respects the wishes of RAPs to withhold their details at their discretion. No RAPs requested that their details be withheld in regard to this project.

Table 1 List of Registered Aboriginal Parties

Organisation	Date of registration	Method	Contact Person
DNC	19-Jun-18	Email	Paul Boyd
WLALC	20-Jun-18	Email	Jamie-Lee
Margaret Mathews	20-Jun-18	Phone	Margaret Mathews
n/a	20-Jun-18	Phone	Deidre Perkins
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
Ungaroo Aboriginal Corporation	21-Jun-18	Email	Allen Paget
Tocomwall Pty Ltd	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	Tom Miller
Murra Bidgee Mullangari	28-Jun-18	Email	Ryan Johnson

Organisation	Date of registration	Method	Contact Person
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

Yours faithfully,



Geordie Oakes
Archaeologist
geordie.oakes@aecom.com

Direct Dial: +64 2 89340610
Direct Fax: +64 2 89340001

Aboriginal Cultural Heritage Assessment

Maxwell Project

Muswellbrook and Singleton LGA, NSW

Maxwell Ventures (Management) Pty Ltd (ACN 002 028 257), a wholly owned subsidiary of Malabar Coal Limited

Level 26, 259 George Street, Sydney NSW 2000

Notice given under cl 80(2)(c) of the *National Parks and Wildlife Regulation 2009 and Section 4.1.3 of the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*

AECOM on behalf of Malabar Coal Limited is seeking to identify Aboriginal persons or organisations who wish to be consulted in relation to an Aboriginal Cultural Heritage Assessment being prepared for the Maxwell Project. The Maxwell Project is located in the Upper Hunter Valley, to the east of Denman and south of Muswellbrook, adjacent to Edderton Road. The Maxwell Project would extract coal using underground mining methods and would include the development of a mine infrastructure area adjacent to the mine entry. Coal when mined would be transferred to existing coal preparation and train loading infrastructure for processing and dispatch to markets.

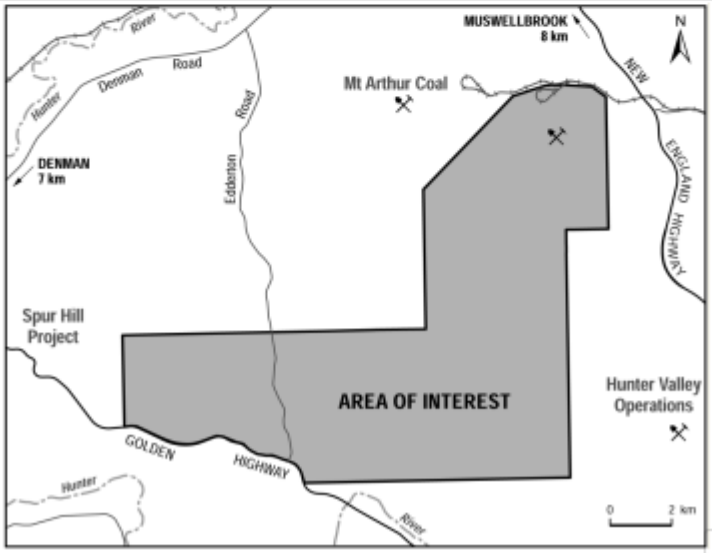
Approval for the Maxwell Project would be sought under the State Significant Development provisions (Division 4.7) of Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) and the NSW Environmental Planning and Assessment Regulation, 2000.

The purpose of community consultation with Aboriginal people is to assist the proposed applicant in the preparation of an application for an Aboriginal Heritage Impact Permit and to assist the Director General of OEH in his or her consideration and determination of the application.

Interested Aboriginal persons or stakeholders who hold cultural knowledge relevant to determining the significance of Aboriginal object(s) and/or place(s) in the Area of Interest and wish to participate in a process of community consultation with the proponent regarding the proposed activity are requested to register their interest in writing to:

Geordie Oakes
c/- AECOM Australia Pty Ltd
PO Box Q410, QVB Post Office,
Sydney, NSW 1230
Ph: +61 2 8934 0610
Fax: +61 2 8934 0001
Email: Geordie.Oakes@aecom.com

Please be advised that if you register an interest in consultation, your details will be forwarded to the Office of Environment and Heritage and the Wanaruah Local Aboriginal Land Council, unless you specify that you do not want your details released. The closing date for registration is 4/07/18.



AECOM Imagine it. Delivered.

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

15 June 2018

Upper Hunter Wonnarua Council Inc.
Rhoda & Georgina Perry
PO Box 184
SINGLETON NSW 2330

Dear Sir/Madam,

RE: Aboriginal Community Consultation for the Maxwell Project located in Muswellbrook and Singleton LGAs, NSW

I am writing to inform you that AECOM Australia Pty Ltd (AECOM) has been commissioned by Malabar Coal Limited to undertake an Aboriginal cultural heritage assessment for the Maxwell Project located to the east of Denman and south of Muswellbrook, within the Muswellbrook and Singleton local government areas (the 'Area of Interest', Figure 1).

The Maxwell Project would extract coal through underground mining within the Wittingham Coal Measures for a mine life of approximately 26 years. The Maxwell Project would include the development of a mine infrastructure area adjacent to the mine entry. Coal when mined would be transferred to existing coal preparation and train loading infrastructure for processing and dispatch to markets.

The Proponent for the Project is Maxwell Ventures (Management) Pty Ltd, a wholly owned subsidiary of Malabar Coal Limited (Level 26, 259 George Street, Sydney NSW 2000).

You have been identified by the Office of Environment and Heritage (OEH) as an Aboriginal person or organisation with the potential to hold cultural knowledge relevant to determining the significance of Aboriginal objects and places within the area of interest. Accordingly, AECOM is inviting you to participate in community consultation for this project.

To register your interest to be consulted about this project, please contact the following:

Geordie Oakes
c/- AECOM Australia Pty Ltd
PO Box Q410, QVB Post Office,
Sydney, NSW 1230
Ph: +61 2 8934 0610
Fax: +61 2 8934 0001
Email: geordie.oakes@aecom.com

To be involved in the consultation process, registrations must be received by 4 July 2018.

This notification is given in accordance with cl 80C (2)(b) of the *National Parks and Wildlife Regulation 2009* and section 4.1.3 of the Office of Environment and Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW,2010). The purpose of community consultation with Aboriginal people is to assist the proposed applicant in the preparation of an application for an Aboriginal Heritage Impact Permit and to assist the Director General of OEH in his or her consideration and determination of the application.

Please be advised that if you register an interest in consultation, your details will be forwarded to the Office of Environment and Heritage and the Wanaruah Local Aboriginal Land Council, unless you specify that you do not want your details released.

SAMPLE

AECOM Imagine it. Delivered.

Kind regards,



Geordie Oakes
Archaeologist
Geordie.Oakes@aecom.com

Direct Dial: +61 2 8934 0610
Direct Fax: +61 2 8934 0001

SAMPLE

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

20 September 2018

Archaeologist
Aboriginal Heritage Section
Office of Environment and Heritage NSW
Locked Bag 1002
Dangar NSW 2309

To Whom it May Concern,

Notification of Registered Aboriginal Parties (RAPs) for the Maxwell Project located in Muswellbrook LGA, NSW

In accordance with Section 4.1.6 of OEH's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*, please find enclosed for your records a list of the Aboriginal organisations and individuals who have registered an interest in being consulted for an Aboriginal Cultural Heritage Assessment being undertaken by AECOM Australia Pty Ltd (AECOM) for the proposed for the Maxwell Project, located in Muswellbrook LGA, NSW.

As was stated in the letters of invitation issued to Aboriginal organisations and individuals requesting registrations of interest, the official registration period for this project closed on 4 July 2018. However, registrations received after the closing date were accepted. A copy of the invitation is attached to this letter as well as the newspaper advertisement stakeholder request.

A total of 25 registrations of interest have been received regarding consultation for this project (Table 1). Please note that in accordance with Section 4.1.5 of the Consultation Requirements, AECOM provides the opportunity for Registered Aboriginal Parties (RAPs) to withhold their details from being forwarded on to the Local Aboriginal Land Council and/or OEH, and respects the wishes of RAPs to withhold their details at their discretion. No RAPs requested that their details be withheld in regard to this project.

Table 1 List of Registered Aboriginal Parties

Organisation	Date of registration	Method	Contact Person
DNC	19-Jun-18	Email	Paul Boyd
WLALC	20-Jun-18	Email	Jamie-Lee
Margaret Mathews	20-Jun-18	Phone	Margaret Mathews
n/a	20-Jun-18	Phone	Deidre Perkins
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
Ungaroo Aboriginal Corporation	21-Jun-18	Email	Allen Paget
Tocomwall Pty Ltd	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	Tom Miller
Murra Bidgee Mullangari	28-Jun-18	Email	Ryan Johnson

Organisation	Date of registration	Method	Contact Person
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

Yours faithfully,



Geordie Oakes
Archaeologist
geordie.oakes@aecom.com

Direct Dial: +64 2 89340610
Direct Fax: +64 2 89340001

Aboriginal Cultural Heritage Assessment

Maxwell Project

Muswellbrook and Singleton LGA, NSW

Maxwell Ventures (Management) Pty Ltd (ACN 002 028 257), a wholly owned subsidiary of Malabar Coal Limited

Level 26, 259 George Street, Sydney NSW 2000

Notice given under cl 80(2)(c) of the *National Parks and Wildlife Regulation 2009 and Section 4.1.3 of the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*

AECOM on behalf of Malabar Coal Limited is seeking to identify Aboriginal persons or organisations who wish to be consulted in relation to an Aboriginal Cultural Heritage Assessment being prepared for the Maxwell Project. The Maxwell Project is located in the Upper Hunter Valley, to the east of Denman and south of Muswellbrook, adjacent to Edderton Road. The Maxwell Project would extract coal using underground mining methods and would include the development of a mine infrastructure area adjacent to the mine entry. Coal when mined would be transferred to existing coal preparation and train loading infrastructure for processing and dispatch to markets.

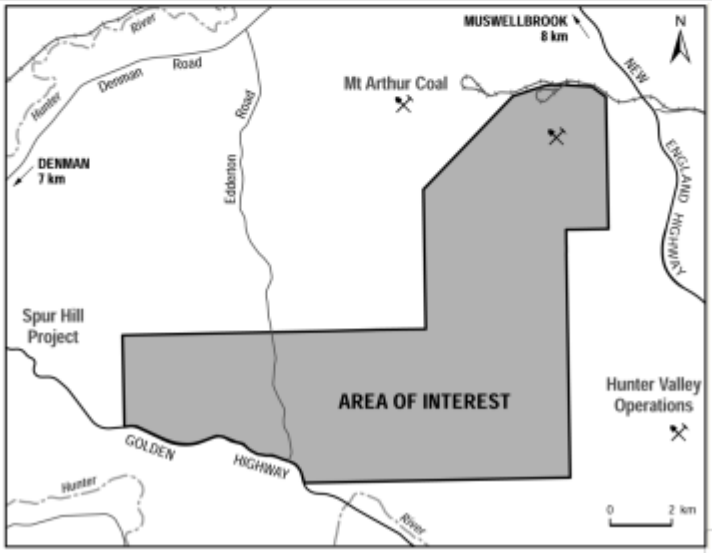
Approval for the Maxwell Project would be sought under the State Significant Development provisions (Division 4.7) of Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) and the NSW Environmental Planning and Assessment Regulation, 2000.

The purpose of community consultation with Aboriginal people is to assist the proposed applicant in the preparation of an application for an Aboriginal Heritage Impact Permit and to assist the Director General of OEH in his or her consideration and determination of the application.

Interested Aboriginal persons or stakeholders who hold cultural knowledge relevant to determining the significance of Aboriginal object(s) and/or place(s) in the Area of Interest and wish to participate in a process of community consultation with the proponent regarding the proposed activity are requested to register their interest in writing to:

Geordie Oakes
c/- AECOM Australia Pty Ltd
PO Box Q410, QVB Post Office,
Sydney, NSW 1230
Ph: +61 2 8934 0610
Fax: +61 2 8934 0001
Email: Geordie.Oakes@aecom.com

Please be advised that if you register an interest in consultation, your details will be forwarded to the Office of Environment and Heritage and the Wanaruah Local Aboriginal Land Council, unless you specify that you do not want your details released. The closing date for registration is 4/07/18.



AECOM Imagine it. Delivered.

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

15 June 2018

Upper Hunter Wonnarua Council Inc.
Rhoda & Georgina Perry
PO Box 184
SINGLETON NSW 2330

Dear Sir/Madam,

RE: Aboriginal Community Consultation for the Maxwell Project located in Muswellbrook and Singleton LGAs, NSW

I am writing to inform you that AECOM Australia Pty Ltd (AECOM) has been commissioned by Malabar Coal Limited to undertake an Aboriginal cultural heritage assessment for the Maxwell Project located to the east of Denman and south of Muswellbrook, within the Muswellbrook and Singleton local government areas (the 'Area of Interest', Figure 1).

The Maxwell Project would extract coal through underground mining within the Wittingham Coal Measures for a mine life of approximately 26 years. The Maxwell Project would include the development of a mine infrastructure area adjacent to the mine entry. Coal when mined would be transferred to existing coal preparation and train loading infrastructure for processing and dispatch to markets.

The Proponent for the Project is Maxwell Ventures (Management) Pty Ltd, a wholly owned subsidiary of Malabar Coal Limited (Level 26, 259 George Street, Sydney NSW 2000).

You have been identified by the Office of Environment and Heritage (OEH) as an Aboriginal person or organisation with the potential to hold cultural knowledge relevant to determining the significance of Aboriginal objects and places within the area of interest. Accordingly, AECOM is inviting you to participate in community consultation for this project.

To register your interest to be consulted about this project, please contact the following:

Geordie Oakes
c/- AECOM Australia Pty Ltd
PO Box Q410, QVB Post Office,
Sydney, NSW 1230
Ph: +61 2 8934 0610
Fax: +61 2 8934 0001
Email: geordie.oakes@aecom.com

To be involved in the consultation process, registrations must be received by 4 July 2018.

This notification is given in accordance with cl 80C (2)(b) of the *National Parks and Wildlife Regulation 2009* and section 4.1.3 of the Office of Environment and Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW,2010). The purpose of community consultation with Aboriginal people is to assist the proposed applicant in the preparation of an application for an Aboriginal Heritage Impact Permit and to assist the Director General of OEH in his or her consideration and determination of the application.

Please be advised that if you register an interest in consultation, your details will be forwarded to the Office of Environment and Heritage and the Wanaruah Local Aboriginal Land Council, unless you specify that you do not want your details released.

SAMPLE

AECOM Imagine it. Delivered.

Kind regards,



Geordie Oakes
Archaeologist
Geordie.Oakes@aecom.com

Direct Dial: +61 2 8934 0610
Direct Fax: +61 2 8934 0001

SAMPLE

Appendix H

Draft Assessment Methodology

AECOM Imagine it. Delivered.

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

19 July 2018

Dear Stakeholder,

RE: Proposed Aboriginal Cultural Heritage Assessment Methodology for the Maxwell Project

AECOM Australia Pty Ltd (AECOM) is commissioned by Malabar Coal Limited to prepare an Aboriginal Cultural Heritage Assessment (ACHA) for the Maxwell Project, a proposed underground coal mine, located to the east-southeast of Denman and south-southwest of Muswellbrook, within the local government area of Muswellbrook, NSW.

Please find enclosed for your review the proposed assessment methodology for the ACHA being completed for the project. This draft assessment methodology details the proposed approach to the assessment and is being provided to all Registered Aboriginal Parties (RAPs) in accordance with Sections 4.3.1 and 4.3.2 of the NSW Office of Environment and Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010). A brief review of existing environmental and archaeological data for the study area is also provided to give context for the proposed assessment methodology.

Malabar Coal Limited will be holding an ACHA information session at the Maxwell Project site offices (previously the Drayton Mine site office – see Figure 1 below) located on Thomas Mitchell Drive, Muswellbrook, at 10 am on Friday 10 August 2018. 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 below. Please note, attendance at the information session will not be paid.

Aboriginal site officers will be required to assist with site assessment works for this project. If you would like to be considered for site assessment work, please forward a copy of relevant business insurances (i.e., public liability insurance and NSW workers compensation insurance) to Geordie Oakes by COB 10 August 2018 via the contact details provided below.

All comments on the proposed methodology must be received by COB 21 August 2018. Comments can be provided in writing, by phone or at the ACHA information session. 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.

Geordie Oakes
c/- AECOM Australia Pty Ltd
PO Box Q410, QVB Post Office,
Sydney, NSW 1230
Ph: +61 2 8934 0610
Fax: +61 2 8934 0001
Email: geordie.oakes@aecom.com

We look forward to your participation in the assessment of this project.

Yours faithfully

Geordie Oakes
Archaeologist
geordie.oakes@aecom.com

Direct Dial: +64 2 89340610
Direct Fax: +64 2 89340001

Figure 1: Location of Maxwell Administration Building



Maxwell Project: Aboriginal Cultural Heritage Assessment Proposed Methodology

1.0 Introduction

AECOM Australia Pty Ltd (AECOM) is commissioned by Malabar Coal Limited to prepare an Aboriginal Cultural Heritage Assessment (ACHA) for the Maxwell Project, a proposed underground coal mine, located to the east-southeast of Denman and south-southwest of Muswellbrook, within the local government area of Muswellbrook, NSW.

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, Aboriginal community consultation, archaeological field survey and the production of an ACHA report.

In accordance with the Office of Environment and Heritage's (OEH) *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010a), AECOM is providing for your review a proposed (draft) assessment methodology for the Project.

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

2.0 Background to the Current Assessment

The Maxwell Project is located across land previously assessed by AECOM (2012, 2015) for the former Drayton South Coal Project. The former Drayton South Coal Project included the proposed development of a new open cut mine within EL 5460. A comprehensive archaeological survey was undertaken by AECOM for this project over 28 days in 2011 that resulted in the identification of 205 Aboriginal sites including 202 open artefact sites and three stone quarries.

Open cut mining has been prohibited within EL 5460 under the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (Mining SEPP) and the conditions of EL 5460.

In February 2018, Malabar Coal Limited acquired Exploration Licence (EL 5460) and the Drayton Mine assets (now known as the Maxwell Infrastructure).

As part of its acquisition of EL 5460, Malabar committed to develop the Maxwell Project solely as an underground mining operation

3.0 Project Overview

The Maxwell Project would extract coal through underground mining methods within the Wittingham Coal Measures over a period of approximately 26 years.

The Maxwell Project underground mining area would be located entirely within EL 5460 (Figure 1). The Maxwell Project would utilise the existing Maxwell Infrastructure plus require the development of some new infrastructure. Coal when mined would be transferred to existing coal handling, processing and train loading infrastructure at the Maxwell Infrastructure prior to dispatch to markets.

The majority of surface infrastructure required for the Maxwell Project is in place, having been constructed around 30 years ago.

The Project would produce high quality coals with the majority capable of being used for steel-making. The balance would be export thermal coals suitable for the new generation High Efficiency Low Emissions power generators.

The Project would include a number of key components (Section 4, Figure 1), some of which require surface disturbance, including:

1. Mine entry area to access the underground mining areas – approximately 70 hectares (ha).
2. Transport corridor – approximately 80 ha outside of the existing mining disturbance.
3. Potential for re-alignment of Edderton Road – approximately 10 ha.
4. Other works and ancillary infrastructure – up to approximately 10 ha.
5. Subsidence zone – area within the underground mining area and surrounds.

Mine Entry Area

The mine entry area would include infrastructure, services and facilities that would support underground mining and coal handling activities and provide personnel and materials access for the underground mine. The mine entry area would also include ventilation infrastructure.

Transport Corridor

The transport corridor would include:

- an internal access road from the Maxwell Infrastructure; and
- an overland coal conveyor system to transport run-of-mine (ROM) coal from the mine entry area to the existing coal handling and preparation plant (CHPP) at the Maxwell Infrastructure.

The transportation of early ROM coal from the mine entry area to the existing CHPP would also occur via the internal roads within the transport corridor.

Edderton Road Realignment

Edderton Road may require realignment around the underground mining area. The need for this realignment will be informed by consultation with key stakeholders (e.g. Muswellbrook Shire Council) during the EIS process. The potential Edderton Road realignment would intersect the Golden Highway approximately 1km to the west of the current intersection.

Other Works and Ancillary Infrastructure

Other works and ancillary infrastructure would be required outside of the defined surface development areas throughout the life of the Project. These works would include, but not be limited to, environmental and subsidence monitoring activities, remediation of subsidence impacts, exploration, development of service boreholes, site maintenance activities and other minor ancillary works. This surface disturbance would be temporary and isolated in nature. The surface disturbance would occur progressively and these areas would be rehabilitated when no longer required.

Planning Approval Process

Maxwell Ventures (Management) Pty Ltd, a wholly owned subsidiary of Malabar, is seeking consent for the Maxwell Project under the State Significant Development (SSD) provisions of Part 4 of the NSW *Environmental Planning and Assessment Act, 1979* (EP&A Act) and the NSW *Environmental Planning and Assessment Regulation, 2000*. An Environmental Impact Statement will be prepared to accompany the Development Application for the Maxwell Project.

4.0 The Study Area

The study area for this assessment encompasses the proposed underground mining area, inclusive of a potential impact zone buffer, as well as land required for surface infrastructure (Figure 1). Combined, these areas produce a study area of c. 3,200 ha that extends south of the existing Maxwell Infrastructure as a thin transport corridor, expanding to a roughly circular area south of the Saddlers Creek and north of the Hunter River. The majority of land within the study area is currently, and has historically, been used for grazing.

5.0 Archaeological Context

AHIMS Database

Searches of the AHIMS database were undertaken on 11 May 2018 for a 20 x 20 km area surrounding the study area resulting in the identification of 1,620 Aboriginal sites, comprising 1,593 open artefact sites (i.e., isolated artefacts and artefact scatters) (18 of which have associated areas of Potential Archaeological Deposit [PAD]), 15 modified trees (two with associated artefacts), five grinding groove sites, four stone quarries, one area of PAD, one midden and one burial (Table 1).

Consideration of the location of previously recorded Aboriginal sites indicates that 298 are located wholly or partially within the current study area comprising 293 open artefact sites, two modified trees, two stone quarries and one grinding groove site. From these sites, it is noted that the two modified tree sites (AHIMS#37-2-1945 and 37-2-1944) were assessed by Registered Aboriginal Parties (RAPs) and an arborist as not Aboriginal sites as part of the Drayton South Coal Project (AECOM 2012). It is also noted that stone quarry site 'SC-QS-1/Quarry' (AHIMS#37-2-1955) recorded by Mills (2000) within the study area was not located during AECOM's (2012) assessment despite several attempts. Taking into account the above issues, a total of 295 Aboriginal sites are recognised as being located wholly or partially within the study area (Table 2). These include 293 open artefact sites, one stone quarry and one grinding groove site. Of these, 19 sites are located wholly or partially within proposed surface infrastructure areas, all of which are open artefact sites, and 198 sites, comprising 197 open artefact sites and one stone quarry located directly above the proposed underground mining area.

Table 1 Site search results (20 x 20 km area)

Site Type	Count	%
Open artefact site (i.e., isolated artefacts and artefact scatters)	1575	97.2
Open artefact site with PAD	18	1.1
Modified tree	13	0.8
Modified trees + artefact	2	0.1
Grinding groove	5	0.3
Stone quarries	4	0.2
PAD	1	0.1
Midden	1	0.1
Burial	1	0.1
Total	**1620**	**100**

Table 2 Sites within the study area

Site Type	Count	%
Open artefact site (i.e., isolated artefacts and artefact scatters)	293	99.4
Stone quarries	1	0.3
Grinding groove	1	0.3
Total	**295**	**100**

Previous Aboriginal Heritage Assessments

In addition to AECOM's assessments for the Drayton South Coal Project discussed in Section 2.0,

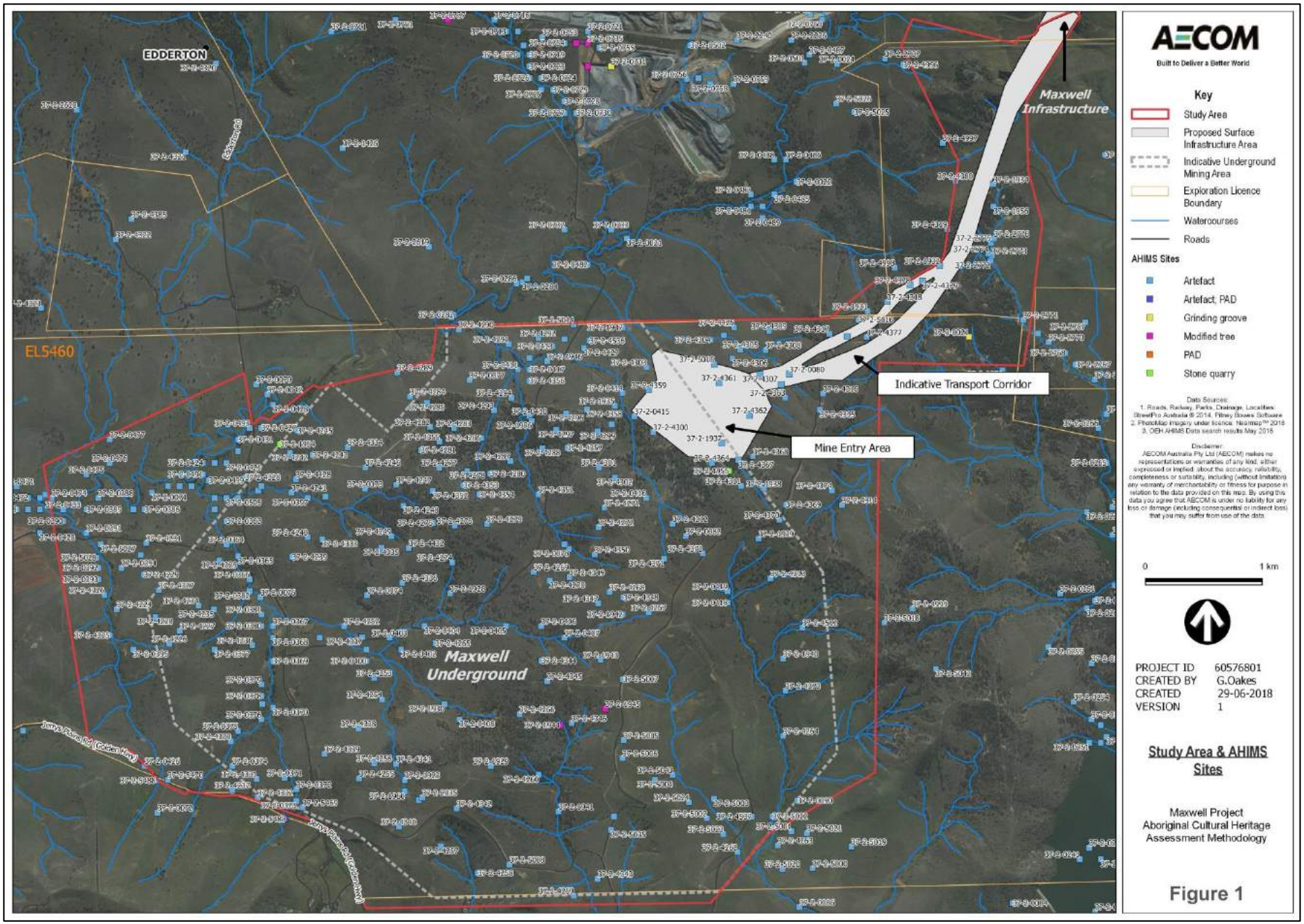
Table 3 provides a summary of previous Aboriginal archaeological assessments that have been carried out within the study area.

Table 3 Previous Aboriginal Heritage Assessments

Consultant	Year	Project / Location	Assessment type	Summary of results
L.K. Dyall	1980	Drayton Coal Lease	Survey	Dyall (1980a) undertook a survey of an area immediately south of the Bayswater Colliery and north of the study area within the Maxwell Infrastructure area. 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	(1985b)	Plashett Dam, Mount Arthur North, and Mount Arthur South	Survey & excavation	Koettig & Hughes (1985) undertook an archaeological survey of three separate development areas in the Hunter Valley. The areas included the Plashett Dam site and water storage area on Saltwater Creek; a coal mine development on Mt Arthur North; and a coal mine development on Mt Arthur South (Drayton South). Within the Plashett Dam 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 Mt 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. 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 Mt 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. Consents to Destroy were granted by the National Parks and Wildlife Service for sites at Plashett Dam and Mt Arthur South. A salvage program of excavation and collection work was carried out and artefacts from eight sites were subsequently collected (MAS12, MAS21, MAS24, MAS39, MAS44, MAS46, MAS47 and MAS48). Artefacts recorded during excavations in all three development areas occurred within the lower portion of the A soil horizon. Indurated mudstone/tuff, silcrete and porcellanite were the most common material in the assemblage. All artefacts were assessed as belonging to Phase I Bondaian.
Mills	2000	Saddlers Creek Mine	Survey	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

Consultant	Year	Project / Location	Assessment type	Summary of results
				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 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 (53.4%) flakes, 41 (17.2%) block fracture fragments, 28 (11.8%) cores, 19 (8%) flake fragments, seven (2.9%) scrapers, five (2.1%) manuports, four (1.7%) hammerstones, three (1.3%) backed blades, one sharpening stone, one millstone, one anvil and one pebble axe. Indurated mudstone/tuff was the dominant material (48.32%), followed by silcrete (31.51%), quartzite (5.46%), chert (5.04%), quartz (2.94%), porcellanite (2.10%), siltstone (2.10%), sandstone (0.84%), basalt (0.84%), fossilised wood (0.42%), and glass (0.42%).
HLA Envirosciences	2002	Drayton Mine Extension	Survey	HLA Envirosciences (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, ridgelines or crests.
Archaeological Risk Assessment Services	2006	Drayton Mine Extension	Survey	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 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% 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%).
Archaeological Risk Assessment Services	2010	Drayton Mine Extension	Survey and salvage	ARAS (2010) undertook a program of salvage excavation for 26 Aboriginal sites for the Drayton Mine Extension Project. 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 8505 artefacts were recovered as part of the works. Of these, 7500 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 ka 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 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 sites associated with Ramrod Creek were specific to stone tool manufacturing activities, with particular emphasis on producing Bondi points from porcellanite.

Figure 2 Study area and AHIMS sites



AECOM Imagine it. Delivered.

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

6.0 Methodology

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

1. Background research;
2. Archaeological survey of those areas within the study area not previously surveyed (i.e., as presented in AECOM [2012, 2015]) and potentially impacted by the project;
3. Consultation with RAPs in order to identify the Aboriginal cultural heritage values of the study area; and
4. Preparation of an ACHA for the study area detailing the results of the above. Appropriate management/mitigation measures for the identified Aboriginal heritage values of the study area will be provided in this report.

The proposed methodologies for each of these components are detailed in the sections below.

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.

A. Background Research

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

- Updated searches of OEH'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.

B. Archaeological Survey

AECOM proposes to utilise the survey results from AECOM (2012, 2015) and only undertake survey within those portions of the Maxwell Project study area not previously surveyed (gap areas). In addition, archaeological survey will only be undertaken in those areas potentially subjected to direct and indirect project related impacts. As such, archaeological survey may not be required for the entire study area. The requirement for archaeological survey will be assessed on an ongoing basis as mine plans progress.

Survey will be undertaken by a combined field team of two AECOM archaeologists and appropriate number of RAP field representatives, as determined by AECOM and Malabar Coal Limited 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 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 OEH's AHIMS database.

Modifications to the study area may occur during the preparation of the ACHA as detailed mine planning progresses. In addition, modifications to the proposed methodology may occur in response to survey results, feedback from RAPs or other unanticipated events.

C. 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:

- A request (with this draft methodology) for any initial comments regarding the Aboriginal cultural heritage values of the study area;
- The provision of this information package, including draft assessment methodology to all RAPs for comment prior to fieldwork;
- RAP participation in field survey;
- Discussion of cultural heritage values with RAPs during field survey and generally throughout the process until the end of the draft ACHA review period; and
- Provision of 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 OEH'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 Project will be assessed as an SSD [Section 3]), and to assist the "*Director-General*" (DECCW, 2010) in his or her consideration and determination of the application.

D. Preparation of an ACHA

AECOM will prepare an ACHA for the Project detailing the results of the above archaeological survey and consultation with RAPs. The ACHA will provide appropriate management and mitigation measures for the study area's Aboriginal heritage values. RAPs will have the opportunity to comment on management and mitigation options proposed in the ACHA prior to finalisation.

Archaeological Test Excavation

It is noted that none of the Aboriginal sites selected for archaeological test excavation as part of the Drayton South Project are located within the Maxwell Project surface disturbance areas. As such, archaeological test excavation is not currently proposed as part of the ACHA. However, should Aboriginal sites be identified within gap areas during the assessment and it be determined that test excavation is required to better understand the nature, extent and significance of these sites, then it would be considered as part of the ACHA. Should archaeological salvage be required, this would be

recommended to be undertaken post-approval with details included in an Aboriginal Cultural Heritage Management Plan (ACHMP) prepared for the project.

7.0 Project 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.
- Meeting with RAPs to present information about the Maxwell Project and discuss this draft methodology – 10 August 2018.
- Provision of comment on this draft methodology – 21 August 2018.
- Field surveys – late August/early September 2018.
- Provision of a draft ACHA report to each RAP for review and comment – anticipated to occur in late 2018.
- 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 – anticipated to occur in early 2019.

The above timelines are preliminary only and are subject to change. RAPs will be notified of dates for field surveys and the due date for provision of comments on the draft ACHA report once available.

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.

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

Oakes, Geordie

From:	Scott Franks <scott@tocomwall.com.au>
Sent:	Tuesday, 21 August 2018 3:18 PM
To:	Oakes, Geordie
Cc:	Donna McLaughlin; Sharon Molloy; eddie.love@industry.nsw.gov.au
Subject:	Maxwell project
Attachments:	Maxwell1.pdf
Importance:	High

Dear Geordie,

- Proposed methodology for Maxwell Project Rejected by Registered Native title party Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People

Further to the response from the registered Native title party the PCWP, I have further reviewed the attached Methodology for the project and confirm that we do not except the Methodology for the proposed assessment. This document attempt to heighten the need to comply with the current CCGL 2010 but clearly leaves out significant section of the same document. It appears to draw on a conclusion but exclude requirement under the CCGL 2010, further to this the current position with the registration of interest is at a stage where the company has not even vetted the registered interested parties under the consultation guild lines, with regard to the below the only party that meets this section is; (see Below) the below grounds are why we do not support the proposed methodology for the Maxwell project, we also request that you contact OEH today and advise them that we do not support the methodology.

The Methodology in known way considers the below section, the methodology also has not recorded or appears to not even consider the Assessment conducted and completed by.

- Peter Kuskie south east Archaeology.
- Planning Assessment commission ruling.
- Upper hunter breeders / Tocomwall response to the Pac.(GML)

I would also like to advise that the mine itself have also advised me that the current MLA's for Spur Hill are being withdrawn based on the map provided with your document page 3 provides a map for the survey that covers the right to negotiate issues for section 29 Spur Hill, I now believe that the survey could not be conducted as with the MLA's being withdrew there is no approval in place that requires a survey of our heritage for possible destruction.

- Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People
- http://www.nntt.gov.au/searchRegApps/NativeTitleRegisters/Pages/RNTC_details.aspx?NNTT_Fileno=NC2013/006

Section 3

3.3.1 Who can provide this information?

Aboriginal people who can provide the information outlined in 3.3 above are, based on Aboriginal lore and custom, the traditional owners or custodians of the land that is the subject of the proposed project. Traditional owners or custodians with appropriate cultural heritage knowledge to inform decision making who seek to register their interest as an Aboriginal party are those people who:

- · continue to maintain a deep respect for their ancestral belief system, traditional lore and custom
- · recognise their responsibilities and obligations to protect and conserve their culture and heritage and care for their traditional lands or Country
- · have the trust of their community, knowledge and understanding of their culture, and permission to speak about it.

  In some cases, the information required for decision making will be held by Aboriginal people with statutory recognition for certain lands:

  - · Aboriginal owners in accordance with the NSW ALR Act and/or
  - · Native title holders or registered native title claimants in accordance with the *Native Title Act 1993* (Cth) and NSW *Native Title Act 1994*

    It is acknowledged that Aboriginal people who, through a historical presence in a particular area, may have developed cultural knowledge relevant to the Aboriginal objects and/or places based on knowledge passed down to them by Aboriginal people with a traditional connection to Country. DECCW respects the rights of Aboriginal people with a historical connection to Country to, with their permission, act on behalf of Aboriginal people with a traditional connection to Country. DECCW acknowledges that in some cases it will only be Aboriginal people with a historical connection to an area who have the knowledge to inform the assessment of cultural significance of certain objects/places; e.g. on Aboriginal reserves and missions.

All correspondence received at our end suggest that the RAPS have been taken on face value and know attempt to comply with section 3 of the CCGL 2010 has been considered let alone section 90k. the groups that have registered an interest are not authorised to make comments, recommendations or support the destruction of any area with in the Registered Native title area of the PCWP. I would also like to confirm that Tocomwall and the PCWP do not support the methodology provided to us and the Raps at know stage has the company attempted to address our concerns, As advised in the consultation guild lines if Raps have differing views on a methodology a independent mediation process must be sort.

The registered Native title party are known requesting mediation for this project and we seek OEH's intervention to seek a stop work agreement on the current proposed field survey until a mediated out comes has been reached.

Section Q5 facts sheet attached to CCGL 2010.

What happens when the views of registered Aboriginal parties differ markedly? That is, some may support a proposed development and AHIP application while others may oppose it. How do conflicts of views get resolved?

The proponent is required to record all feedback received, along with the proponent's response to the feedback. The proponent should make reasonable attempts to resolve conflicts; however, DECCW acknowledges that, in some cases, this may not be achievable.

In the case where conflict cannot be resolved, it is the responsibility of the proponent to record these differences and provide the necessary information in their Aboriginal cultural heritage assessment report with their AHIP application to support decision making.

Conflict resolution is a component of consultation – DECCW recommends that proponents engage someone who is skilled and experienced in consultation with Aboriginal people.

Cced,

- OEH
- Department of industry

Regards
Scott Franks

Native Title & Environmental Services Consultant

Tocomwall Pty Ltd
PO Box 76
CARINGBAH NSW 1495
m: 0404 171544
p: 02 9542 7714
f: 02 9524 4146
e: scott@tocomwall.com.au
www.tocomwall.com.au

The information contained in this e-mail message and any attached files may be confidential and may contain copyright material of Tocomwall Pty Ltd or third parties. Any unauthorised use, disclosure or copying of this e-mail and/or its attachments is prohibited. If you have received this e-mail in error, please notify the sender immediately by return e-mail and delete all copies of the message and attachments. Before opening or using attachments, please check them for viruses or defects. Our liability is limited to resupplying the e-mail and attached files. Content and views expressed in this e-mail may be those of the sender, and are not necessarily endorsed by Tocomwall Pty Ltd.

Oakes, Geordie

From: Scott Franks <scott@tocomwall.com.au>
Sent: Wednesday, 25 July 2018 12:48 PM
To: Oakes, Geordie
Cc: Donna McLaughlin
Subject: <no subject>
Attachments: Surhillmalanbar.pdf

Importance: High

Geordie,

Thank you for the attached document regarding the Maxwell Project, I would like to advise this mining lease currently have an outstanding Section 29 RTN with the registered Native title party, and as such the registered Native title party cannot support the proposed methodology you have applied to use for the project. The attempt to engage with registered Aboriginal parties and then simply except those people as being Traditional knowledge holders for that area is in oppositions to the current CCGL 2010. One element of your document fails to address section 3 and also page 5 of the (following link for your information)

Page 5 of OEH 2010 Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW contains the reference that you referred to. Document is available at:
http://www.environment.nsw.gov.au/resources/cultureheritage/20110263ACHguide.pdf

Skills to investigate and assess Aboriginal cultural heritage

The investigation and assessment of Aboriginal cultural heritage should make use of all relevant disciplines. The assessment of cultural significance is more than a component of an archaeological assessment or investigation. It cannot be assumed that any one practitioner will have the full range of skills required to investigate and assess cultural significance and harm. During this task it may be necessary to engage additional practitioners with special expertise.

I would also like to point out the Registered Native title have made it quite clear in our registration of interest for this project that we do not and have never gave permission or authorised any Registered Aboriginals party to speak for or on the behalf of our native title claimed area or interpret the importance of our heritage. As you are aware this registered Claim group conduct our own cultural heritage assessment for the purpose of assessing our lands for the possible approval of developments with the claimed area.

I have also noticed that your review has left out the heritage assessment managed by resource strategies and south east archaeology.

Regards
Scott Franks

Native Title & Environmental Services Consultant

Tocomwall Pty Ltd
PO Box 76
CARINGBAH NSW 1495

m: 0404 171544
p: 02 9542 7714
f: 02 9524 4146
e: scott@tocomwall.com.au
www.tocomwall.com.au



The information contained in this e-mail message and any attached files may be confidential and may contain copyright material of Tocomwall Pty Ltd or third parties. Any unauthorised use, disclosure or copying of this e-mail and/or its attachments is prohibited. If you have received this e-mail in error, please notify the sender immediately by return e-mail and delete all copies of the message and attachments. Before opening or using attachments, please check them for viruses or defects. Our liability is limited to resupplying the e-mail and attached files. Content and views expressed in this e-mail may be those of the sender, and are not necessarily endorsed by Tocomwall Pty Ltd.

Oakes, Geordie

From:	maree waugh <mareewaugh30@hotmail.com>
Sent:	Sunday, 29 July 2018 9:05 PM
To:	Oakes, Geordie
Subject:	INSURANCES
Attachments:	241510-060418 Business Insurances.pdf

Hi Geordie,

Im happy with the methodology
Please find attached insurances.

Maree Waugh

Virus-free. www.avg.com

Oakes, Geordie

From:	WIDESCOPE . <widescope.group@live.com>
Sent:	Wednesday, 8 August 2018 9:29 AM
To:	Oakes, Geordie
Subject:	FW: Proposed Aboriginal cultural heritage assessment mythology for Maxwell project
Attachments:	Steven Hickey.pdf; 20180807_141127.jpg

Subject: Proposed Aboriginal cultural heritage assessment mythology for Maxwell project

Hi Georgie

I have reviewed and support the project methodology.

Sorry I will not be able to attend the information session on the 10th.

I would like to be considered for the site assessment works I have supplied relevant insurances as requested
Thank you Steven Hickey

Wonn1
Entity of Kauwul Pty Ltd

619 Main Road Glendale, 2285

PHONE: 0249547751 Mobile: 0402146193

ABN: 27 153 953 363

16 August 2018

Mr G Oakes
C/- AECOM Australia Pty Ltd
PO Box Q410
SYDNEY NSW 1230
Email: geordie.oakes@aecom.com

Dear Geordie

RE: PROPOSED ABORIGINAL CULTURAL HERITAGE ASSESSMENT METHODOLOGY FOR THE MAXWELL PROJECT – MALABAR COAL LIMITED

Thank you for your letter dated 19 July 2018 inviting us to comment on the proposed Aboriginal Cultural Heritage Assessment Methodology for the above project.

We have reviewed the documentation and agree with the methodologies and would like to thank you once again for this opportunity to be consulted and to participate in this project. We look forward to hearing from you soon.

As required in your letter, we are forwarding once again our certificates of insurance currency as required.

Kind regards

Suzie Worth
For Arthur C Fletcher
Wonn1 (Kauwul Pty Ltd)

Attached.

Oakes, Geordie

From: cacatua4service@tpg.com.au
Sent: Friday, 27 July 2018 9:54 AM
To: Oakes, Geordie
Subject: Maxwell project AGA & Cacatua

Geordie,

Thank you for the information with regards to Maxwell Project that was forwarded to AGA Services and Cacatua General Services dated 19th July 2018.

AGA Services and Cacatua had a meeting this morning and the Maxwell Project was on the agenda.

Both AGA Services and Cacatua discussed the methodology and all staff are in support of the supplied methodology.

Both AGA Services and Cacatua would like to be involved the assessment work and I will forward the required information in a following email.

Staff agree 8
Staff disagree 0

If you require any more information please call Donna on 0403765019

Thank you
Donna Sampson

Appendix I

RAP Responses to Draft Report

Oakes, Geordie

From: Scott Franks <scott@tocomwall.com.au>
Sent: Sunday, 18 November 2018 3:01 PM
To: Oakes, Geordie
Cc: Steven Cox ; Megan Dawson
Subject: Re: Maxwell Project Aboriginal Cultural Heritage Assessment Report (ACHAR)

Importance: High

Dear Geordie,

Thank you for the Maxwell Project Aboriginal Cultural Heritage Assessment Report (ACHAR). Tocomwall and the PCWP registered native title claimant group rejects the ACHAR. After a quick review of the document it appears that you or the proponent has not considered the finding against this mining lease before it was purchased by Maxwell. The PAC rejected the original heritage assessment conducted by AECOM and supported the confidential assessment conducted by Tocomwall and the upper hunters breeders association. As this document is controlled by The upper hunters Breeders association and Tocomwall, I will not be making that available to AECOM or your proponent.

As the reregistered Native title claimant for the Scott Franks and anor, I request a meeting with Department of planning and OEH to discuss our concern with this project going ahead.

Regards
Scott Franks

Native Title & Environmental Services Consultant

Tocomwall Pty Ltd
PO Box 76
CARINGBAH NSW 1495
m: 0404 171544
p: 02 9542 7714
f: 02 9524 4146
e: scott@tocomwall.com.au
www.tocomwall.com.au

The information contained in this e-mail message and any attached files may be confidential and may contain copyright material of Tocomwall Pty Ltd or third parties. Any unauthorised use, disclosure or copying of this e-mail and/or its attachments is prohibited. If you have received this e-mail in error, please notify the sender immediately by return e-mail and delete all copies of the message and attachments. Before opening or using attachments, please check them for viruses or defects. Our liability is limited to resupplying the e-mail and attached files. Content and views expressed in this e-mail may be those of the sender, and are not necessarily endorsed by Tocomwall Pty Ltd.

AECOM Imagine it. Delivered.

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

21 December 2018

Mr Scott Franks
Native Title & Environmental Services Consultant
Tocomwall Pty Ltd
Caringbah NSW 2495

BY EMAIL: scott@tocomwall.com.au

Dear Mr Franks,

Maxwell Project – Comments from Tocomwall In Relation to Draft Aboriginal Cultural Heritage Assessment Report

Thank you for your email of 18 November 2018, to which I refer.

I would like to note that as the author of the Aboriginal cultural heritage assessment for the Drayton South Project, I am aware that a confidential submission was made by Tocomwall regarding Aboriginal cultural heritage matters for that project. As part of the gathering of cultural values information for the Maxwell Project, I would like to request that should you have any cultural values you would like included in the Maxwell Project ACHAR, including those contained within the confidential submission, that you please provide those by mail, fax or email for inclusion in the assessment.

I note that you indicated, in your email of 18 November 2018, that you had undertaken a "quick review" of the draft Aboriginal cultural heritage assessment report. It would be appreciated if you could please conduct a full review of the draft report and, if you still remain of the view that the draft report is inadequate in addressing the substance of the confidential report, I would invite you to either:

(a) meet with me for the purpose of you explaining to me how you suggest the concerns raised by the confidential report are best addressed; or

(b) provide me with written correspondence which explains to me how you consider the concerns raised by the confidential report are best addressed.

I would appreciate your response in this regard by no later than 18 January 2019.

The proponent of the Maxwell Project, Malabar Coal, has indicated to me that they are prepared to cooperate with you to address the concerns raised in the confidential report.

I also note that you made reference to conclusions by the Drayton South PAC in relation to the previous assessment report. I have included the conclusions of the relevant PAC reports in an enclosure to this letter for your reference.

I look forward to hearing from you soon.

Yours faithfully



Geordie Oakes
Senior Heritage Specialist
geordie.oakes@aecom.com
Direct Dial: +64 2 89340610
Direct Fax: +64 2 89340001

ENCLOSURE 1 – REVIEW OF PREVIOUS PAC REPORTS

Drayton South Coal Project – PAC Review Report (dated December 2013) (First PAC Review Report)

In the First PAC Review Report, the issue of Aboriginal cultural heritage was not discussed in any detail. Rather, on p 22 of the First PAC Review Report, it was stated:

> Other impacts
>
> Other impacts of the proposed mine have not been discussed in this report as they were not considered critical to the assessment of the impact on the horse studs. Nonetheless these would need to be considered prior to any determination and include Aboriginal cultural heritage, climate change and traffic impacts.

Drayton South Coal Project – PAC Determination Report (dated 17 October 2014) (First PAC Determination Report)

In the First PAC Determination Report, the issue of Aboriginal cultural heritage was not expressly discussed in it. There, was, however, reference to heritage generally, which may be construed as including Aboriginal cultural heritage, in the following paragraph on p 3 of the First PAC Determination Report:

> Other potential impacts such as biodiversity, heritage, water, economic and social, are unlikely to be significant and can be suitably mitigated and/or offset.

Drayton South Open Cut Coal Project – PAC Review Report (dated November 2015) (Second PAC Review Report)

In the Second PAC Review Report, the PAC identified that the proponent's Aboriginal cultural heritage assessment had considered tangible Aboriginal artefacts, but comparatively limited attention had been given to "the wider, less tangible, cultural landscape and context provided by the Aboriginal cultural heritage values associated with the area" (p 59 of the Second PAC Review Report). The PAC recommended that further Aboriginal cultural heritage assessment work be undertaken in connection with the proposed project, but did not "reject" the Aboriginal cultural heritage assessment report that had been undertaken.

Drayton South Open Cut Coal Project – PAC Determination Report (dated 22 February 2017) (Second PAC Determination Report)

In the Second PAC Determination Report, the PAC expressly addressed a confidential submission. On p 22 of the Second PAC Determination Report, it is relevantly stated:

> The Commission received submissions, including a confidential report, raising concerns with the assessment of indigenous cultural heritage issues within the Project site …
>
> Furthermore, the confidential report noted that the Applicant's Indigenous cultural heritage report did not consider the value of, or impacts to, 25 of the 27 cultural heritage aspects that were identified in the confidential report. The key finding of the confidential report was that the Applicant's report does not represent an accurate, comprehensive and adequate assessment of indigenous heritage values, or assessment of the heritage impact to those values.
>
> The Commission acknowledges that the Project could result in impacts on indigenous cultural heritage. However, the Commission, on review of the information submitted by the Applicant, OEH and in submissions, is satisfied that the Applicant has adequately addressed the concerns raised, noting that the approach to excavations proposed is consistent with that advocated by OEH and with the guidelines relevant to indigenous heritage assessment.
>
> On this basis, the Commission finds that the Project would, subject to the mitigation measures proposed by the Applicant and the conditions recommended by the Department, have an acceptable impact on indigenous cultural heritage

Oakes, Geordie

From: Scott Franks <scott@tocomwall.com.au>
Sent: Friday, 21 December 2018 2:04 PM
To: Oakes, Geordie
Subject: Re: Maxwell Project Aboriginal Cultural Heritage Assessment Report (ACHAR)

Importance: High

Dear Geordie,

Thank you for the phone call and the follow up issue regarding the Maxwell mining operation. As I have explained in the past Tocomwall with a licence and consent of the registered Native title party PCWP do not except or give permission to Registered Aboriginals party's assessing or making comment on the cultural values with in the registered native title clamed area. As you would be aware in September 2018 Tocomwall lodged several sites cards with AHMIS one of which covers the Maxwell mining operation's ELA, the company in question is very familiar with the registered native title part as per a section 29 notice that was attached to the previous approval before the MLA was withdrawn.

As the company has been involved in a section 29 notification under native title it is ridiculous for this company to now try and refuse to except who and which group is a traditional knowledge holder as described in the 2010 CCGL for proponents. To allow people to asses our country and to make decisions on our cultural lore and customs is appalling. This being said with regard to the sites card for that location and the confidential assessment conducted by Tocomwall and the upper hunters breeders association. As this document is controlled by The upper hunters Breeders association, Tocomwall will be using this information direct with OEH and the federal Government to lodge a section 9 and section 10 applications under the Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Cth) (the ATSIHP Act). Tocomwall would further like to state that this company has known issue with the work AECOM are conduction but we take exception to the way Maxwell are side stepping issues we have raised with you and OEH.

Regards
Scott Franks

Native Title & Environmental Services Consultant

Tocomwall Pty Ltd
PO Box 76
CARINGBAH NSW 1495
m: 0404 171544
p: 02 9542 7714
f: 02 9524 4146
e: scott@tocomwall.com.au
www.tocomwall.com.au

Oakes, Geordie

From: Aliera French Trading <aliera.french.trading@hotmail.com>
Sent: Thursday, 24 January 2019 5:58 PM
To: Oakes, Geordie
Subject: Re: Maxwell Project Aboriginal Cultural Heritage Assessment Report (ACHAR)

Hi Geordie,

How are you going?

Sorry for the late reply. I just had a read through and I am happy with the report so please go ahead. I have no added inclusions.

Kind regards,
Aliera French.

From: Oakes, Geordie <Geordie.Oakes@aecom.com>
Sent: Wednesday, 19 December 2018 12:36 PM
To: Aliera.french.trading@hotmail.com
Subject: FW: Maxwell Project Aboriginal Cultural Heritage Assessment Report (ACHAR)

Hi Aliera,

Just following up on comment for the Maxwell Project. Did you have any comments on the draft report or cultural values you would like me to include?

Thanks,
Geordie

Geordie Oakes
Senior Heritage Specialist
D +61 2 8934 0610
Geordie.Oakes@aecom.com

AECOM
Level 21, 420 George Street, Sydney, NSW 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000 F +61 2 8934 0001
aecom.com

Imagine it. Delivered.

LinkedIn Twitter Facebook Instagram

Oakes, Geordie

From: Amanda Hickey <amandahickey@live.com.au>
Sent: Thursday, 20 December 2018 8:07 PM
To: Oakes, Geordie
Subject: Re: Maxwell Project Aboriginal Cultural Heritage Assessment Report (ACHAR)

Hi Geordie

Thank you for your email
AHCS is happy with the draft report.

Thank you
Amanda Hickey AHCS

Get Outlook for Android

From: Oakes, Geordie <Geordie.Oakes@aecom.com>
Sent: Wednesday, December 19, 2018 2:33:02 PM
To: Amanda Hickey (amandahickey@live.com.au)
Subject: FW: Maxwell Project Aboriginal Cultural Heritage Assessment Report (ACHAR)

Hi Amanda,

Just following up on comment for the Maxwell Project. Did you have any comments on the draft report or cultural values you would like me to include?

Thanks,
Geordie

Geordie Oakes
Senior Heritage Specialist
D +61 2 8934 0610
Geordie.Oakes@aecom.com

AECOM
Level 21, 420 George Street, Sydney, NSW 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000 F +61 2 8934 0001
aecom.com

Imagine it. Delivered.

LinkedIn Twitter Facebook Instagram

Oakes, Geordie

From: cacatua4service@tpg.com.au
Sent: Thursday, 20 December 2018 5:21 PM
To: Oakes, Geordie
Subject: Re: FW: Maxwell Project Aboriginal Cultural Heritage Assessment Report (ACHAR)

Geordie,

Sorry for the delay, Cacatua and AGA Services had our last meeting for the year this morning via phone link up, In our meeting we tabled the information that was supplied with regards to Maxwell Project.

Both AGA Services and Cacatua agree and support the Aboriginal Cultural Heritage Assessment Report that was supplied.

Thank you
George

----- Original Message -----
From:
"Oakes Geordie" <Geordie.Oakes@aecom.com>

To:
"cacatua4service@tpg.com.au" <cacatua4service@tpg.com.au>
Cc:

Sent:
Wed, 19 Dec 2018 03:53:45 +0000
Subject:
FW: Maxwell Project Aboriginal Cultural Heritage Assessment Report (ACHAR)

Hi George,

Just following up on comment for the Maxwell Project. Did you have any comments on the draft report or cultural values you would like me to include?

Thanks,

Geordie

Geordie Oakes
Senior Heritage Specialist
D +61 2 8934 0610
Geordie.Oakes@aecom.com

AECOM
Level 21, 420 George Street, Sydney, NSW 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000 F +61 2 8934 0001

Oakes, Geordie

From: Tracey Skene <tracey@marrung-pa.com.au>
Sent: Wednesday, 19 December 2018 4:52 PM
To: Oakes, Geordie
Subject: Re: FW: Maxwell Project Aboriginal Cultural Heritage Assessment Report (ACHAR)

Good Afternoon Geordie,

Culturally Aware has viewed your Report and happy with the mitigation methods and proposed recommendation for each site of the area.

Further consultation with the Aboriginal community and being kept up to date with these recommendations to where they are up to with permits , community input and involvement.

As for the Plan of management the Aboriginal Community should assist with this so that Heritage management plan can be developed according to the individual requirements of particular sites of the Cultural landscape(Flats, Mid Slopes, crest, and in particular the water courses) as some areas may already show signs of natural erosion etc, so mitigation methods should be a separate process depending on the extent of erosion/Cracking of each site therefore monitoring and stabilisation of areas should be taken into account to stop the site being lost from Natural impacts or possible cracking .

All relevant stakeholders should be involved in the formulation and execution of management plans to preserve and protect a site from damage while having as little impact to the integrity of the site as possible and trying to maintain its natural surrounds as they are (e.g Water flows) that are integral to the significance of the place.

The cultural landscape is of high importance to the Aboriginal people, it's a part of our cultural connection especially a majority of this Landscape as it tells a cultural story to us, and shows how all the sensitive cultural landscape surrounding this area all merge together to to be part of a bigger picture .

Looking forward to future consultation on this Assessment.

Thanks
Tracey Skene
Culturally Aware

Kind regards
Tracey Skene
7 Crawford Place,Millfield NSW 2325

Oakes, Geordie

From: lilly carroll <didgengunawalclan@yahoo.com.au>
Sent: Wednesday, 19 December 2018 12:23 PM
To: Oakes, Geordie
Subject: Re: Maxwell Project Aboriginal Cultural Heritage Assessment Report (ACHAR)

We are happy to go ahead with everything Thankyou Geordie, Merry Xmas and Happy New Year

Sent from Yahoo Mail for iPhone

On Wednesday, December 19, 2018, 12:20 pm, Oakes, Geordie <Geordie.Oakes@aecom.com> wrote:

> Hi Paul,
>
> Did you have any comments on the draft report you would like me to include?
>
> Thanks,
>
> Geordie

Geordie Oakes
Senior Heritage Specialist
D +61 2 8934 0610
Geordie.Oakes@aecom.com

AECOM
Level 21, 420 George Street, Sydney, NSW 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000 F +61 2 8934 0001
aecom.com

Imagine it. Delivered.

LinkedIn Twitter Facebook Instagram

.

Oakes, Geordie

From: Gidawaa Walang Cultural Heritage Consultancy <gidawaa.walang@hotmail.com>
Sent: Wednesday, 28 November 2018 3:46 PM
To: Oakes, Geordie
Subject: Re: Maxwell Project Aboriginal Cultural Heritage Assessment Report (ACHAR)

Hi Geordie,

Just read the Draft ACHA and I have no comments to add.
Thanks.
Regards,
Craig

Gidawaa Walang Cultural Heritage Consultancy
trading name of Barkuma Neighbourhood Centre Inc.
76 Lang Street, Kurri Kurri 2327 I Phone: 02 4937 1094
www.barkuma.org I Fax: 02 4936 4449

From: Oakes, Geordie <Geordie.Oakes@aecom.com>
Sent: Sunday, 18 November 2018 2:05 PM
To: Oakes, Geordie
Subject: Maxwell Project Aboriginal Cultural Heritage Assessment Report (ACHAR)

Dear RAP,

In accordance with Section 4.4.2 of OEH's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010), please find attached for your review a draft of AECOM's Aboriginal Cultural Heritage Assessment Report (ACHAR) as well as an associated information letter for the Maxwell Project, a proposed underground coal mine, located to the east-southeast of Denman and south-southwest of Muswellbrook, within the local government area of Muswellbrook, NSW.

Should you have any cultural values or comments you would like included in the ACHAR please provide those by mail, fax, e-mail or phone to Geordie Oakes via the contact details on this email. Please note that the closing date for comments is Tuesday 18 December 2018.

If you would like a hard copy (paper version) of the assessment report, please let me know.

All the best,
Geordie

Geordie Oakes
Senior Heritage Specialist
D +61 2 8934 0610
Geordie.Oakes@aecom.com

AECOM
Level 21, 420 George Street, Sydney, NSW 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000 F +61 2 8934 0001
aecom.com

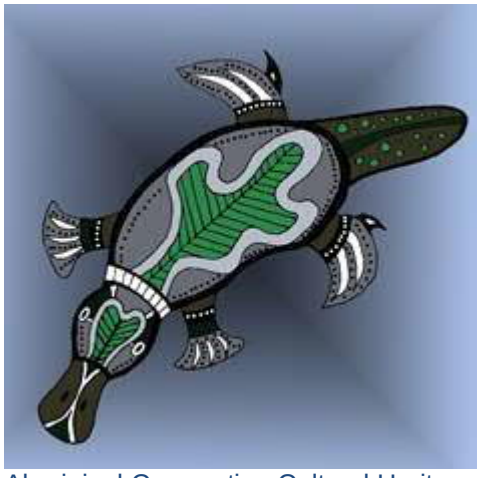
Imagine it. Delivered.

Oakes, Geordie

From: Ryan Johnson <murrabidgeemullangari@yahoo.com.au>
Sent: Monday, 26 November 2018 5:32 PM
To: Oakes, Geordie
Subject: RE: Maxwell Project Aboriginal Cultural Heritage Assessment Report (ACHAR)

Hi Geordie,
I have read the ACHAR for the above project and endorse the recommendations made by AECOM, please feel free to contact me if you require further details.
Thanks

Ryan Johnson | **Murra Bidgee Mullangari**
0475565517



Aboriginal Corporation Cultural Heritage

A: PO Box 246, Seven Hills, NSW, 2147
E: murrabidgeemullangari@yahoo.com.au
ICN: 8112

Note: Privileged/Confidential information may be contained in this message and may be subject to legal privilege. Access to this e-mail by anyone other than the intended is unauthorised. If you are not the intended recipient (or responsible for delivery of the message to such person), you may not use, copy, distribute or deliver to anyone this message (or any part of its contents) or take any action in reliance on it. In such case, you should destroy this message, and notify us immediately. If you have received this email in error, please notify us immediately by e-mail or telephone and delete the e-mail from any computer. If you or your employer does not consent to internet e-mail messages of this kind, please notify us immediately. All reasonable precautions have been taken to ensure no viruses are present in this e-mail. As our company cannot accept responsibility for any loss or damage arising from the use of this e-mail or attachments we recommend that you subject these to your virus checking procedures prior to use. The views, opinions, conclusions and other informations expressed in this electronic mail are not given or endorsed by the company unless otherwise indicated by an authorized representative independent of this message.

From: Oakes, Geordie [mailto:Geordie.Oakes@aecom.com]
Sent: Sunday, 18 November 2018 2:06 PM
To: Oakes, Geordie <Geordie.Oakes@aecom.com>
Subject: Maxwell Project Aboriginal Cultural Heritage Assessment Report (ACHAR)

Dear RAP,

Oakes, Geordie

From: Phillip Boney <waarlan12@outlook.com>
Sent: Thursday, 27 December 2018 12:43 PM
To: Oakes, Geordie
Subject: Re: Maxwell Project Aboriginal Cultural Heritage Assessment Report (ACHAR)

no Geordie not at this stage mate

Get Outlook for Android

From: Oakes, Geordie <Geordie.Oakes@aecom.com>
Sent: Wednesday, December 19, 2018 12:32:32 PM
To: waarlan12@outlook.com
Subject: FW: Maxwell Project Aboriginal Cultural Heritage Assessment Report (ACHAR)

Hi Phil,

Just following up on comment for the Maxwell Project. Did you have any comments on the draft report or cultural values you would like me to include?

Thanks,
Geordie

Geordie Oakes
Senior Heritage Specialist
D +61 2 8934 0610
Geordie.Oakes@aecom.com

AECOM
Level 21, 420 George Street, Sydney, NSW 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000 F +61 2 8934 0001
aecom.com

Imagine it. Delivered.

LinkedIn Twitter Facebook Instagram



Oakes, Geordie

From: Rhonda Ward <wedgetail59@outlook.com>
Sent: Wednesday, 19 December 2018 12:45 PM
To: Oakes, Geordie
Subject: Re: Maxwell Project Aboriginal Cultural Heritage Assessment Report (ACHAR)

Hi no I don't, but I would like to be involved in all the decision and all work with the project, thanks Rhonda

Get Outlook for Android

From: Oakes, Geordie <Geordie.Oakes@aecom.com>
Sent: Wednesday, December 19, 2018 12:29:48 PM
To: Rhonda Ward (wedgetail59@outlook.com)
Subject: FW: Maxwell Project Aboriginal Cultural Heritage Assessment Report (ACHAR)

Hi Rhonda,

Did you have any comments on the draft report or cultural values you would like me to include?

Thanks,
Geordie

Geordie Oakes
Senior Heritage Specialist
D +61 2 8934 0610
Geordie.Oakes@aecom.com

AECOM
Level 21, 420 George Street, Sydney, NSW 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000 F +61 2 8934 0001
aecom.com

Imagine it. Delivered.

LinkedIn Twitter Facebook Instagram



From: Oakes, Geordie
Sent: Sunday, 18 November 2018 2:06 PM
To: Oakes, Geordie
Subject: Maxwell Project Aboriginal Cultural Heritage Assessment Report (ACHAR)

Dear RAP,

In accordance with Section 4.4.2 of OEH's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010), please find attached for your review a draft of AECOM's Aboriginal Cultural Heritage Assessment Report (ACHAR) as well as an associated information letter for the Maxwell Project, a proposed underground coal mine, located to the east-southeast of Denman and south-southwest of Muswellbrook, within the local government area of Muswellbrook, NSW.

Should you have any cultural values or comments you would like included in the ACHAR please provide those by mail, fax, e-mail or phone to Geordie Oakes via the contact details on this email. Please note that the closing date for comments is Tuesday 18 December 2018.

If you would like a hard copy (paper version) of the assessment report, please let me know.

All the best,
Geordie

Geordie Oakes
Senior Heritage Specialist
D +61 2 8934 0610
Geordie.Oakes@aecom.com

AECOM
Level 21, 420 George Street, Sydney, NSW 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000 F +61 2 8934 0001
aecom.com

Imagine it. Delivered.

LinkedIn Twitter Facebook Instagram



AECOM

Record of conversation

Project	Maxwell Project	Date	19.12.18
Subject	Review of draft ACHAR	Time	13:48
Participants (AECOM)	Geordie Oakes	File/ref no	
Participants (client/other)	Margaret Mathews	Page	1 of 1
Distribution			

Margaret stated that her mail often goes missing & that she has n't recieved the report. Geordie explained that it was for the Maxwell Project, an underground mine. Also explaind all surface artefacts impacted by surface infrastructure would be collected & salvage excavation would be completed at one site near Edderton Road. Margaret said she agreed with that. Asked if she wanted another copy of the report sent, and she said no.

AECOM

Record of conversation

Project Maxwell Project
Subject Review of draft ACHAR
Participants (AECOM) Geordie Oakes
Participants (client/other) Deidre Perkins
Distribution

Date 19.12.18
Time 13:40
File/ref no
Page 1 of 1

"Im happy with the report" Deidre.

AECOM

Record of conversation

Project	Maxwell Project	Date	19.12.18
Subject	Review of draft ACHAR	Time	13:30
Participants (AECOM)	Georgie Oakes	File/ref no	
Participants (client/other)	Ungaroo Aboriginal Corporation (Allen Paget)	Page	1 of 1
Distribution			

Spoke to Melanie. She said she would let Allen know I called & forward him the report again.

AECOM

Record of conversation

Project	Maxwell Project	Date	19.12.18
Subject	Review of draft ACHAR	Time	13:10
Participants (AECOM)	Geordie Oakes	File/ref no	
Participants (client/other)	AI Indigenous Services (Carolyn Hickey)	Page	1 of 1
Distribution			

Carolyn stated she had forgotten about reviewing the report & would do so tonight.

AECOM

Record of conversation

Project	Maxwell Project	Date	19.12.18
Subject	Review of Draft ACHAR	Time	13:04
Participants (AECOM)	Geordie Oakes	File/ref no	
Participants (client/other)	Widescope (Steven Hickey)	Page	1 of 1
Distribution			

Steve not available. Left message.

Steve returned call at 13:08 and stated he reviewed the report and was happy with it.

AECOM

Record of conversation

Project	Maxwell Project	Date	19.12.18
Subject	Review of draft ACHAR	Time	13:00
Participants (AECOM)	Geordie Oakes	File/ref no	
Participants (client/other)	Kauwul Wonn1 (Arthur Fletcher)	Page	1 of 1
Distribution			

Arthur stated that he hasn't had a chance to review the report. Asked to be emailed a copy. Geordie agreed to email him.

AECOM

Record of conversation

Project	Maxwell Project	Date	19.12.18
Subject	Review of draft ACHAR	Time	12:50
Participants (AECOM)	Geordie Oakes	File/ref no	
Participants (client/other)	Gomeroy Cultural Consultants (Dave Horton)	Page	1 of 1
Distribution	—		

Dave stated that it was an underground mine so it shouldn't be a problem. Sites wouldn't be impacted. Geordie explained that some sites would be impacted at the mine entry area & that these would be surface collected. Also explained that we have recommended salvage excavation of the site along Edderton Road. Dave stated he was happy with that. He said he didn't recieve a copy of the report. Geordie agreed to send him one.

AECOM

Record of conversation

Project: Maxwell Project
Date: 19.12.18
Subject: Review of draft ACHAR
Time: 13:37
Participants (AECOM): Geordie Oakes
File/ref no
Participants (client/other): Wallagan Cultural Services (Maree Waugh)
Page 1 of 1
Distribution

Left msg.

20.12.18 Maree called & stated she was happy with the report recomendations

AECOM

Record of conversation

Project	Maxwell Project	Date	19.12.18
Subject	Review of draft ACHAR	Time	13:25
Participants (AECOM)	Geordie Oakes	File/ref no	
Participants (client/other)	HVAC (Ross Pahuru)	Page	1 of 1
Distribution			

No answer. Left msg.

20.12.18 Ross called & stated he no longer worked for HVAC. Ross suggested I contacted HVAC directly.

AECOM

Record of conversation

Project: Maxwell Project
Subject: Review of draft ACHAR
Participants (AECOM): Geordie Oakes
Participants (client/other): WLALC (Noel Downe)
Distribution

Date: 19.12.18
Time: 13:56
File/ref no
Page 1 of 1

Noel stated he hasn't had a chance to look at the report & asked if I could sent him a reminder email.

21.12.18 Noel called to say he will not get a chance to respond to the report until late Jan 19. He said he'd like to respond and has some comments around Scott Frank's assertions regarding consultation and around some cultural information he and the LALC have gathered.

Appendix J

Consultation Log

Date	RAP	RAP Representative	Contact	Correspondence/Comments
15/06/2018	ROI request of interest sent to stakeholders			
19/06/2018	DNC	Paul Boyd	Email	Registering interest
20/06/2018	WLALC	Jamie-Lee	Email	Registering interest
20/06/2018	Margaret Mathews	Margaret Mathews	Phone	Registering interest
20/06/2018	Divine Diggers	Deidre Perkins	Phone	Registering interest
20/06/2018	Wallagan Cultural Services	Maree Waugh	Phone	Registering interest
20/06/2018	Culturally Aware	Tracey Skene	Phone	Registering interest
21/06/2018	ELM Corp	Des Hickey	Email	Registering interest
21/06/2018	Wattaka Wonnarua Cultural Consultancy Services	Des Hickey	Email	Registering interest
21/06/2018	Ungaroo Aboriginal Corporation	Allen Paget	Email	Registering interest
21/06/2018	Tocomwall Pty Ltd	Scott Franks	Email	Registering interest. Tocomwall notes in the registration that the PCWP does not authorise Registered Aboriginal parties that register under section 4.1.3 of the office Environment and Heritage's Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010(DECCW2010)
25/06/2018	AGA Services	Ashley Sampson	Email	Registering interest
25/06/2018	Cacatua	George Sampson	Email	Registering interest
27/06/2018	Hunter Valley Aboriginal Corporation	Ross Pahuru	Email	Registering interest
28/06/2018	Lower Hunter Wonnarua Cultural Services	Tom Miller	Email	Registering interest
28/06/2018	Murra Bidgee Mullangari	Ryan Johnson	Email	Registering interest
28/06/2018	Ungooroo culture& community service	Rhonda Ward	Email	Registering interest
29/06/2018	Gidawaa Walang Cultural Heritage Consultancy	Craig Horne	Email	Registering interest
29/06/2018	Yinarr Cultural Services	Kathie Steward Kinchela	Email	Registering interest
2/07/2018	Merrigarn	Shaun Carrol	Email	Registering interest
3/07/2018	Muragadi	Jessie Carrol-Johnson	Email	Registering interest
6/07/2018	Wailwan Aboriginal Digging Group	Phil Boney	Phone	Registering interest
4/07/2018	Amanda Hickey Cultural Services	Amanda Hickey	Email	Registering interest
4/07/2018	A1 Indigenous Services	Carolyn Hickey	Email	Registering interest
3/07/2018	Widescope	Steven Hickey	Email	Registering interest
8/07/2018	Kauwul Wonn1	Suzie Worth for Arthur Fletcher	Email	Registering interest
18/07/2018	Gomeroy Cultural Consultants	Dave Horton	Email	Registering interest
19/07/2018	Methodology sent to RAPs			
25/07/2018	PCWP	Scott Franks	Phone	Has issues with consultation process. PCWP should be the only RAP. Study Area contains Spur Hill Project area which has a Section 29 over it.
25/07/2018	PCWP	Scott Franks	Email	Has issues with methodology. Advises "this mining lease currently have an outstanding Section 29 RTN with the registered Native title party, and as such the registered Native title party cannot support the proposed methodology you have applied to use for the project. The attempt to engage with registered Aboriginal parties and then simply except those people as being Traditional knowledge holders for that area is in oppositions to the current CCGL 2010. One element of your document fails to address section 3 and also page 5 of the (following link for your information"
30/07/2018	Wallagan Cultural Services	Maree Waugh	Email	Agrees with methodology + insurances
6/08/2018	PCWP	Scott Franks	Phone	GO called Scott to discuss PCWP requirements for cultural values assessment. Was informed that cultural mapping was required as the study area

Date	RAP	RAP Representative	Contact	Correspondence/Comments
				was near the Mount Arthur Massacre site and songlines. Also, that there was crown land in the study area and PCWP had the right to negotiate.
8/08/2018	Widescope	Steven Hickey	Email	Agrees with methodology
10/08/2018	ACHAR information session held at Maxwell office			
15/08/2018	Wallagan Cultural Services	Maree Waugh	Phone	Maree called to check that insurances came through.
15/08/2018	Hunter Valley Aboriginal Corporation	Ross Pahuru	Email	Ross emailed to check how long the meeting lasted.
16/08/2018	Kauwul Wonn1	Suzie Worth for Arthur Fletcher	Email	Provided insurances
17/08/2018	DNC	Lilly Carroll	Email	Provided insurances
17/08/2018	Muragadi	Jessie Carrol-Johnson	Email	Provided insurances
17/08/2018	Murra Bidgee Mullangari	Ryan Johnson	Email	Provided insurances
17/08/2018	Merrigarn	Shaun Carrol	Email	Provided insurances
17/08/2018	Ungaroo Aboriginal Corporation	Melanie Schulz	Email	Provided insurances
17/08/2018	Gidawaa Walang Cultural Heritage Consultancy	Craig Horne	Email	Provided insurances
17/08/2018	Hunter Valley Aboriginal Corporation	Ross Pahuru	Email	Provided insurances
17/08/2018	AECOM	Geordie Oakes	Email	Roster provided to stakeholders by email
17/08/2018	PCWP	Scott Franks	Email	Stated that he did not support the proposed survey as the client has not complied without standing native title issues nor meet conditions under the 2010 CCGL 2010 OEH
17/08/2018	Ungooroo culture& community service	Rhonda Ward	Email	Provided insurances
17/08/2018	Aleira French Trading	Aliera French	Email	Provided insurances
17/08/2018	Valley ELM	Irene	Email	Provided insurances
17/08/2018	Wattaka Wonnarua Cultural Consultancy Services	Des Hickey	Email	Provided insurances
17/08/2018	WLALC	Rosslyn Thomson	Email	Provided insurances
17/08/2018	Lower Hunter Wonnarua Cultural Services	Tom Miller	Email	Registering interest
17/08/2018	Dave Horton	Dave Horton	Email	Provided insurances
17/08/2018	Fieldwork roster sent out to RAPs			
17/08/2018	Widescope	Steven Hickey	Email	Requested a change in rostered fieldwork days
19/12/2018	DNC	Paul Boyd	Email	Supports the assessment and recommendations
19/12/2018	WLALC (Noel Downs)	Noel Downs	Phone	Hasn't had time to review the report. Requested a reminder email. Email sent by AECOM.
19/12/2018	Margaret Mathews	Margaret Mathews	Phone	Hasn't reviewed the report. Explained the findings and management recommendations. Margaret said she was happy with the recommendations
19/12/2018	Divine Diggers	Deidre Perkins	Phone	Supports the assessment and recommendations
19/12/2018	Wallagan Cultural Services (Maree Waugh)	Maree Waugh	Phone	No answer. Left msg.
19/12/2018	Culturally Aware (Tracey Skene)	Tracey Skene	Phone	No answer. Left msg.
19/12/2018	ELM Corp	Des Hickey	Phone	No answer.
19/12/2018	Wattaka Wonnarua Cultural Consultancy Services	Irene	Phone	No answer.
19/12/2018	Ungooroo Aboriginal Corporation	Allen Paget	Phone	Spoke with Melanie who will request a response from Allen Paget
19/12/2018	AGA Services	George Sampson	Phone	No answer. Left msg.
19/12/2018	Cacatua	George Sampson	Phone	No answer. Left msg.
19/12/2018	Hunter Valley Aboriginal Corporation	Ross Pahuru	Phone	No answer. Left msg.
19/12/2018	Lower Hunter Wonnarua Cultural Services	Tom Miller	Phone	No answer.
21/08/2018	PCWP	Scott Franks	Email	Does not support the methodology.
27/08/2018	Widescope	Steven Hickey	Email	Cannot attend rostered fieldwork days
18/11/2018	Draft ACHAR sent to RAPs			

Date	RAP	RAP Representative	Contact	Correspondence/Comments
28/11/2018	Gidawaa Walang Cultural Heritage Consultancy	Craig Horne	Email	Supports the assessment and recommendations
26/11/2018	Murra Bidgee Mullangari	Ryan Johnson	Email	Supports the assessment and recommendations
21/12/2018	PCWP	Scott Franks	Email	"Tocomwall with a licence and consent of the registered Native title party PCWP do not except or give permission to Registered Aboriginals party's assessing or making comment on the cultural values with in the registered native title clamed area. As you would be aware in September 2018 Tocomwall lodged several sites cards with AHMIS one of which covers the Maxwell mining operation's ELA, the company in question is very familiar with the registered native title part as per a section 29 notice that was attached to the previous approval before the MLA was withdrawn" "As the company has been involved in a section 29 notification under native title it is ridiculous for this company to now try and refuse to except who and which group is a traditional knowledge holder as described in the 2010 CCGL for proponents. To allow people to asses our country and to make decisions on our cultural lore and customs is appalling. This being said with regard to the sites card for that location and the confidential assessment conducted by Tocomwall and the upper hunters breeders association. As this document is controlled by The upper hunters Breeders association, Tocomwall will be using this information direct with OEH and the federal Government to lodge a section 9 and section 10 applications under the Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Cth) (the ATSIHP Act). Tocomwall would further like to state that this company has known issue with the work AECOM are conduction but we take exception to the way Maxwell are side stepping issues we have raised with you and OEH"
19/12/2018	Ungooroo culture & community service	Rhonda Ward	Email	No comment but wanted to be involved in all decisions and work
19/12/2018	Yinarr Cultural Services	Kathie Steward Kinchela	Phone	No answer.
19/12/2018	Merrigarn	Shaun Carrol	Phone	No answer.
19/12/2018	Muragadi	Jessie Carrol-Johnson	Phone	Disconnected
19/12/2018	Wailwan Aboriginal Digging Group (Phil Boney)	Phil Boney	(Phone not provided)	Email reminder sent about draft ACHAR
19/12/2018	Amanda Hickey Cultural Services	Amanda Hickey	Phone	Wrong number
19/12/2018	A1 Indigenous Services	Carolyn Hickey	Phone	Hasn't had time to review the report. Will do so tonight
19/12/2018	Widescope (Steven Hickey)	Steven Hickey	Phone	Supports the assessment and recommendations
19/12/2018	Kauwul Wonn1	Arthur Fletcher	Phone	Hasn't had time to review the report. Requested report be emailed again
19/12/2018	Gomeroy Cultural Consultants	Dave Horton	Phone	Hasn't received the report. Explained the findings and management recommendations. Dave said he was happy with the recommendations. Requested a hard copy of the report.
20/12/2018	Amanda Hickey Cultural Services	Amanda Hickey	Email	Amanda stated 'AHCS is happy with the draft report'
20/12/2018	Cacatua	George Sampson	Emal	Supports the assessment and recommendations

Date	RAP	RAP Representative	Contact	Correspondence/Comments
20/12/2018	AGA Services	George Sampson	Emal	Supports the assessment and recommendations
20/12/2018	Hunter Valley Aboriginal Corporation	Ross Pahuru	Phone	Ross called and stated he no longer works for HVAC and to try contacting them directly.
20/12/2018	Wallagan Cultural Services	Maree Waugh	Phone	Maree called and stated she was happy with the report recommendations
20/12/2018	Culturally Aware	Tracey Skene	Email	Tracey emailed and stated she is happy with the mitigation recommendations in the report. Requests to be kept updated on assessment progress. Also requests community be involved in developing the management plan.
21/12/2018	WLALC	Noel Downs	Phone	Noel called to say he will not get a chance to provide a response until late January. He said he'd like to respond and has some comments around Scott Frank's assertions regarding consultation and around some cultural information he and the LALC have gathered.
27/12/2018	Wailwan Aboriginal Digging Group (Phil Boney)	Phil Boney	Email	No comments on the report
24/01/2019	Aleira French Trading	Aliera French	Email	Happy with the report

Appendix K

Lithic Data

Raw Material	Type	Length	Width	Thickness	Cortex	Core Blank	Number of Scars	Tool Type	XCOORD	YCOORD
Silicified tuff	Angular Shatter	14	10	8					294821.1	6410756
Silicified tuff	Angular Shatter	14	13	3					295006.5	6410975
Silicified tuff	Angular Shatter	13	10	10					300439.9	6412448
Silcrete	Angular Shatter	25	17	9					298995.9	6409642
Chert	Angular Shatter	36	28	30					298998.4	6409649
Silcrete	Angular Shatter	26	21	12					299085.3	6409962
Silicified tuff	Angular Shatter	61	32	22					299178.3	6409752
Silcrete	Angular Shatter	32	18	9					299164.2	6409738
Silicified tuff	Angular Shatter	31	16	7					299151.9	6409742
Silicified tuff	Angular Shatter	18	12	7					299146.5	6409676
Silicified tuff	Angular Shatter	9	14	3					299132.3	6409693
Silicified tuff	Angular Shatter	14	7	4					299130.1	6409687
Silicified tuff	Angular Shatter	24	22	18					299189.3	6408964
Silicified tuff	Angular Shatter	24	13	10					299158.9	6409239
Silicified tuff	Angular Shatter	19	11	6					299424.4	6408310
Silicified tuff	Angular Shatter	20	20	13					298293.1	6409029
Silicified tuff	Angular Shatter	11	12	5					298293.8	6409029
Silicified tuff	Angular Shatter	16	14	6					298293.3	6409029
Silicified tuff	Angular Shatter	22	14	6					298170.9	6408421
Silcrete	Angular Shatter	18	12	5					298134.7	6408770
Silicified tuff	Angular Shatter	17.2	8.3	4.4	No				297721.3	6408675
Silicified tuff	Angular Shatter	17.4	16.4	4.2	No				297741	6408632
Silicified tuff	Angular Shatter	19.9	44	14.3					297761.1	6408426
Silicified tuff	Angular Shatter	33	32	13.2	No				297764	6408424
Silicified tuff	Angular Shatter	33.5	19.4	8.7	No				297763.8	6408431
Silicified tuff	Angular Shatter	39	30	23	Yes				297755.7	6408599
Silicified tuff	Angular Shatter	39	24	16	No				297826.6	6408677
Silicified tuff	Angular Shatter	37	27	24					297994.5	6408479
Silicified tuff	Angular Shatter	23	17	11					298041.2	6408483
Silicified tuff	Angular Shatter	35	39	15	No				297988.7	6408782
Silicified tuff	Angular Shatter	32	25	18					297991.1	6408782
Silicified tuff	Angular Shatter	31	21	7					297996.5	6408780

Raw Material	Type	Length	Width	Thickness	Cortex	Core Blank	Number of Scars	Tool Type	XCOORD	YCOORD
Silicified tuff	Angular Shatter	21	9	8	No				298048.5	6408911
Silicified tuff	Angular Shatter	27	29	10	No				298124.4	6408863
Silcrete	Angular Shatter	40	28	18					298125.2	6408845
Silcrete	Angular Shatter	26	18	14					298133.7	6408841
Quartz	Angular Shatter	9	11	3					298132.7	6408841
Silcrete	Angular Shatter	29	16	7					298132.9	6408841
Silcrete	Angular Shatter	48	28	24					298132.1	6408841
Silicified tuff	Angular Shatter	40	27	16					298115.4	6408842
Silcrete	Angular Shatter	26	23	13					298104	6408844
Silcrete	Angular Shatter	14	15	4					298074.8	6408829
Silicified tuff	Angular Shatter	30	29	16					298103.9	6408832
Silicified tuff	Angular Shatter	22	26	9					298121.8	6408825
Silcrete	Angular Shatter	21	11	5					298103.8	6408806
Chert	Angular Shatter	21	24	8					298121.7	6408739
Silicified tuff	Angular Shatter	35	23	15					298063.3	6408415
Silicified tuff	Angular Shatter	26	10	7					298063.1	6408377
Chert	Angular Shatter	13	19	6					298140.6	6408266
Silcrete	Angular Shatter	28	24	11					298139.3	6408267
Silcrete	Angular Shatter	39	25	9					298139	6408260
Silicified tuff	Angular Shatter	20	22	12					298111.9	6408274
Silcrete	Angular Shatter	19	17	12					298121.5	6408213
Silicified tuff	Angular Shatter	21	20	5					298125.9	6408209
Silicified tuff	Angular Shatter	40	30	24	No				296778.1	6408460
Silicified tuff	Angular Shatter	50.8	34.5	24.8					297326.6	6408132
Silicified tuff	Angular Shatter	26.1	17.43	8	No				297314.2	6408118
Silicified tuff	Angular Shatter	18.7	9	4.7	No				297312.7	6408116
Silicified tuff	Angular Shatter	18.1	17.8	5.39	Yes				297295.9	6408109
Silicified tuff	Angular Shatter	33	28.2	2.3	No				297297.4	6408125
Silicified tuff	Angular Shatter	22.1	12.4	9.1	No				297298.2	6408125
Silicified tuff	Angular Shatter	27.1	17.1	7.8	No				297296.7	6408126
Silicified tuff	Angular Shatter	26.5	17.7	15.8	No				297298.4	6408129
Silicified tuff	Angular Shatter	19.7	23.6	10.8	No				297246.8	6408465

Raw Material	Type	Length	Width	Thickness	Cortex	Core Blank	Number of Scars	Tool Type	XCOORD	YCOORD
Silicified tuff	Angular Shatter	21.5	12.4	9.9	No				297262.2	6408397
Silicified tuff	Angular Shatter	10.4	17.3	5.5					297343.2	6408113
Silicified tuff	Angular Shatter	30	21	12	No				296961.1	6407878
Silicified tuff	Angular Shatter	15.7	25	6.3	No				297575.2	6407951
Silicified tuff	Angular Shatter	8.8	18.4	4.2	No				297575.9	6407952
Silicified tuff	Angular Shatter	21	13	6	No				297544	6407943
Silicified tuff	Angular Shatter	32	28	22	No				297540.6	6407942
Silicified tuff	Angular Shatter	16	13	3					297539.4	6407936
Silicified tuff	Angular Shatter	18	17	5					297450.3	6408008
FGS Other	Axe	117	81	40					295245.2	6409343
FGS Other	Axe	141	74	36					297721.6	6408580
Basalt	Axe	84	70	30					298435.3	6408666
Basalt	Axe	78	73	27					298513.3	6408409
Basalt	Axe frag	95	65	30					298137.8	6408823
Basalt	Axe (ground) frag	69	39	23					298536.4	6409313
Basalt	Axe (ground) frag	105	58	49					298842.1	6410025
Basalt	Axe (ground)	117	43	33					298879.6	6410291
FGS Other	Axe	112	59	58	Yes				298999	6409753
FGS Other	Chopper	93	73	33					298131	6408210
Silcrete	Chopper	95	88	36					298996.9	6409609
Silicified tuff	Bidirectional core	100	62	33	Yes		7		295097	6409291
Quartz	Unidirectional core	28	21	20					299321.8	6409671
Silicified tuff	Unidirectional core	57	69.9	24.8	Yes	Cobble	2		297275.5	6408516
Silicified tuff	Multidirectional core	47	57	8			6		294860.2	6409081
Silicified tuff	Multidirectional core	28	20	29			3		298014.5	6408932
Silcrete	Multidirectional core	120	100	46					299125.4	6412649
Silcrete	Unidirectional core	60	48	39	Yes		5		299202.6	6409020
Silicified tuff	Multidirectional core	25.5	44.1	24.7	No		11		297758.4	6408427
Silicified tuff	Multidirectional core	62.5	40	39	No		3		297764.3	6408429
Silcrete	Multidirectional core	32	46	52			9		298126.9	6408213
Silicified tuff	Multidirectional core	58.3	39.7	0		Cobble	3		296980.7	6408244
Silicified tuff	Multidirectional core	44.1	46.1	32.4	No	Indeterminate	5		297345.5	6408269

Raw Material	Type	Length	Width	Thickness	Cortex	Core Blank	Number of Scars	Tool Type	XCOORD	YCOORD
Silicified tuff	Multidirectional core	35	30.9	24.4	No				297345.1	6408104
Silicified tuff	Multidirectional core	33	42	26	Yes				297537.6	6407941
Silcrete	Unidirectional core	90	63	54	Yes		2		299058.8	6412839
Silcrete	Unidirectional core	96	75	61	Yes		4		299074.9	6412829
Silicified tuff	Unidirectional core	80	37	4	Yes		2		299029.2	6409647
Silicified tuff	Unidirectional core	72	75	31			3		299094.1	6408963
Silcrete	Unidirectional core	23	52	25	Yes	Flake	2		299391.2	6408232
Silcrete	Unidirectional core	107	87	72			2		298239.7	6408761
Silcrete	Unidirectional core	60	102	59	Yes	Cobble	5		298704	6408304
Silicified tuff	Unidirectional core	101	93	33		Cobble	4		298966.6	6408171
Silcrete	Unidirectional core	74	56	27	Yes				297741.4	6408631
Silicified tuff	Unidirectional core	109.6	70.2	30.4	Yes				297917.3	6408699
Silicified tuff	Unidirectional core	39	29	35			2		298122.8	6408837
Silicified tuff	Unidirectional core	60	59	38			2		298126.8	6408801
Silicified tuff	Unidirectional core	50	72	54			1		298123.8	6408763
Silicified tuff	Unidirectional core	75.5	45.9	44.4	Yes		2		296777.5	6408311
Silicified tuff	Unidirectional core	38	60	54	Yes	Cobble	3		298334.5	6409508
Silicified tuff	Unidirectional core	60	46	22	Yes		1		298434.5	6407954
Silicified tuff	Unidirectional core	28.6	20.1	35	No	Indeterminate	2		297720.5	6408675
FGS Other	Unidirectional core	30.3	42.3	20.5			1		297763.7	6408439
Silicified tuff	Unidirectional core	57	37	40		Indeterminate	1		298124.3	6408863
Silicified tuff	Unidirectional core	109.6	78.1	58.3	Yes		2		297119.1	6408254
FGS Other	Unidirectional core	90	74.4	49.7	Yes		3		297254.8	6408121
Silicified tuff	Unidirectional core	97.7	63.2	21	Yes		3		297249.9	6408556
Silicified tuff	Unidirectional core	30.9	50	26.5	No	Indeterminate	5		297351.2	6408201
Silicified tuff	Unidirectional core	62	53	49	Yes		11		299212.3	6409650
Porcellanite	Unidirectional core	50	40	20			3		301933.6	6414592
Silicified tuff	Core frag	63	21	16					298834	6409629
Silicified tuff	Complete Flake	50	43	32	Yes	Indeterminate	5		299127.7	6409650
Silicified tuff	Complete Flake	61	45	16					299361.6	6410111
Silicified tuff	Complete Flake	31	30	8					299252.6	6408895
Silicified tuff	Complete Flake	19	15	5					298528.8	6409236

Raw Material	Type	Length	Width	Thickness	Cortex	Core Blank	Number of Scars	Tool Type	XCOORD	YCOORD
Silicified tuff	Complete Flake	36	26	7					298018.9	6408538
Quartz	Complete Flake	24	17	11					298009.6	6408918
Silcrete	Complete Flake	36	31	9					301932.6	6414606
Porcellanite	Complete Flake	32	15	7					301926.2	6414606
Silcrete	Complete Flake	20	20	5					301934	6414598
FGS Other	Complete Flake	53	37	15					301750.6	6413899
Silcrete	Complete Flake	30	27	10					301729.5	6413890
Quartz	Complete Flake	20	22	6					301728.5	6413892
Silicified tuff	Complete Flake	28	30	4					301572.8	6413490
Silcrete	Complete Flake	26	27	5					294825.6	6409010
Silcrete	Complete Flake	34	25	11					294830.6	6409018
Silicified tuff	Complete Flake	37	42	14					294893.7	6409154
Silicified tuff	Complete Flake	14	16	3					294909.1	6410866
Silicified tuff	Complete Flake	28	26	5					295006.1	6410976
Silicified tuff	Complete Flake	44	39	12					295488.2	6411669
Silicified tuff	Complete Flake	102	56	30					294930.9	6409391
Silicified tuff	Complete Flake	64	54	33					294997.1	6409393
Silicified tuff	Complete Flake	30	32	8					295174.8	6409230
Silicified tuff	Complete Flake	30	25	6					295175.4	6409259
Silicified tuff	Complete Flake	31	22	10					300439.5	6412450
Silicified tuff	Complete Flake	43	30	16					300289.3	6412560
Silicified tuff	Complete Flake	39	28	9					300351.6	6412669
Quartzite	Complete Flake	28	40	9					300488.6	6412607
Silicified tuff	Complete Flake	90	32	8					300460.2	6409287
Silcrete	Complete Flake	15	13	3					300570.3	6409950
Chert	Complete Flake	23	23	6					299323.7	6412393
Silicified tuff	Complete Flake	44	16	5					299246.8	6412433
Silicified tuff	Complete Flake	26	20	5					299233.6	6412479
Silcrete	Complete Flake	60	26	13					299249.9	6412511
Silcrete	Complete Flake	51	56	17					299073	6412783
Silicified tuff	Complete Flake	18	14	3					299080.8	6412778
Silcrete	Complete Flake	25	27	8					299077.5	6412774

Raw Material	Type	Length	Width	Thickness	Cortex	Core Blank	Number of Scars	Tool Type	XCOORD	YCOORD
Silicified tuff	Complete Flake	56	36	15					298969.2	6409471
Silicified tuff	Complete Flake	38	19	12					298977.7	6409500
Silcrete	Complete Flake	30	28	14					299006.2	6409496
Silicified tuff	Complete Flake	18	13	4					298996.1	6409542
Silcrete	Complete Flake	43	42	11					298991.5	6409580
Silcrete	Complete Flake	22	22	8					298998	6409603
Silicified tuff	Complete Flake	20	14	3					299006.5	6409608
Silcrete	Complete Flake	40	24	8					298998	6409612
Silcrete	Complete Flake	42	18	14					299002.5	6409631
Silicified tuff	Complete Flake	37	21	8					299001.5	6409636
Silcrete	Complete Flake	46	26	11					299001.6	6409636
Silcrete	Complete Flake	25	32	5					298996.9	6409639
Silicified tuff	Complete Flake	30	26	10					298997.4	6409641
Quartzite	Complete Flake	76	40	17					298998.2	6409655
Silcrete	Complete Flake	40	25	12					299006.6	6409647
Silcrete	Complete Flake	13	24	5					299003.3	6409648
Silicified tuff	Complete Flake	32	47	10					299005.1	6409650
Silicified tuff	Complete Flake	50	32	19					299003	6409651
Silcrete	Complete Flake	24	19	12					299003.7	6409651
Silcrete	Complete Flake	26	30	7					299005.2	6409652
Silicified tuff	Complete Flake	42	26	9					299022.3	6409642
Silicified tuff	Complete Flake	49	21	18					299027.9	6409640
Silicified tuff	Complete Flake	38	35	7					299028.9	6409641
Silicified tuff	Complete Flake	24	22	4					299032.4	6409642
Silicified tuff	Complete Flake	19	20	5					299040.4	6409642
Silicified tuff	Complete Flake	20	18	4					299043.8	6409663
Silicified tuff	Complete Flake	20	8	2					299027.8	6409657
Silicified tuff	Complete Flake	45	26	12					299049.3	6409880
Silicified tuff	Complete Flake	21	37	10					299150.8	6409741
Silicified tuff	Complete Flake	34	10	4					299133.3	6409693
Quartz	Complete Flake	40	25	13					299135.6	6409679
Silicified tuff	Complete Flake	14	24	6					299133.9	6409659

Raw Material	Type	Length	Width	Thickness	Cortex	Core Blank	Number of Scars	Tool Type	XCOORD	YCOORD
Silicified tuff	Complete Flake	51	48	20					299126.3	6409310
Silicified tuff	Complete Flake	16	17	5					299088.5	6409279
Silicified tuff	Complete Flake	35	25	11					299132.2	6409038
Silcrete	Complete Flake	41	33	16					299214.4	6409130
Silicified tuff	Complete Flake	11	19	3					299187.5	6409481
Silicified tuff	Complete Flake	68	54	19					299232.4	6409499
Silicified tuff	Complete Flake	16	23	6					299198.1	6409654
Silicified tuff	Complete Flake	36	26	9					299195.9	6409660
Silicified tuff	Complete Flake	32	24	7					299219.5	6409667
Quartz	Complete Flake	26	16	9					299323.8	6409672
Silicified tuff	Complete Flake	32	35	8					299325.7	6409617
Silicified tuff	Complete Flake	17	21	11					299323.2	6409193
Silicified tuff	Complete Flake	27	19	12					299092.3	6408519
Silicified tuff	Complete Flake	16	46	24					299366.6	6408181
Silicified tuff	Complete Flake	29	29	10					299364.7	6408173
Silicified tuff	Complete Flake	13	30	8					298296.8	6409032
Silicified tuff	Complete Flake	12	14	2					298291.4	6409032
Silicified tuff	Complete Flake	27	18	9					298360.6	6409031
Silicified tuff	Complete Flake	45	54	12					298490.8	6409778
Silcrete	Complete Flake	18	17	3					298490.8	6409778
Silcrete	Complete Flake	37	28	10					298429.3	6409079
Silicified tuff	Complete Flake	23	18	8					298645	6410090
Quartz	Complete Flake	34	21	10					298696.2	6410011
Silcrete	Complete Flake	39	24	12					298170.2	6408421
Silcrete	Complete Flake	38	30	8					298134.3	6408765
Silicified tuff	Complete Flake	36	32	15					298137.8	6408768
Silicified tuff	Complete Flake	13	15	3					298136.1	6408822
Silicified tuff	Complete Flake	44.9	46.3	13.4	No				297738.1	6408636
Silcrete	Complete Flake	47.8	43.9	17.1	No				297741	6408633
Quartzite	Complete Flake	41	56.9	11.2	No				297742.7	6408636
Silcrete	Complete Flake	23.5	18	5.8					297721.7	6408576
Silicified tuff	Split Flake (Siret)	51	33	17	No				297738.3	6408645

Raw Material	Type	Length	Width	Thickness	Cortex	Core Blank	Number of Scars	Tool Type	XCOORD	YCOORD
Silicified tuff	Complete Flake	12.6	19	4.4					297757.5	6408427
Chert	Complete Flake	18.3	19.8	3.4	No				297758.3	6408423
Silicified tuff	Complete Flake	33	37.5	13.1	Yes				297764.3	6408423
Silicified tuff	Complete Flake	15.8	23.8	4.3	No				297762.3	6408430
Silicified tuff	Complete Flake	27.5	25.9	10.1	No				297759.9	6408433
Silicified tuff	Complete Flake	23	32.9	7.7	No				297756.7	6408431
Silicified tuff	Split Flake	30	23.6	10.8	No				297757.8	6408429
Silicified tuff	Complete Flake	20	19	1	No				297760.7	6408605
Silicified tuff	Complete Flake	23.4	22.4	8.8	No				297891	6408655
Silicified tuff	Complete Flake	31	17.6	5.6	No				297869.6	6408664
Silicified tuff	Complete Flake	48	45	12	No				297858.9	6408664
Silicified tuff	Complete Flake	13	13	5	No				297851.9	6408669
Silicified tuff	Complete Flake	40	21	8	No				297879.3	6408310
Silicified tuff	Complete Flake	10	15	3	No				297882.9	6408313
Silicified tuff	Complete Flake	51	43	10					297959.1	6408454
Silicified tuff	Complete Flake	25	18	8	Yes				297980.3	6408452
Silcrete	Complete Flake	30	14	6	No				298034.2	6408485
Silcrete	Complete Flake	51	45	15	No				297987.6	6408588
Silicified tuff	Complete Flake	26	26	9	No				298018	6408917
Silicified tuff	Complete Flake	19	27	4	No				298123.9	6408861
Silicified tuff	Complete Flake	31	30	14					298121.3	6408852
Silicified tuff	Complete Flake	35	29	6					298121.7	6408851
Silicified tuff	Complete Flake	37	25	9					298113.5	6408836
Silicified tuff	Complete Flake	30	20	10					298078.8	6408832
Silcrete	Complete Flake	31	30	9					298072.5	6408830
Silicified tuff	Complete Flake	24	17	6					298103.7	6408829
Chert	Complete Flake	27	24	6					298116.9	6408764
Silicified tuff	Complete Flake	66	41	26					298121.9	6408738
Silicified tuff	Complete Flake	26	23	9					298126.8	6408701
Silcrete	Complete Flake	53	26	11					298108.6	6408490
Silcrete	Complete Flake	73	62	12					298108	6408450
Silicified tuff	Complete Flake	40	30	30					298110.1	6408449

Raw Material	Type	Length	Width	Thickness	Cortex	Core Blank	Number of Scars	Tool Type	XCOORD	YCOORD
Silicified tuff	Complete Flake	20	21	6					298067.7	6408435
Silicified tuff	Complete Flake	30	30	10					298065.8	6408385
Silicified tuff	Complete Flake	13	16	3					298048.2	6408380
Silicified tuff	Complete Flake	31	49	11					298117.1	6408371
Silicified tuff	Broken Fl (Proximal)	26	25	15					298094.1	6408356
Chert	Complete Flake	42	33	11					298144.6	6408277
Silicified tuff	Complete Flake	18	30	10					298132.8	6408255
Volcanic	Complete Flake	26	27	5					298114.4	6408257
Silicified tuff	Complete Flake	20	24	7					298074.1	6408172
Silicified tuff	Complete Flake	32	22	14	Yes				296777.6	6408461
Silicified tuff	Complete Flake	43	31	11	Yes				296778.1	6408461
Silcrete	Complete Flake	57	34.5	21.1	Yes				296685.3	6408281
Chert	Complete Flake	34.6	34.7	13.6	Yes				297291.2	6408188
Silicified tuff	Complete Flake	40.8	28.4	11.8	Yes				297293.4	6408185
Silicified tuff	Complete Flake	17.4	13.8	4.9					297308.4	6408175
Silicified tuff	Complete Flake	40.2	26.1	17	Yes				297325.9	6408127
Silicified tuff	Complete Flake	19.2	7.3	1.8	No				297325	6408127
Silicified tuff	Complete Flake	28	35.5	13.5	No				297324.4	6408125
Silicified tuff	Complete Flake	38.3	34	20.9	Yes				297322.2	6408127
Silicified tuff	Complete Flake	14.2	13.1	3.2	No				297321	6408121
FGS Other	Complete Flake	28.6	23.8	4.6	Yes				297315.4	6408120
Silicified tuff	Complete Flake	39	32	38	No				297314.8	6408120
Silicified tuff	Complete Flake	22.2	14.9	4	No				297303.1	6408084
Silicified tuff	Complete Flake	52.4	55.71	18.6					297297.3	6408121
Silicified tuff	Complete Flake	16	21	5.1					297297.7	6408124
Chert	Complete Flake	16.1	10.7	2.91	No				297296.6	6408125
Silicified tuff	Complete Flake	25.5	19.9	5.3	No				297297.2	6408125
Silicified tuff	Complete Flake	59.1	46.7	10.4					297270.5	6408096
Silicified tuff	Complete Flake	22.4	18.2	4.5	No				297259.6	6408093
Silicified tuff	Complete Flake	28.1	26.4	6.4					297169.4	6408110
Silicified tuff	Complete Flake	45.4	53.7	12.6	No				297248	6408466
Silicified tuff	Complete Flake	17.5	24.5	6.5	No				297258.1	6408406

Raw Material	Type	Length	Width	Thickness	Cortex	Core Blank	Number of Scars	Tool Type	XCOORD	YCOORD
Silicified tuff	Complete Flake	39.6	27.1	7.1	Yes				297265.2	6408404
Silicified tuff	Complete Flake	13.1	22	7.7					297325.4	6408380
Silcrete	Complete Flake	63	47	13.2	No				297350.1	6408199
Silicified tuff	Complete Flake	33	43.2	12.1	Yes				297335.7	6408155
Silicified tuff	Complete Flake	40.6	52.6	13.4	No				297343.9	6408112
Silicified tuff	Complete Flake	50	47.5	13.5	No				297343.6	6408108
Silicified tuff	Complete Flake	21.2	15.7	4.8	No				297400.1	6408007
Silcrete	Complete Flake	71.9	30.5	15	No				297266	6407962
Silicified tuff	Complete Flake	26.2	22.6	9.3	No				297218.9	6408002
Silicified tuff	Complete Flake	17.2	22	4.8	No				297019.1	6407969
Silicified tuff	Complete Flake	20.1	23.7	5.8	No				297576	6407951
Silicified tuff	Complete Flake	23.3	27.9	5.8	No				297577.9	6407948
Silicified tuff	Complete Flake	34	22	11	No				297544.6	6407942
Silicified tuff	Complete Flake	35	26	12	Yes				297538.2	6407940
Silicified tuff	Complete Flake	27	26	4	No				297452.6	6408052
Silicified tuff	Complete Flake	64	38	15	Yes				297402.7	6408019
Silcrete	Complete Flake	24	17	5	No				297342.4	6408673
Silcrete	Complete Flake	23	12	5	No				297342.6	6408671
Silcrete	Complete Flake	43	34	13					299081	6409946
Silcrete	Complete Flake	40	17	9					299137.6	6409902
Silicified tuff	Complete Flake	27	37	8					299175.1	6409757
Silcrete	Complete Flake	30	15	5					299166.7	6409738
Silicified tuff	Complete Flake	19	19	3					299159.7	6409713
Silicified tuff	Complete Flake	17	14	4					299153.4	6409705
Silicified tuff	Complete Flake	28	12	9					299144.3	6409679
Quartz	Complete Flake	11	14	3					299128.1	6409685
Silcrete	Complete Flake	19	10	3					299128.6	6409681
Silcrete	Complete Flake	20	17	6					299127.7	6409679
Silicified tuff	Complete Flake	41	45	11					299140.9	6409647
Silcrete	Complete Flake	31	22	7					299090.3	6409273
Silicified tuff	Complete Flake	50	25	11					299078.5	6409243
Silicified tuff	Complete Flake	32	24	16					299038	6409148

Raw Material	Type	Length	Width	Thickness	Cortex	Core Blank	Number of Scars	Tool Type	XCOORD	YCOORD
Silicified tuff	Complete Flake	24	22	17					299190.8	6408965
Silcrete	Complete Flake	18	18	4					299196.1	6408968
Silicified tuff	Complete Flake	36	30	16					299196.6	6408969
Silicified tuff	Complete Flake	24	24	5					299201.9	6409020
Silcrete	Complete Flake	27	23	15					299172	6409035
Silicified tuff	Complete Flake	27	27	8					299211.3	6409131
Chert	Complete Flake	30	19	5					299192.5	6409148
Silcrete	Complete Flake	20	13	4					299186.2	6409155
Silicified tuff	Complete Flake	18	18	5					299147.4	6409227
Silicified tuff	Complete Flake	11	12	2					298295.5	6409030
Silicified tuff	Complete Flake	15	15	6					298291.9	6409033
Silicified tuff	Complete Flake	25	19	6					298291.5	6409032
Silicified tuff	Complete Flake	27	18	7					298291.4	6409029
Silicified tuff	Complete Flake	43	22	9					298296.9	6409323
Silicified tuff	Complete Flake	16	17	5					298341.8	6409437
Silicified tuff	Complete Flake	41	41	12					298352	6409472
Silcrete	Broken Fl (Proximal)	16	18	5					298500.2	6409777
Silicified tuff	Complete Flake	37	41	7					298575.8	6409390
Silicified tuff	Complete Flake	47	40	16					298548.9	6410096
Quartz	Complete Flake	20	17	6					298549.6	6410095
Silcrete	Split Flake	46	36	12					298891.1	6409631
	Split Flake	27	14	6					298166.7	6408433
Silicified tuff	Complete Flake	26	42	7					298131.6	6408733
Silcrete	Complete Flake	42	19	11					298131.1	6408736
Silicified tuff	Complete Flake	26	20	13					298136.2	6408824
Silcrete	Complete Flake	41	43	11					298138	6408824
Silcrete	Complete Flake	16	12	6					298139.8	6408837
Silicified tuff	Complete Flake	48	26	21					298692	6408101
Silicified tuff	Complete Flake	26	42	21					298519	6408417
Quartz	Complete Flake	37	25.5	12.4	No				297761.1	6408426
Silicified tuff	Complete Flake	36.3	32.2	7.5	Yes				297754.3	6408430
Silicified tuff	Complete Flake	37.9	53	21					297879.1	6408652

Raw Material	Type	Length	Width	Thickness	Cortex	Core Blank	Number of Scars	Tool Type	XCOORD	YCOORD
Quartzite	Complete Flake	28	28	9					297979.8	6408445
Silicified tuff	Complete Flake	41	53	13	No				298061.1	6408896
Silcrete	Complete Flake	49	49	18	No				298078.5	6408915
Silicified tuff	Complete Flake	59	48	17					298080	6408911
Silicified tuff	Complete Flake	45	42	16	No				298076.4	6408894
Chert	Complete Flake	24	29	13					298127.9	6408857
Silicified tuff	Complete Flake	21	25	5					298133	6408843
Silcrete	Complete Flake	28	13	6					298135.3	6408844
Silicified tuff	Complete Flake	12	16	3					298118.3	6408845
Silicified tuff	Complete Flake	18	48	15					298131.3	6408828
Silicified tuff	Complete Flake	28	48	10					298120.6	6408803
Silicified tuff	Complete Flake	35	34	17					298124.7	6408796
Silicified tuff	Complete Flake	45	21	16					298035.7	6408430
Silicified tuff	Complete Flake	31	38	11					298111	6408452
Silicified tuff	Complete Flake	23	22	6					298059.4	6408370
Silicified tuff	Complete Flake	38	42	15					298115.7	6408249
Silicified tuff	Complete Flake	40	32	10					298125.7	6408216
Silcrete	Flake Shatter	26	30	22			3		298133.6	6408841
Silicified tuff	Flake Shatter	26	10	4				Blade	298127.5	6408816
Silicified tuff	Flake Shatter	33	18	8					299348.1	6409834
Silicified tuff	Flake Shatter	20	15	6					298413	6409034
Porcellanite	Flake Shatter	33	13	10					301928	6414603
Silicified tuff	Flake Shatter	20	10	5					301933.1	6414597
Porcellanite	Flake Shatter	16	12	3					301932.2	6414598
Porcellanite	Flake Shatter	12	11	8					301933.4	6414596
Silcrete	Flake Shatter	24	13	8					294826.7	6409013
Silicified tuff	Flake Shatter	30	20	5					294886	6409067
Silicified tuff	Flake Shatter	22	17	6					294649.5	6409946
Silicified tuff	Flake Shatter	24	14	8					294832	6410729
Silicified tuff	Flake Shatter	15	18	8					294933.9	6410893
Silicified tuff	Flake Shatter	18	11	5					294934.4	6410893
Silicified tuff	Flake Shatter	25	25	7					295017	6410974

Raw Material	Type	Length	Width	Thickness	Cortex	Core Blank	Number of Scars	Tool Type	XCOORD	YCOORD
Silcrete	Flake Shatter	48	36	20					294980.8	6409344
Silicified tuff	Flake Shatter	51	57	27					295178.5	6409230
Silicified tuff	Flake Shatter	29	21	10					295175.5	6409246
Silicified tuff	Flake Shatter	18	12	2					295177.4	6409253
Quartz	Flake Shatter	13	7	3					300570	6409950
Silcrete	Flake Shatter	48	18	13					299308.8	6412365
Silicified tuff	Flake Shatter	30	12	5					299246.4	6412430
Silicified tuff	Flake Shatter	47	20	11					298992.5	6409590
Silicified tuff	Flake Shatter	30	20	7					298993.5	6409642
Silcrete	Flake Shatter	12	9	2					299014.5	6409633
Silicified tuff	Flake Shatter	24	18	12					299004.8	6409648
Silcrete	Flake Shatter	25	28	13					299002.8	6409654
Silcrete	Complete Flake	15	11	3					299023.5	6409642
Silicified tuff	Flake Shatter	26	21	3					299026.2	6409643
Silicified tuff	Flake Shatter	30	16	7					299039.2	6409640
Silicified tuff	Flake Shatter	21	22	8					299043.5	6409642
Silicified tuff	Flake Shatter	18	28	6					299045.4	6409644
Silicified tuff	Flake Shatter	8	13	1					299027.6	6409657
Silcrete	Flake Shatter	34	32	11					298994.6	6409747
Silicified tuff	Flake Shatter	39	29	16					299003.4	6409858
Silcrete	Flake Shatter	66	61	14					299075.2	6409935
Silicified tuff	Flake Shatter	31	21	7					299154.8	6409989
Silicified tuff	Flake Shatter	34	26	9					299149.6	6409688
Silicified tuff	Flake Shatter	16	6	4					299146.8	6409674
Silcrete	Flake Shatter	18	15	3					299131.4	6409689
Silcrete	Flake Shatter	14	16	4					299127.8	6409686
Silcrete	Flake Shatter	20	10	5					299128.5	6409681
Quartz	Flake Shatter	21	14	6					299128.6	6409681
Silicified tuff	Flake Shatter	22	16	3					299128.2	6409680
Silicified tuff	Flake Shatter	38	18	9					299039.4	6409147
Silicified tuff	Flake Shatter	24	12	5					299201.5	6409024
Silicified tuff	Flake Shatter	15	19	4					299215.2	6409035

Raw Material	Type	Length	Width	Thickness	Cortex	Core Blank	Number of Scars	Tool Type	XCOORD	YCOORD
Silcrete	Flake Shatter	12	6	3					299169.4	6409022
Silicified tuff	Flake Shatter	18	15	4					299210.5	6409136
Silcrete	Flake Shatter	23	11	10					299190.1	6409156
Silicified tuff	Flake Shatter	35	26	15					299176.4	6409167
Silicified tuff	Flake Shatter	27	17	10					299155.4	6409215
Silicified tuff	Flake Shatter	17	11	3					299208.6	6409376
Silicified tuff	Flake Shatter	19	15	4					299199.2	6409656
Silicified tuff	Flake Shatter	27	16	5					299321.7	6409669
Silicified tuff	Flake Shatter	34	22	7					299327.5	6409189
Silicified tuff	Flake Shatter	31	22	6					299421.5	6408330
Silicified tuff	Flake Shatter	12	14	4					299420.8	6408330
Silcrete	Flake Shatter	31	25	20					299367.1	6408181
Silicified tuff	Flake Shatter	15	8	2					298341.7	6409040
Silicified tuff	Flake Shatter	15	20	3					298294	6409028
Silicified tuff	Flake Shatter	21	13	5					298296.3	6409033
Silicified tuff	Flake Shatter	36	31	6					298297.3	6409386
Silcrete	Flake Shatter	28	13	8					298558.8	6409689
Silicified tuff	Flake Shatter	16	19	5					298564.6	6409690
Silicified tuff	Flake Shatter	16	12	2					298564.2	6409690
Silicified tuff	Flake Shatter	34	26	14					298565.6	6409695
Silicified tuff	Flake Shatter	29	14	7					298551.4	6409712
Silcrete	Flake Shatter	16	19	3					298500.6	6409777
Silicified tuff	Flake Shatter	16	18	11					298533.9	6409291
Silicified tuff	Flake Shatter	27	21	19					298694.5	6409938
Silicified tuff	Flake Shatter	21	22	4					298684	6409966
Silicified tuff	Flake Shatter	27	19	7					298683.3	6409965
Silcrete	Flake Shatter	24	31	10					298645.3	6410091
Silicified tuff	Flake Shatter	39	28	10					298833.7	6410020
Silicified tuff	Flake Shatter	24	23	13					298851.2	6409570
Silicified tuff	Broken Fl (Proximal)	12	18	4					298137.7	6408726
Silicified tuff	Flake Shatter	27	20	7					298138.6	6408834
Silcrete	Flake Shatter	20	35	20					298138.4	6408839

Raw Material	Type	Length	Width	Thickness	Cortex	Core Blank	Number of Scars	Tool Type	XCOORD	YCOORD
Silicified tuff	Flake Shatter	37.8	35.7	14.9	No				297666	6408609
Silicified tuff	Flake Shatter	36.8	22.1	13.6	No				297721.5	6408679
Silicified tuff	Flake Shatter	30.4	19.9	7.2	No				297743.4	6408637
Silicified tuff	Flake Shatter	20	17	6	No				297726.8	6408494
Chert	Broken Fl (Proximal)	14.4	20	3.5	No				297757.7	6408423
Silcrete	Flake Shatter	17.9	29.5	8.5	No				297761.3	6408435
Silicified tuff	Flake Shatter	23	16	5	No				297883	6408313
Silicified tuff	Broken Fl (Proximal)	24	31	10	No				297883.7	6408313
Silicified tuff	Flake Shatter	24	19	7	No				297987	6408481
Silicified tuff	Flake Shatter	27	19	8	No				298006.7	6408572
Silcrete	Flake Shatter	31	27	12	No				298016.5	6408917
Silicified tuff	Flake Shatter	16	34	10					298015.3	6408930
Silcrete	Flake Shatter	15	16	5	No				298021.4	6408919
Silcrete	Flake Shatter	49	23	9	No				298038.1	6408916
Silcrete	Flake Shatter	87	70	27	No				298083.7	6408907
Quartz	Flake Shatter	18	15	5					298116.6	6408864
Silicified tuff	Flake Shatter	19	15	6	No				298121.8	6408858
Chert	Flake Shatter	18	15	3					298124.7	6408858
Quartzite	Flake Shatter	46	27	10					298133.6	6408846
Silcrete	Flake Shatter	23	28	5					298133	6408843
Silcrete	Flake Shatter	19	25	5					298134.4	6408841
Silcrete	Flake Shatter	55	32	16					298133.7	6408841
Silicified tuff	Flake Shatter	24	25	6					298124.7	6408840
Silcrete	Flake Shatter	45	48	15					298117.7	6408844
Silicified tuff	Flake Shatter	31	18	5					298112.3	6408835
Silcrete	Flake Shatter	18	20	10					298111.6	6408834
Silicified tuff	Flake Shatter	35	16	7					298073.4	6408830
Silcrete	Flake Shatter	39	22	9					298107.8	6408821
Silcrete	Flake Shatter	32	38	19					298127.7	6408819
Silcrete	Flake Shatter	27	21	8					298131.4	6408825
Chert	Flake Shatter	20	23	10					298126.4	6408816
Silicified tuff	Flake Shatter	26	21	6					298125.5	6408805

Raw Material	Type	Length	Width	Thickness	Cortex	Core Blank	Number of Scars	Tool Type	XCOORD	YCOORD
Silicified tuff	Flake Shatter	34	27	9					298095.9	6408796
Silicified tuff	Flake Shatter	36	20	10	Yes				298090.3	6408721
Silicified tuff	Flake Shatter	12	22	5					298125.2	6408679
Silicified tuff	Flake Shatter	24	15	5					298078.3	6408651
Silicified tuff	Flake Shatter	16	11	3					298107.1	6408477
Chert	Flake Shatter	19	16	19					298036.5	6408446
Silicified tuff	Broken Fl (Proximal)	31	24	11					298034.4	6408428
Silicified tuff	Flake Shatter	18	15	6					298062.9	6408379
Silicified tuff	Flake Shatter	31	23	17					298058.9	6408369
Silicified tuff	Flake Shatter	30	18	20					298167.3	6408411
Silicified tuff	Flake Shatter	15	14	3					298115.6	6408376
Silicified tuff	Flake Shatter	30	26	7					298118.9	6408371
Silicified tuff	Flake Shatter	40	31	9					298083.6	6408341
Silicified tuff	Broken Fl (Proximal)	32	30	7					298146.3	6408287
Silcrete	Flake Shatter	47	40	17					298146.9	6408285
Silcrete	Flake Shatter	40	21	11					298140.9	6408266
Chert	Flake Shatter	39	24	16					298141	6408266
Silicified tuff	Flake Shatter	45	15	9					298139.4	6408267
Silicified tuff	Flake Shatter	12	27	6					298138.7	6408266
Silicified tuff	Flake Shatter	31	29	13					298140.1	6408262
Quartz	Flake Shatter	20	19	6					298112.1	6408274
Silicified tuff	Flake Shatter	29	21	7					298112.3	6408274
Silicified tuff	Flake Shatter	18	23	9					298110.3	6408268
Silicified tuff	Flake Shatter	27	22	12					298116.6	6408255
Silicified tuff	Flake Shatter	17	43	8					298126.8	6408244
Silicified tuff	Flake Shatter	15	20	4					298124.8	6408218
Silicified tuff	Flake Shatter	40.6	34	15.8	No				297334.8	6408108
Silicified tuff	Flake Shatter	37	22.5	11.67	Yes				297314.8	6408120
Silicified tuff	Flake Shatter	47.1	21.8	7.2	No				297295.4	6408114
Silicified tuff	Flake Shatter	30.6	20	6.3					297296.2	6408114
Silicified tuff	Flake Shatter	27.9	20.3	8.8					296769.1	6408303
Silicified tuff	Broken Fl (Proximal)	12.7	15.3	2.5	No				297318.2	6408381

Raw Material	Type	Length	Width	Thickness	Cortex	Core Blank	Number of Scars	Tool Type	XCOORD	YCOORD
Silicified tuff	Flake Shatter	32.3	21.3	6.7	No				297355.9	6408192
Silicified tuff	Flake Shatter	18.9	24.7	7.7	Yes				297355.5	6408192
Silicified tuff	Flake Shatter	6.5	9	2.3	No				297329.6	6408182
Silicified tuff	Flake Shatter	14.3	17.5	5.1	No				297355.5	6408137
Silcrete	Flake Shatter	20.3	21.9	5.4					297353	6408136
Silicified tuff	Flake Shatter	34.5	29.1	10.6	Yes				297352.5	6408125
Chert	Flake Shatter	28.4	13.4	3.4					297349.3	6408103
Silicified tuff	Flake Shatter	27.2	21.3	9.3					297560	6407956
Silicified tuff	Flake Shatter	17	12	6	No				297539.4	6407938
Silicified tuff	Flake Shatter	39	22	8					297539.2	6407938
Silicified tuff	Flake Shatter	11	11	4	No				297538.5	6407936
Silcrete	Flake Shatter	24	23	12	No				297403.5	6408021
Silicified tuff	Flake Shatter	25.9	15.8	7.8					297765.9	6408441
Silicified tuff	Flake Shatter	31.9	19.7	10.1	No				297300.3	6408102
Silicified tuff	Retouched Flake	36	31	13					298869.2	6409693
Silicified tuff	Retouched Flake	63	53	22				Scraper	299145.8	6410032
Silicified tuff	Retouched Flake	42	23	16					299132.9	6409951
Silicified tuff	Retouched Flake	60	30	10					299104.9	6408994
Silicified tuff	Split Flake	19	15	6					298351.4	6408180
Porcellanite	Broken Fl (Proximal)	32	13	3					301928.7	6414602
Porcellanite	Broken Fl (Proximal)	12	9	3					301932.3	6414598
Porcellanite	Broken Fl (Proximal)	20	5	5					301934.1	6414597
Porcellanite	Broken Fl (Proximal)	10	10	2					301936.2	6414592
Silcrete	Broken Fl (Proximal)	25	40	18					294804	6409755
Silcrete	Split Flake	39	24	12					299002.2	6409633
Silicified tuff	Broken Fl (Proximal)	14	23	5					299005.4	6409650
Silicified tuff	Broken Fl (Proximal)	19	19	5					298138	6408842
Silicified tuff	Broken Fl (Proximal)	19	18	5					298137.8	6408842
Silicified tuff	Split Flake	26	43	20					298437.8	6407952
Silcrete	Broken Fl (Proximal)	24	26	6	Yes				298059	6408898
Silicified tuff	Complete Flake	31	40	11					298121.3	6408217
Silicified tuff	Complete Flake	29	32	8					298062.4	6408259

Raw Material	Type	Length	Width	Thickness	Cortex	Core Blank	Number of Scars	Tool Type	XCOORD	YCOORD
Silicified tuff	Split Flake	20.7	12.6	7.9	No				297316.6	6408120

Appendix L

Site Cards

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5850 **Date recorded:** 19-11-2018

Site Location Information

Site name: MP-IA21-18

Easting: 299125 **Northing:** 6412648 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 3

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

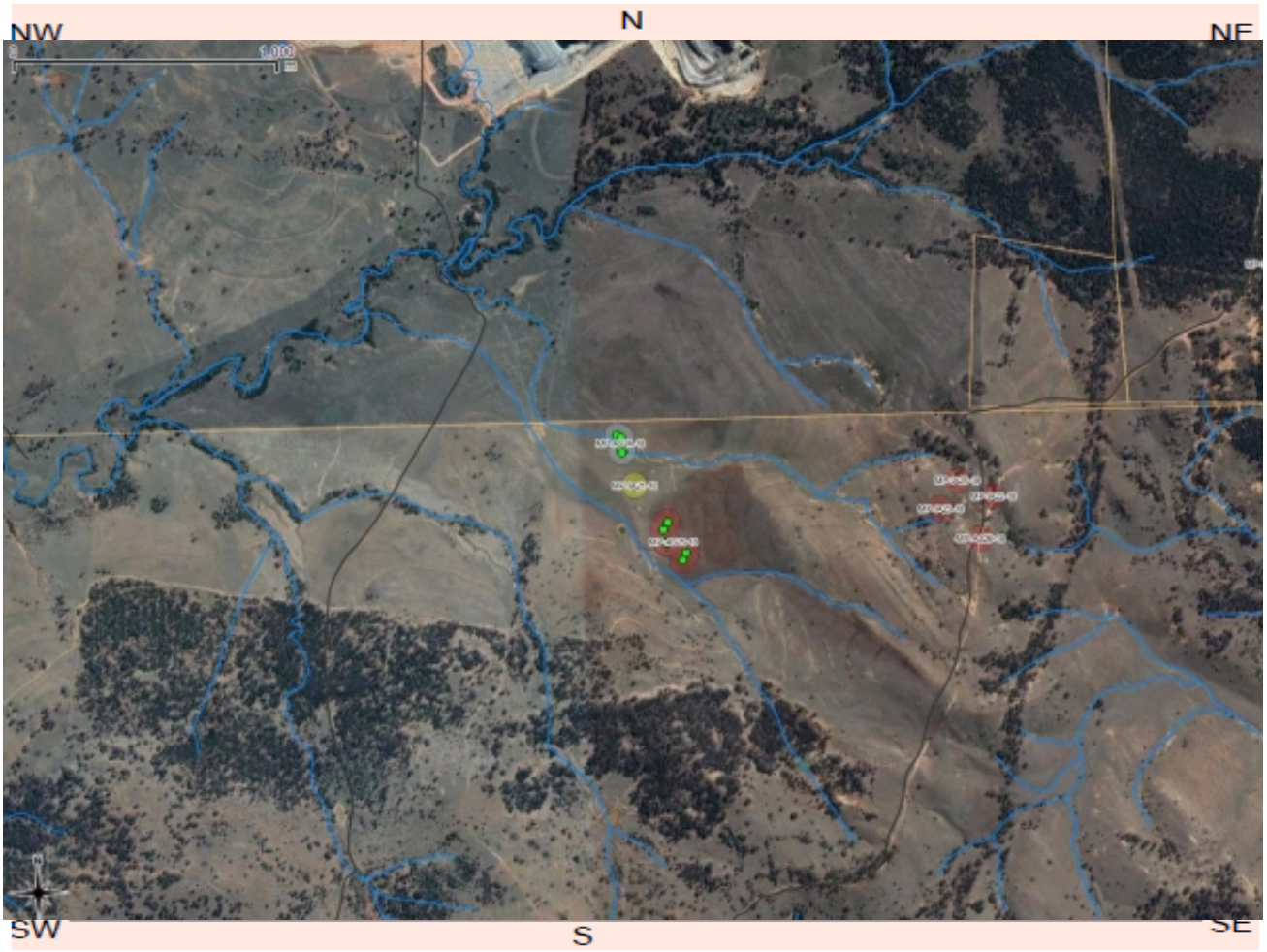
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 170 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 3.6 km east of Edderton Road.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x silcrete chopper.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

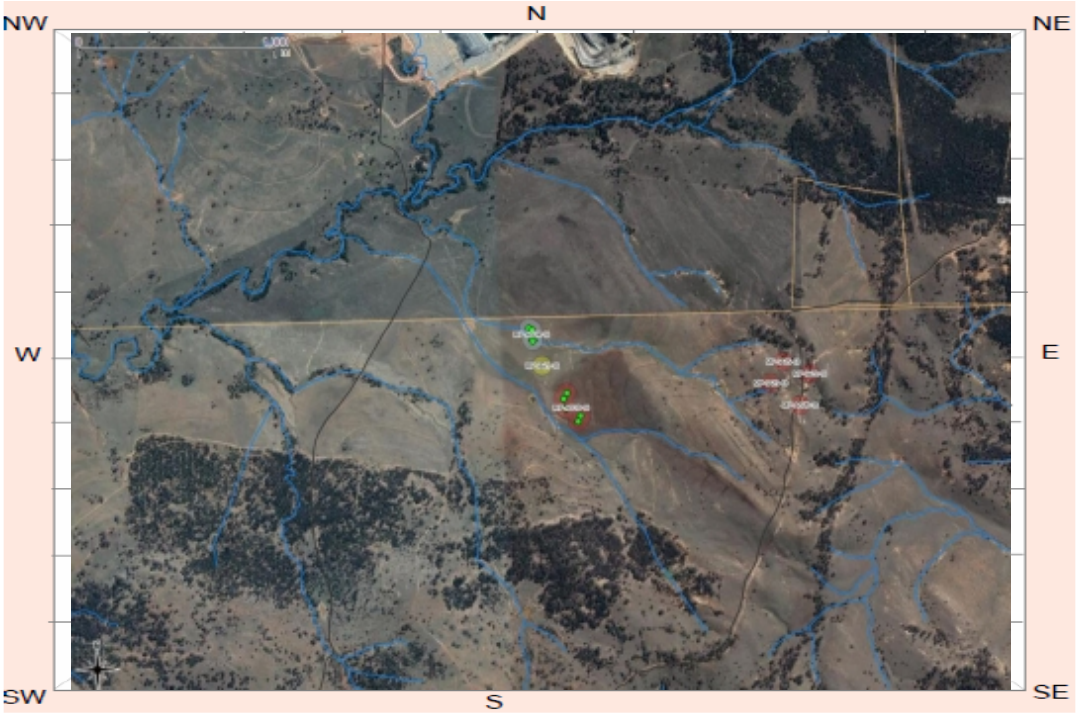
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Site location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5851 **Date recorded:** 19-11-2018

Site Location Information

Site name: MP-IA22-18

Easting: 300488 **Northing:** 6412607 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 3

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

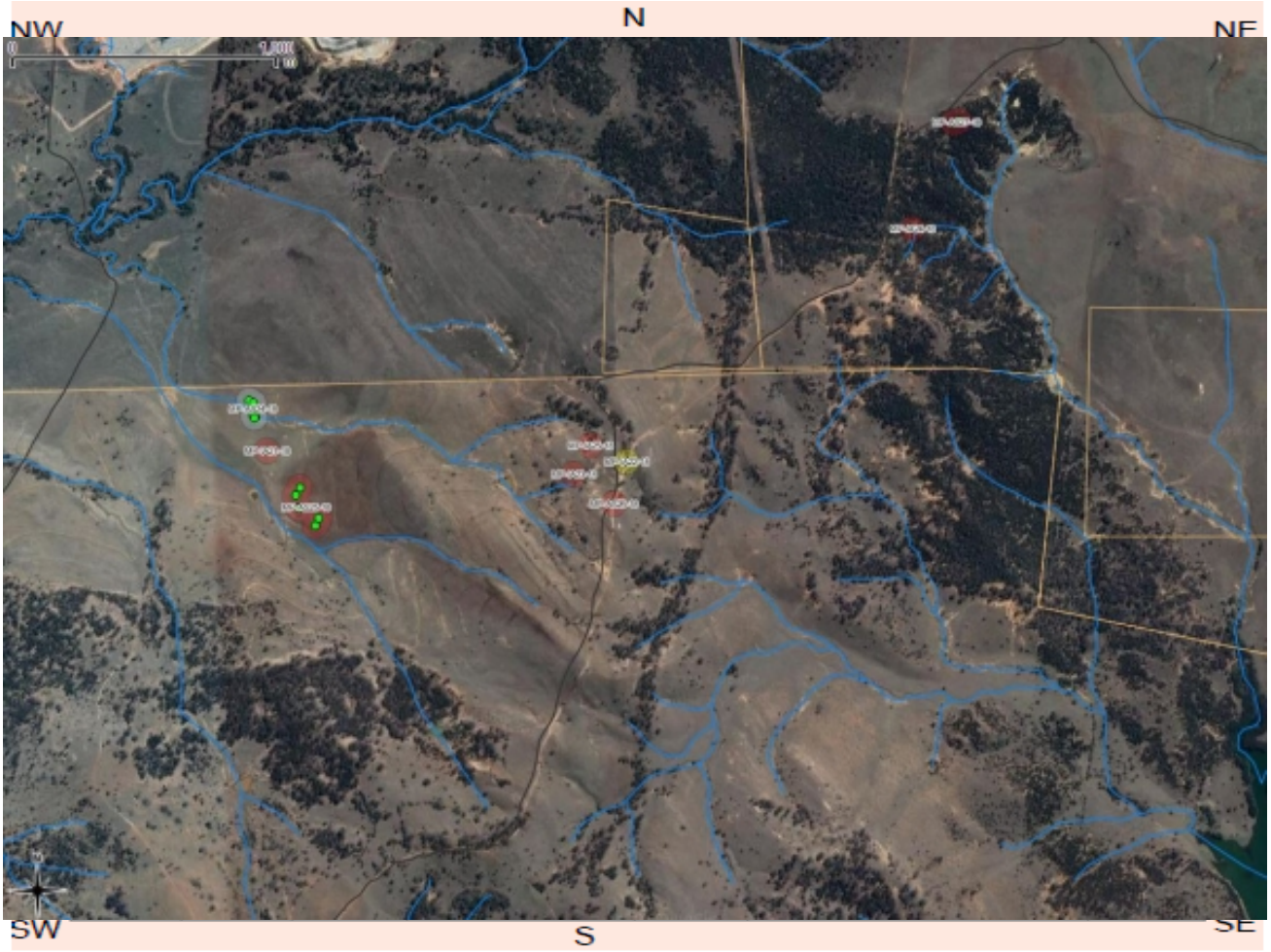
Land Form Unit: Crest **Vegetation:** Cleared

Distance to Water (m): 360 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 2.2 km east of Edderton Road.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x quartzite complete flake

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

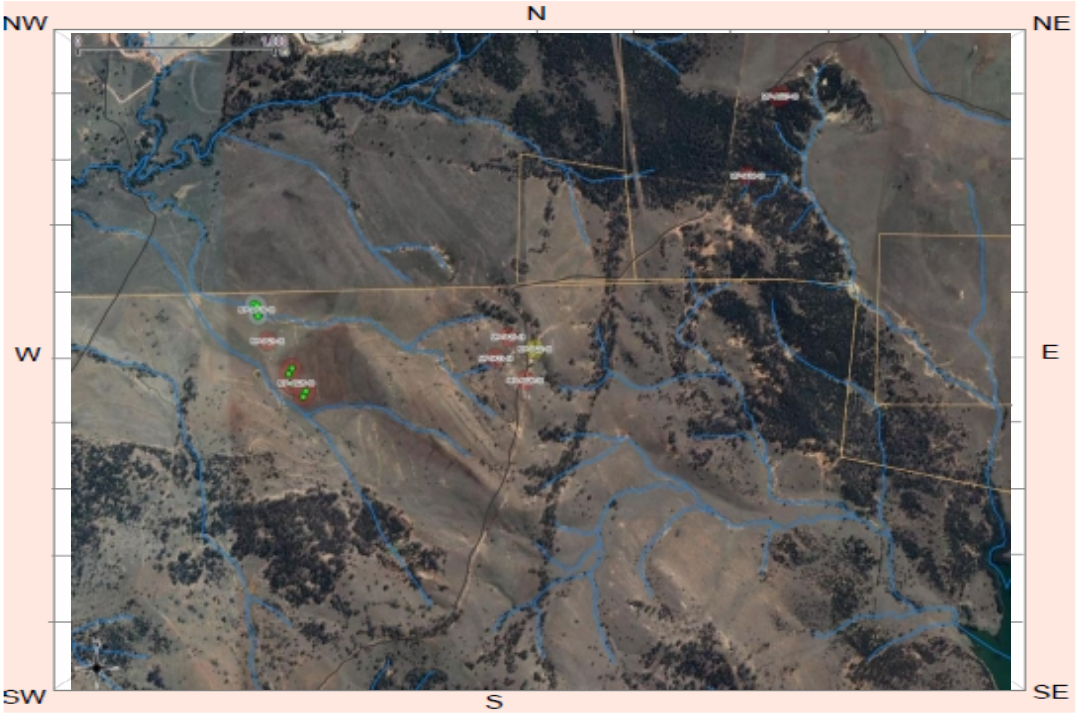
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Site location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5852 **Date recorded:** 19-11-2018

Site Location Information

Site name: MP-IA23-18

Easting: 300289 **Northing:** 6412559 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 3

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

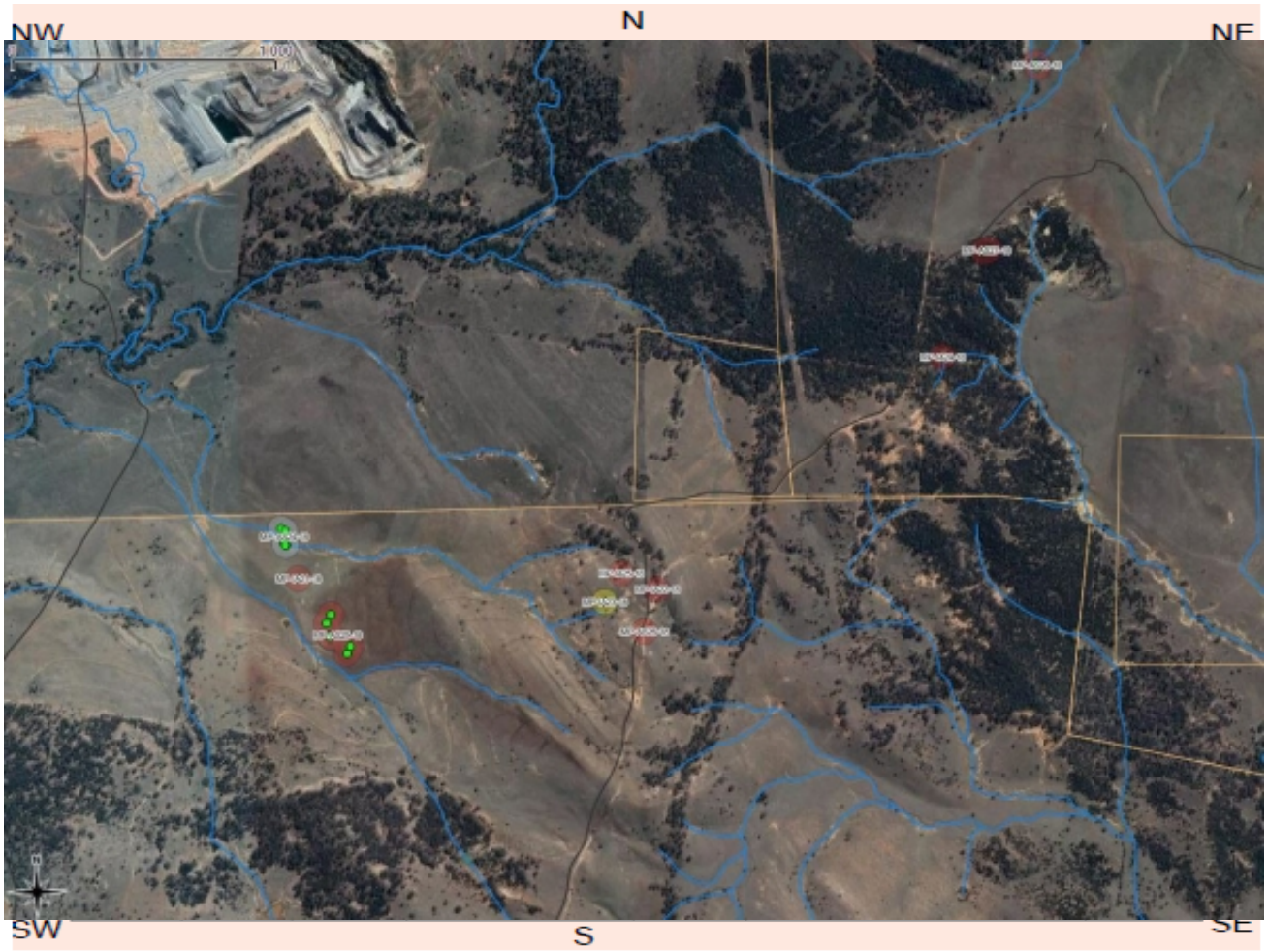
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 260 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 5 km east of Edderton Road.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x tuff complete flake

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

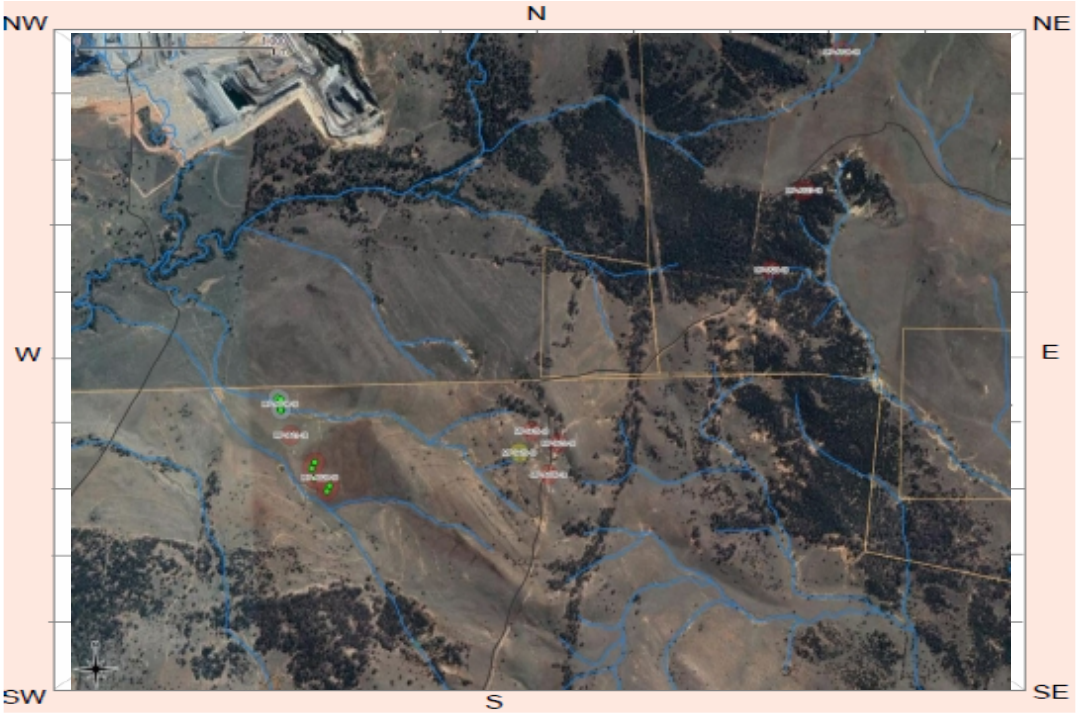
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Site location

Description:

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5853 **Date recorded:** 19-11-2018

Site Location Information

Site name: MP-IA25-18

Easting: 300351 **Northing:** 6412668 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 3

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

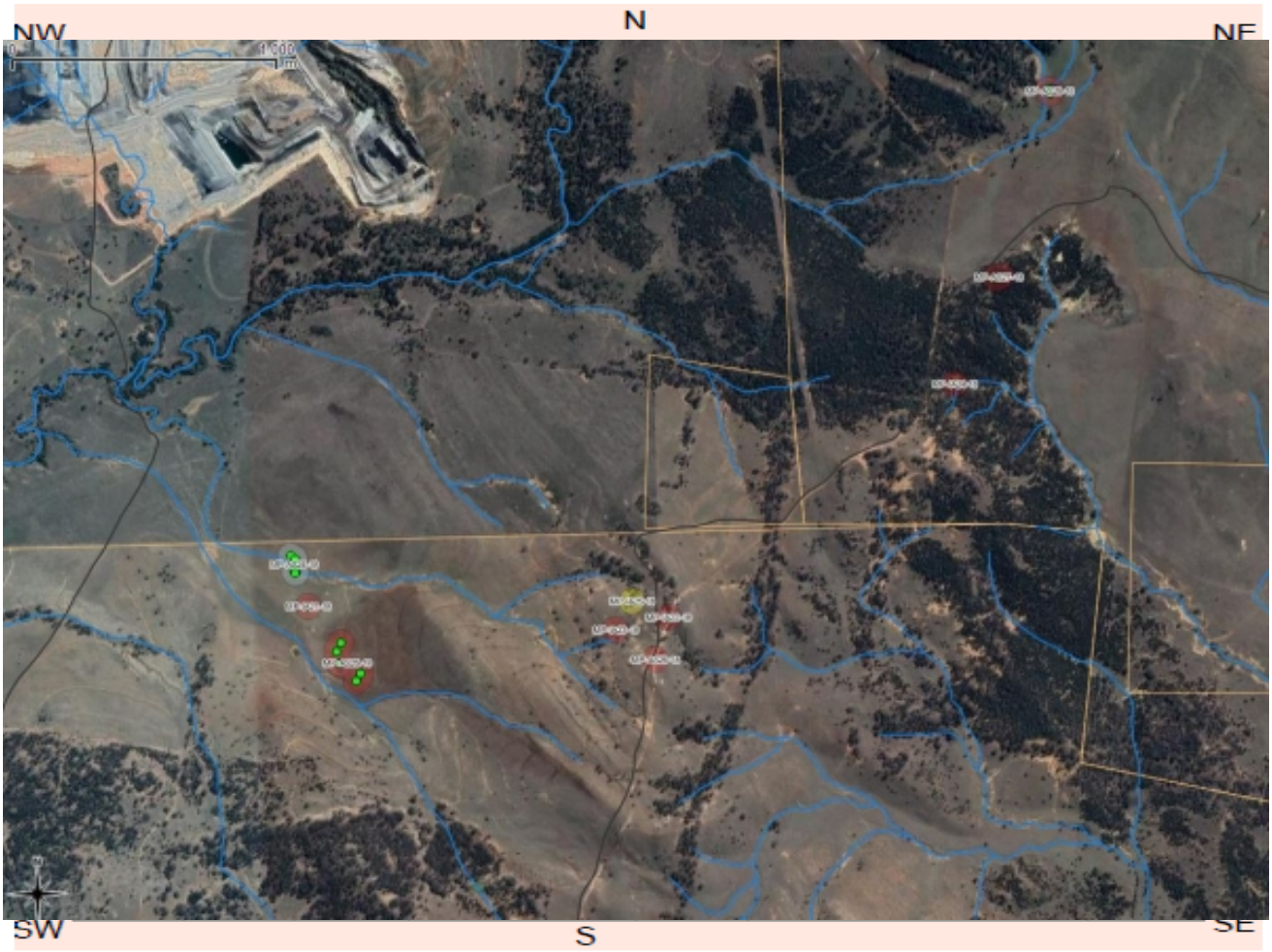
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 360 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 2.6 km south of Drayton Mine (Maxwell).

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Poor

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x tuff complete flake

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

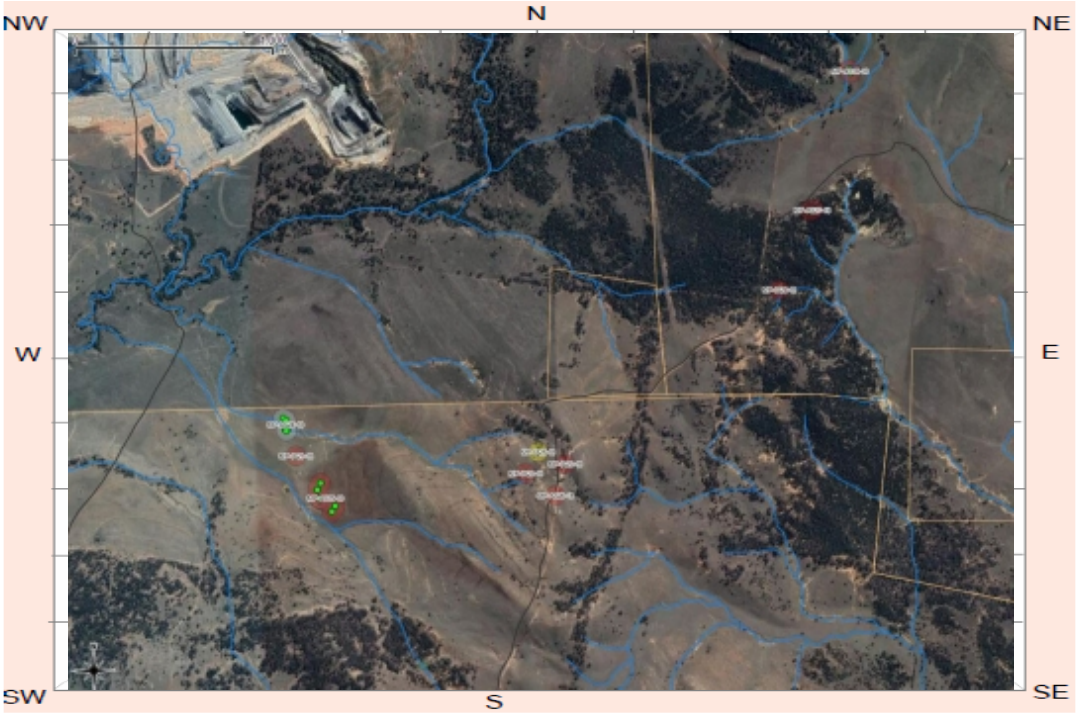
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Site location

Description:

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5854 **Date recorded:** 19-11-2018

Site Location Information

Site name: MP-IA24-18

Easting: 301572 **Northing:** 6413490 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 3

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

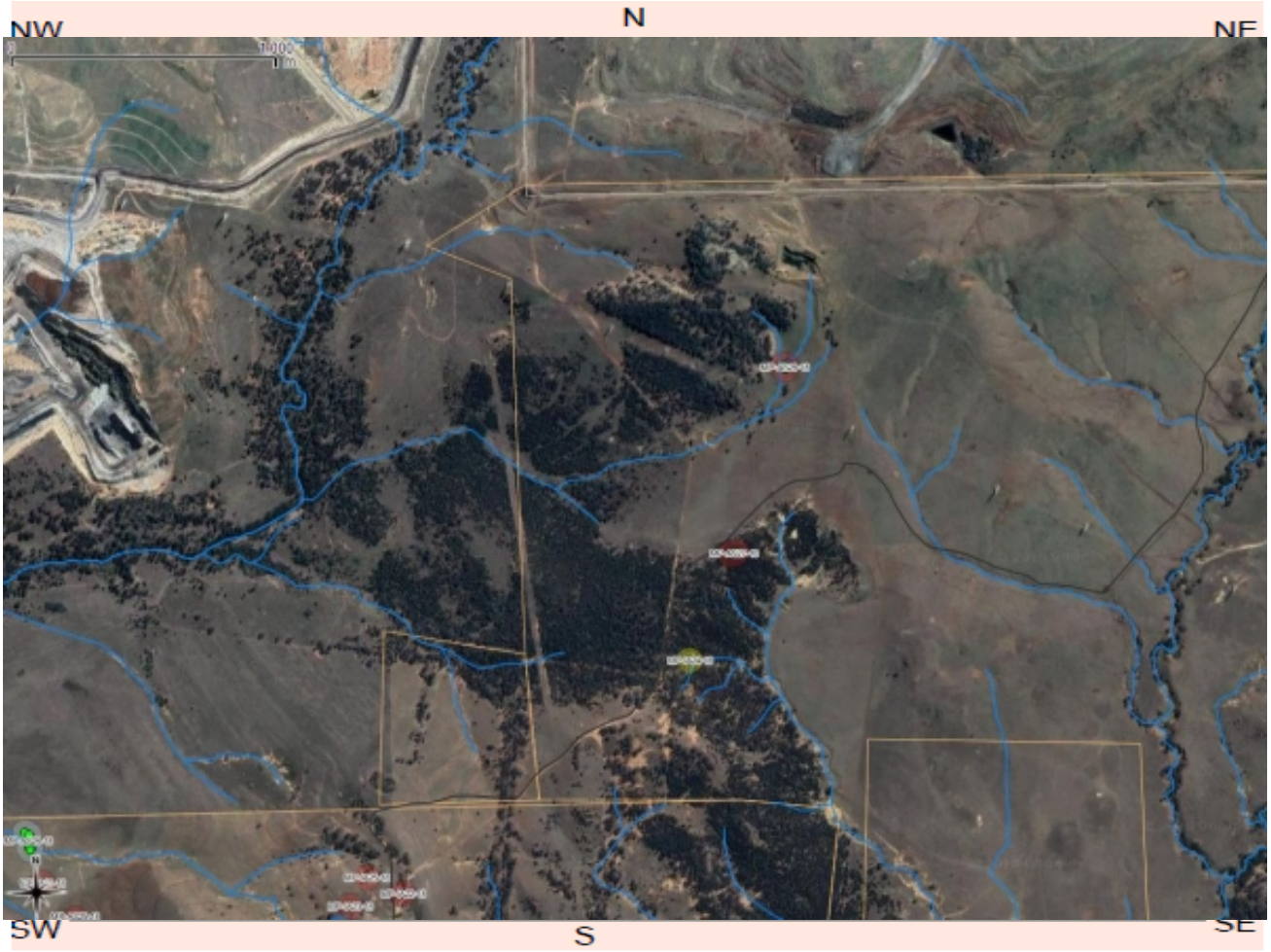
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 20 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 1.8 km south of Drayton Mine (Maxwell).

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x tuff complete flake

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

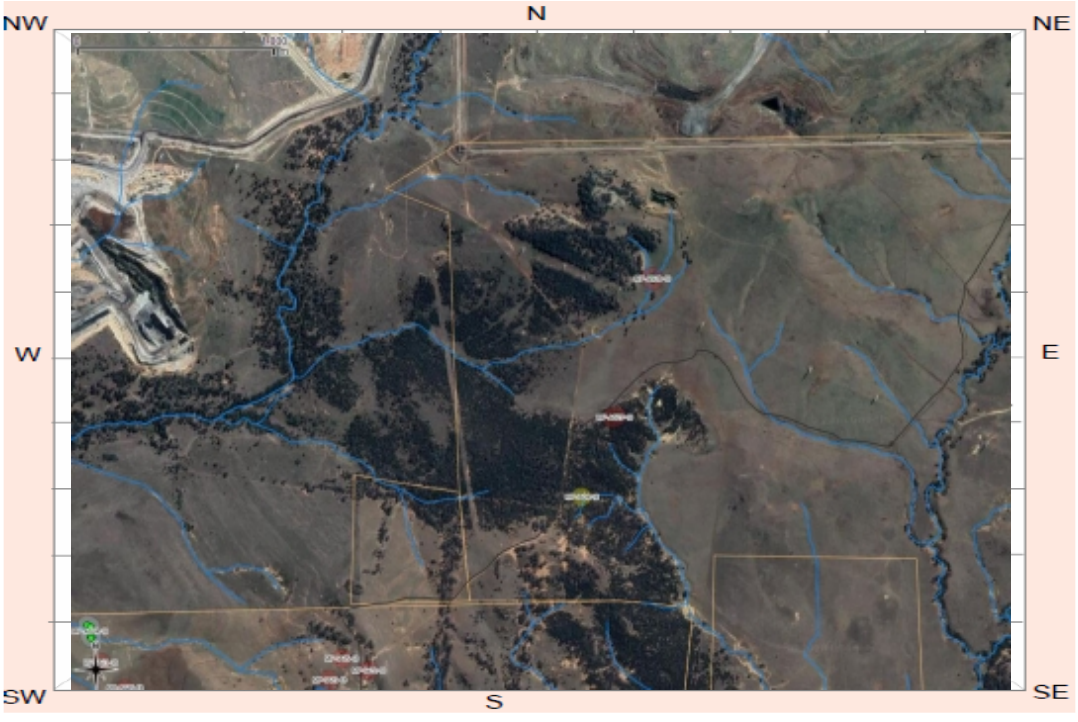
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Site location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5861 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-IA5-18

Easting: 295245 **Northing:** 6409343 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title Mr. **Surname** Oakes **First name** Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

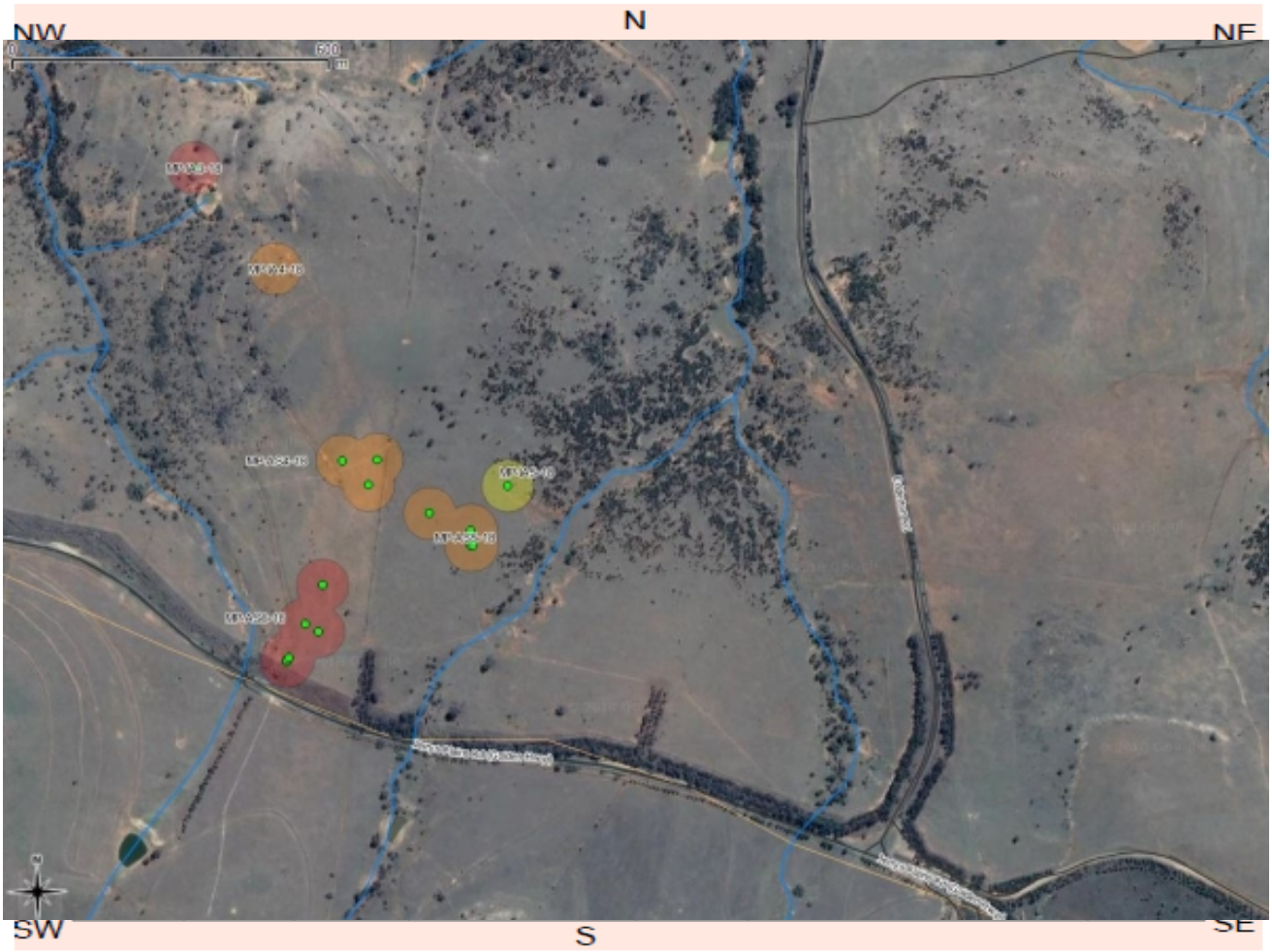
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 125 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 510m north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x FGS axe/chopper

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

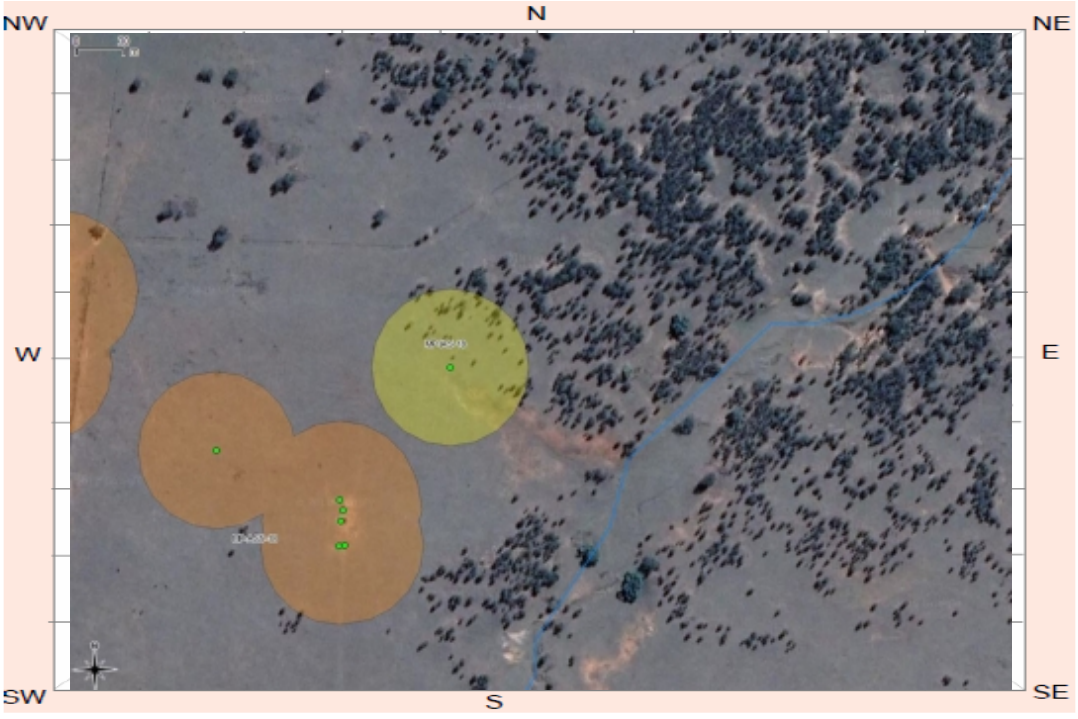
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefact location

Description:

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5862 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS29-18

Easting: 299070 **Northing:** 6409642 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

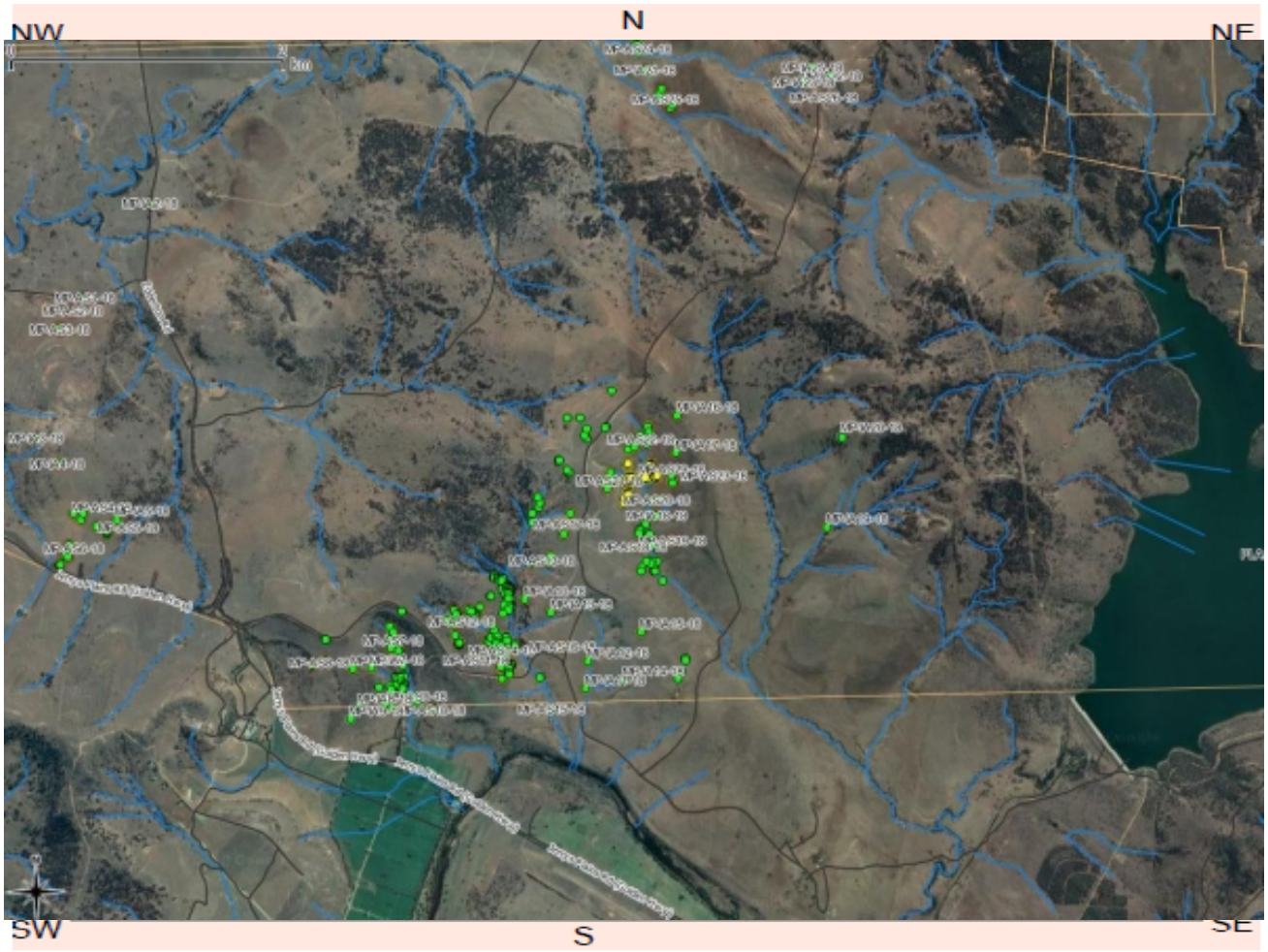
Land Form Unit: Flat **Vegetation:** Cleared

Distance to Water (m): 0 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 2.8 km north of the Golden Highway

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	78	340	220				

Description:

Artefact scatter comprising 44 x complete flakes, 20 x flake shatter fragments, 8 x angular shatter fragments, 3 cores, 2 x axes, and 1 x split flake.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

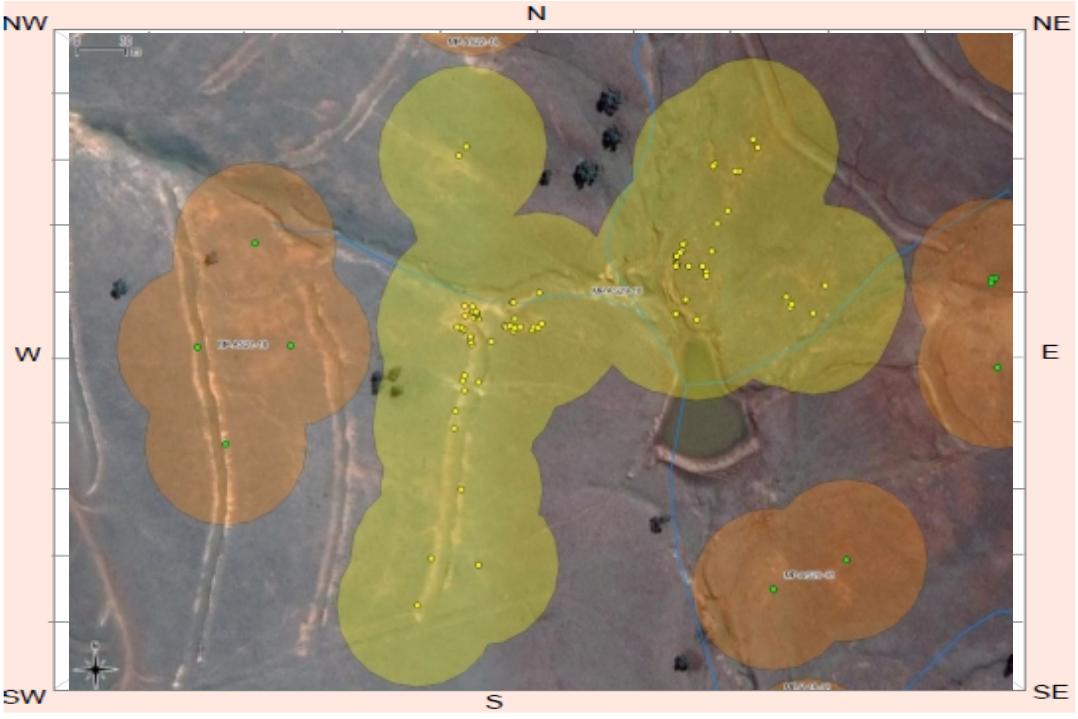
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Site location



Description: Site location



Description: Sample artefact (axe)

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5863 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS24-18

Easting: 299067 **Northing:** 6412814 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

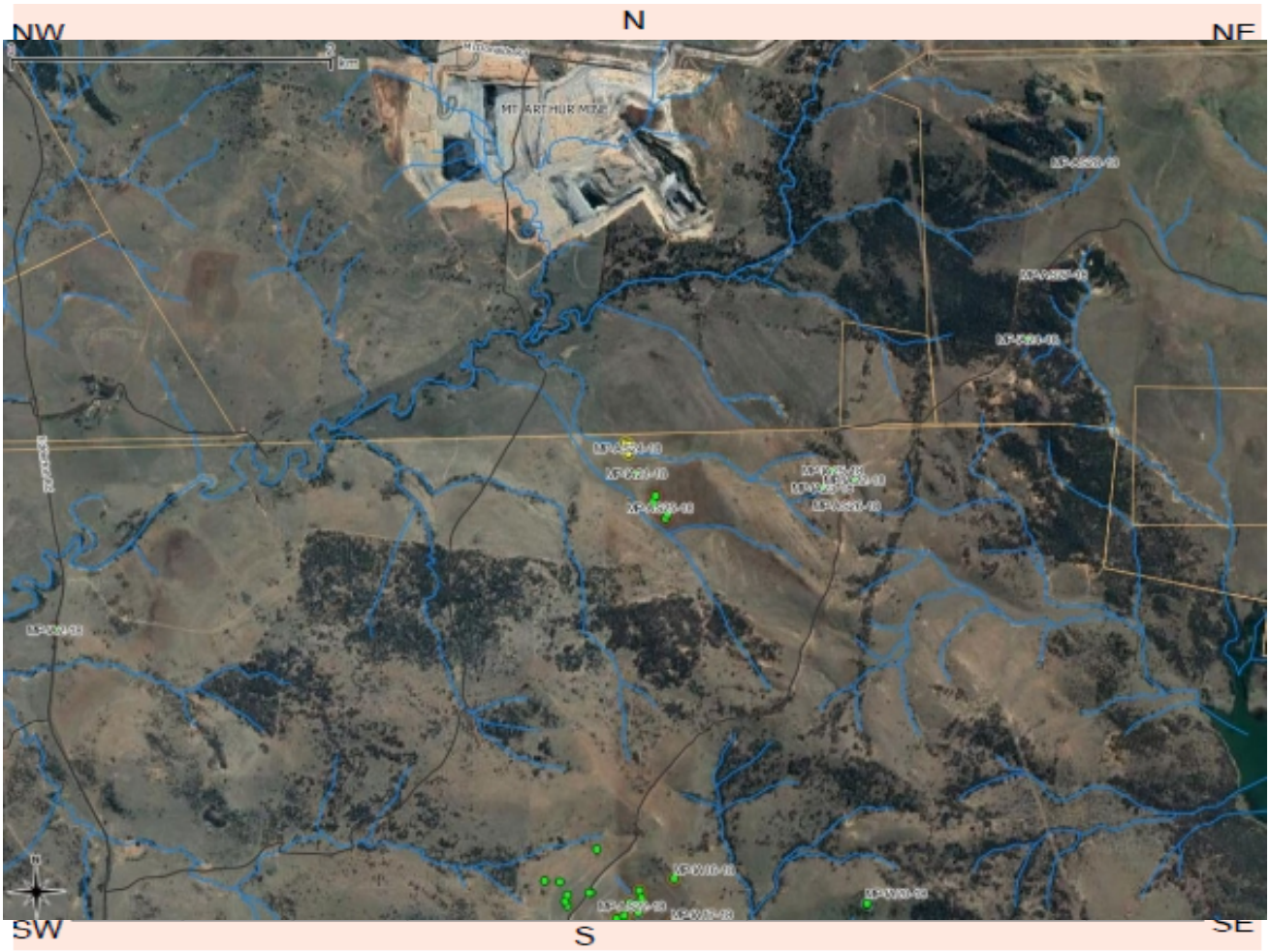
Land Form Unit: Flat **Vegetation:** Cleared

Distance to Water (m): 0 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 3.6 km east of Edderton Road.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	5	70	15				

Description:

Artefact scatter comprising 3 x complete flakes and 2 x silcrete/tuff unidirectional cores.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Sample artefact



Description: Site location

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5864 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS23-18

Easting: 299324 **Northing:** 6409645 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

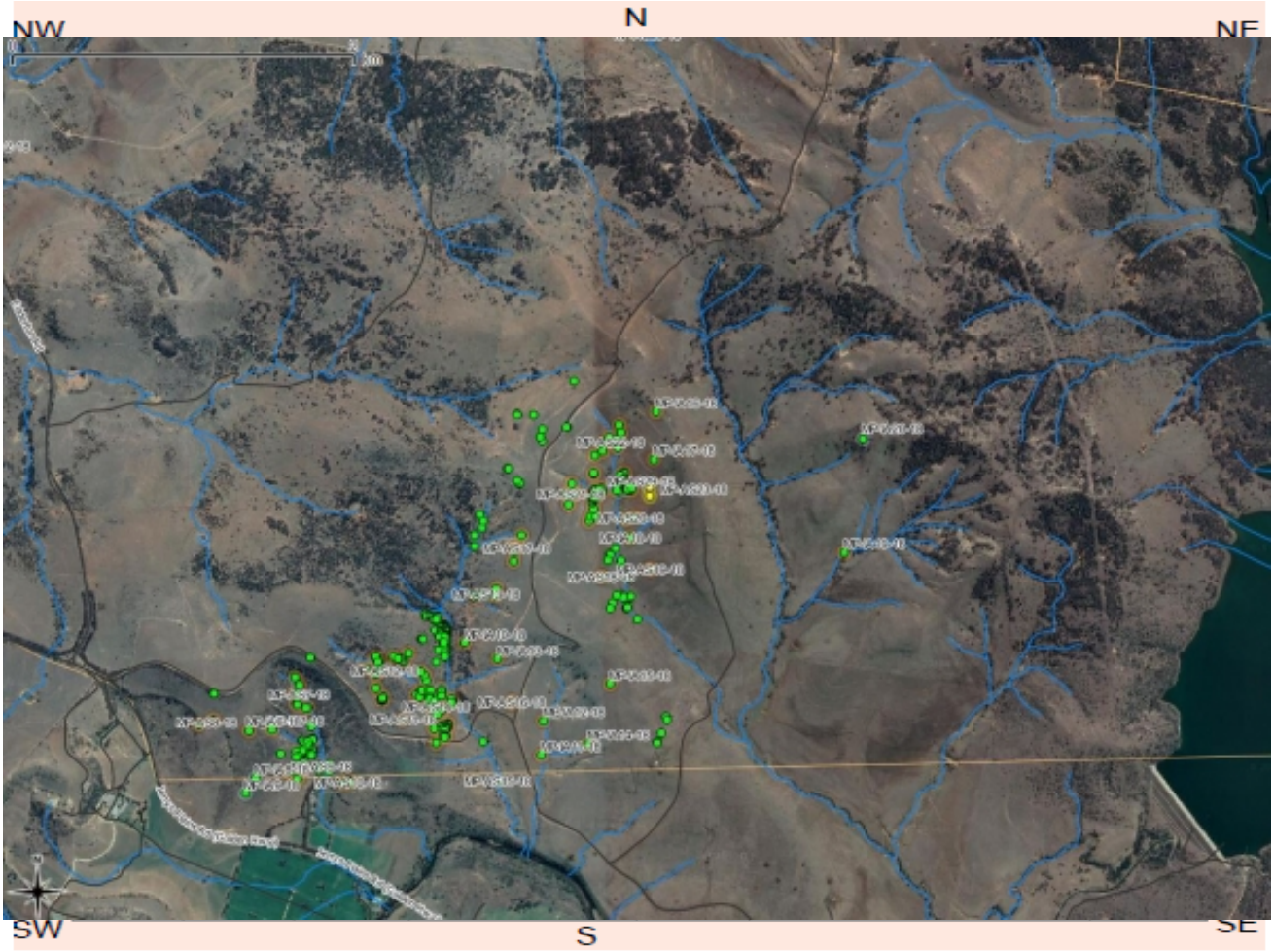
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 40 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 3.1 km north of the Hunter River.

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	4	50	10				

Description:

Artefact scatter comprising 2 x complete flakes, 1 x quartz bidirectional core, and 1 x flake shatter fragment.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

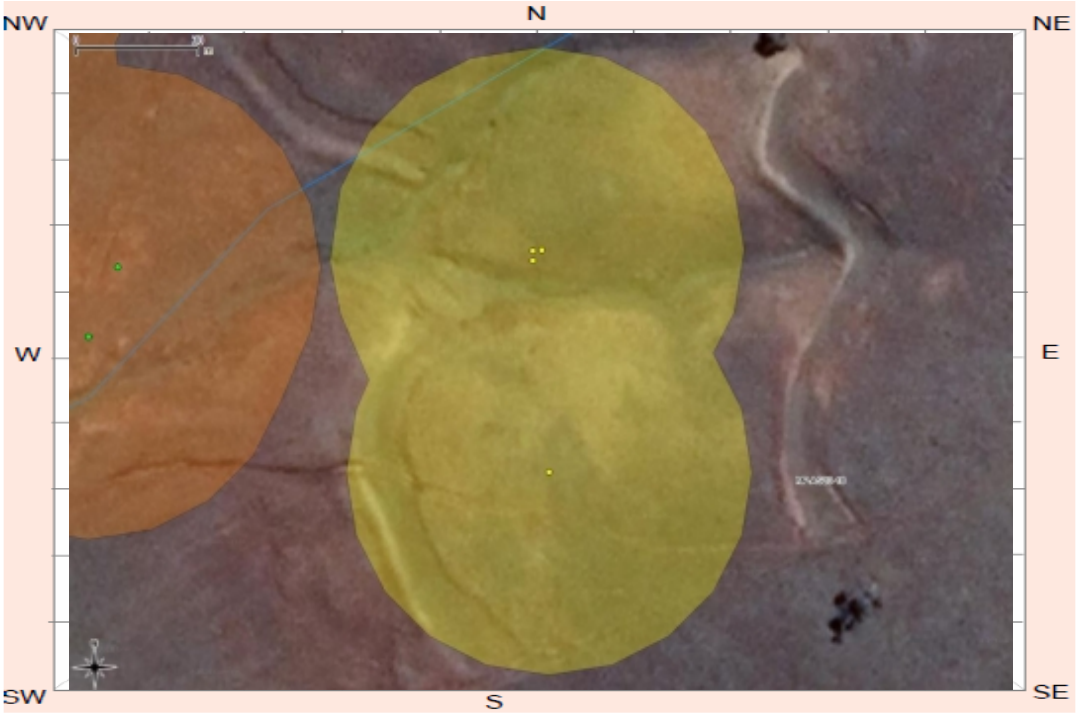
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info:

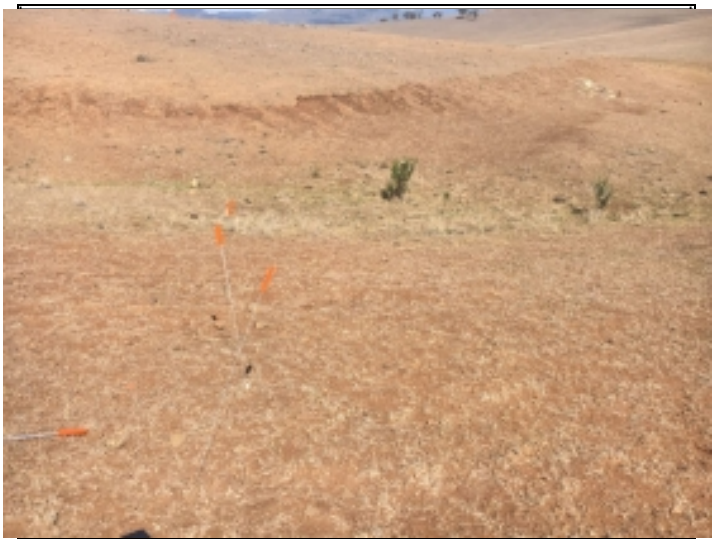
Site plan



Site photographs



Description: Sample artefact



Description: Site location

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5865 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS22-18

Easting: 299095 **Northing:** 6409935 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title Mr. **Surname** Oakes **First name** Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

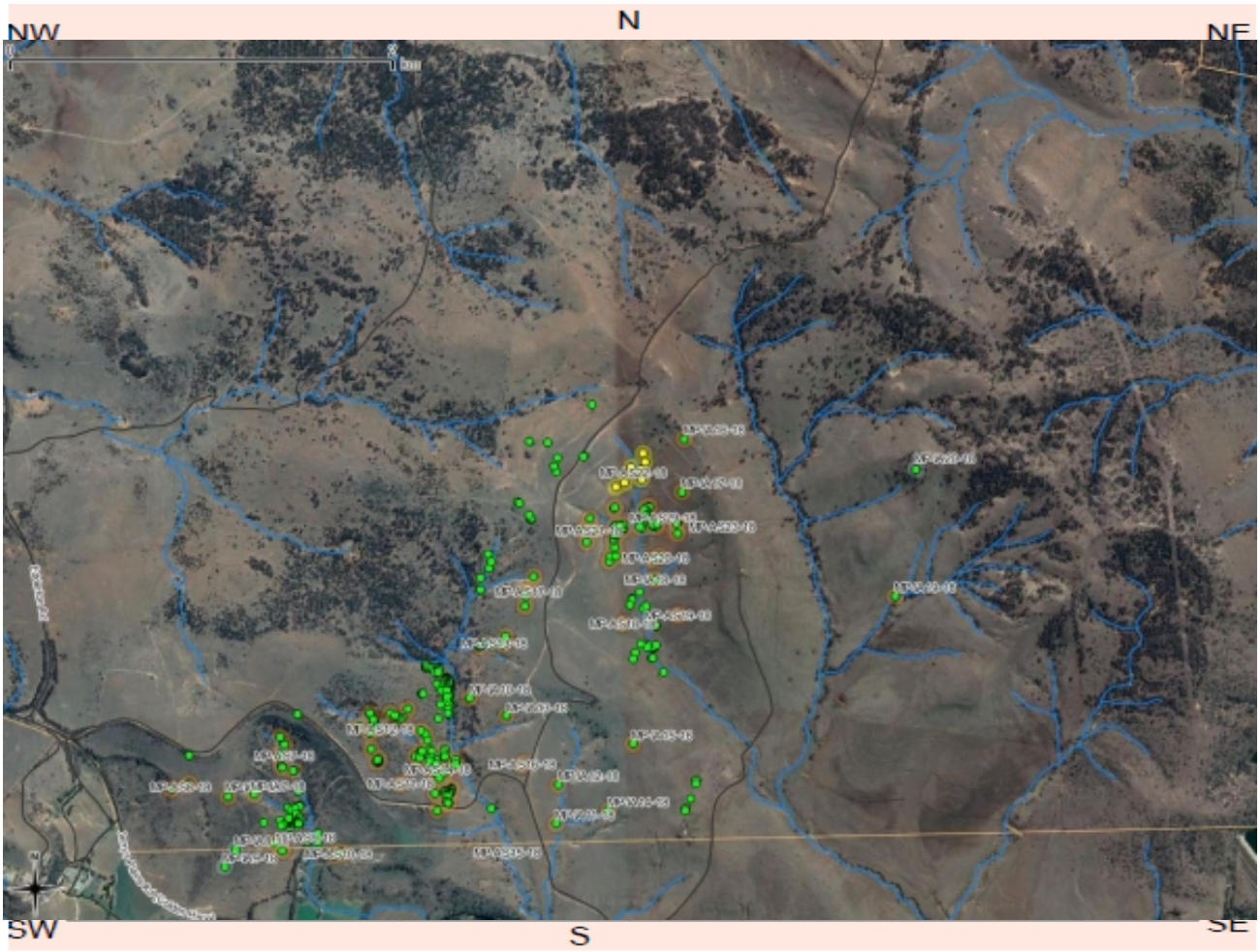
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 0 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 2.5 km north of the Hunter River.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	9	220	80				

Description:

Artefact scatter comprising 3 x complete flakes, 3 x flake shatter fragments, 2 x tuff retouched flakes, and 1 silcrete angular shatter fragment.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

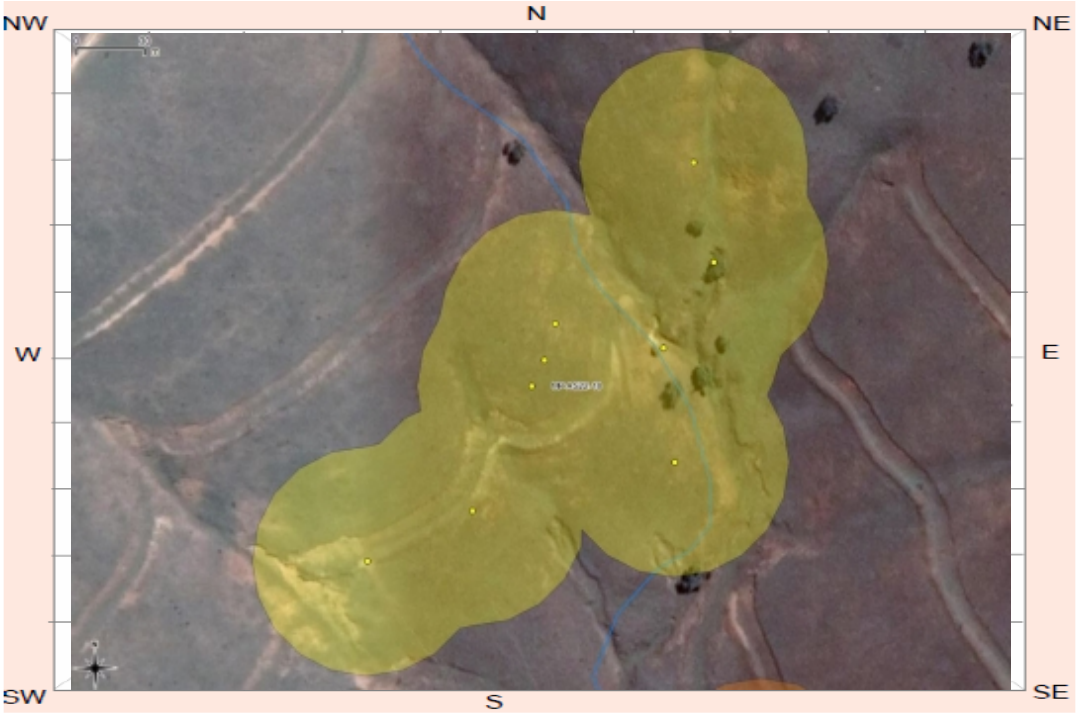
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Sample artefact



Description: Site location

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5866 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS21-18

Easting: 298862 **Northing:** 6409631 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

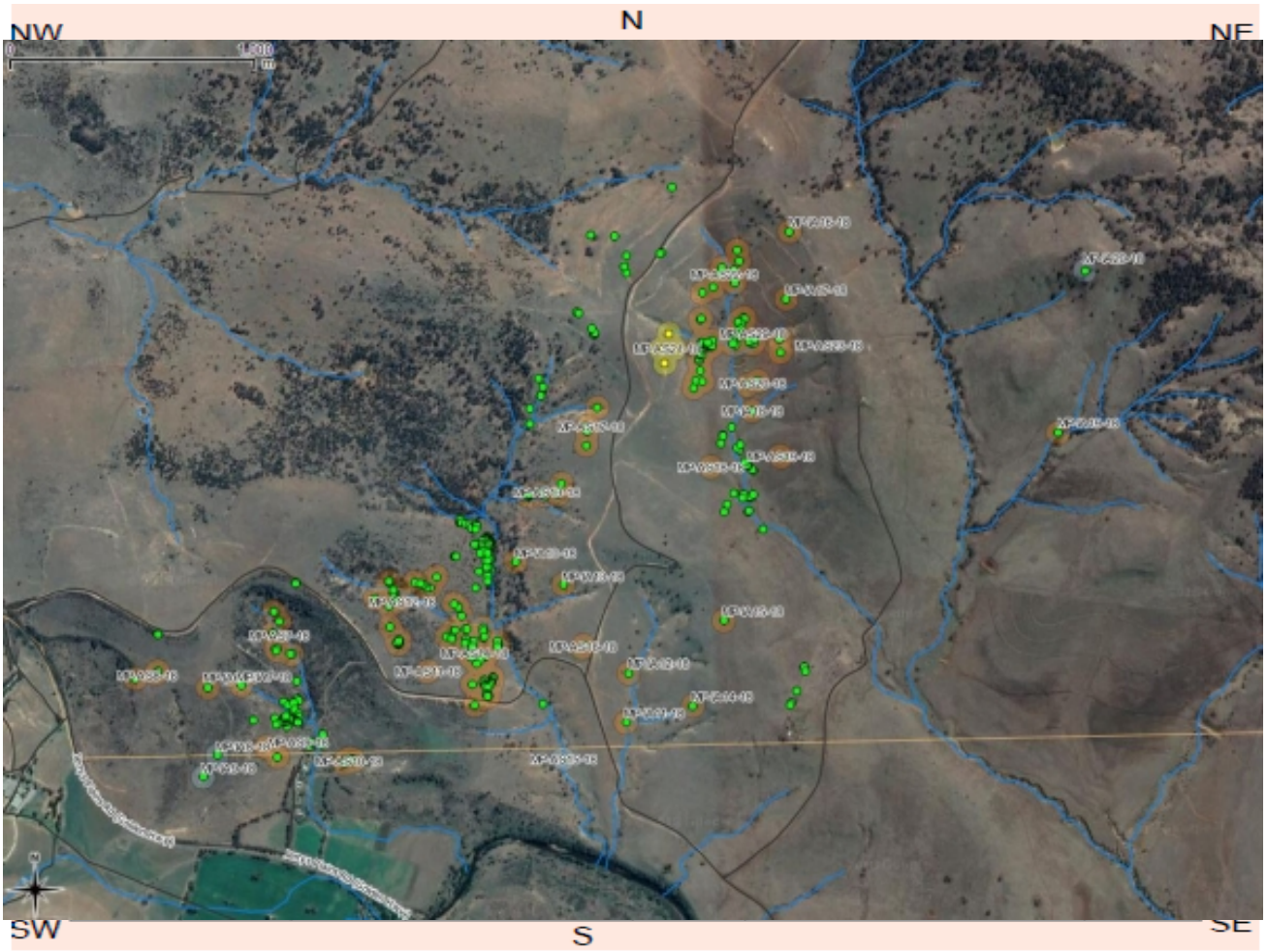
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 10 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 2 km north of the Hunter River.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	4	125	60				

Description:

Artefact scatter comprising 1 x tuff retouched flake, 1 x silcrete split flake, 1 x flake shatter fragment, 1 x tuff core fragment.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

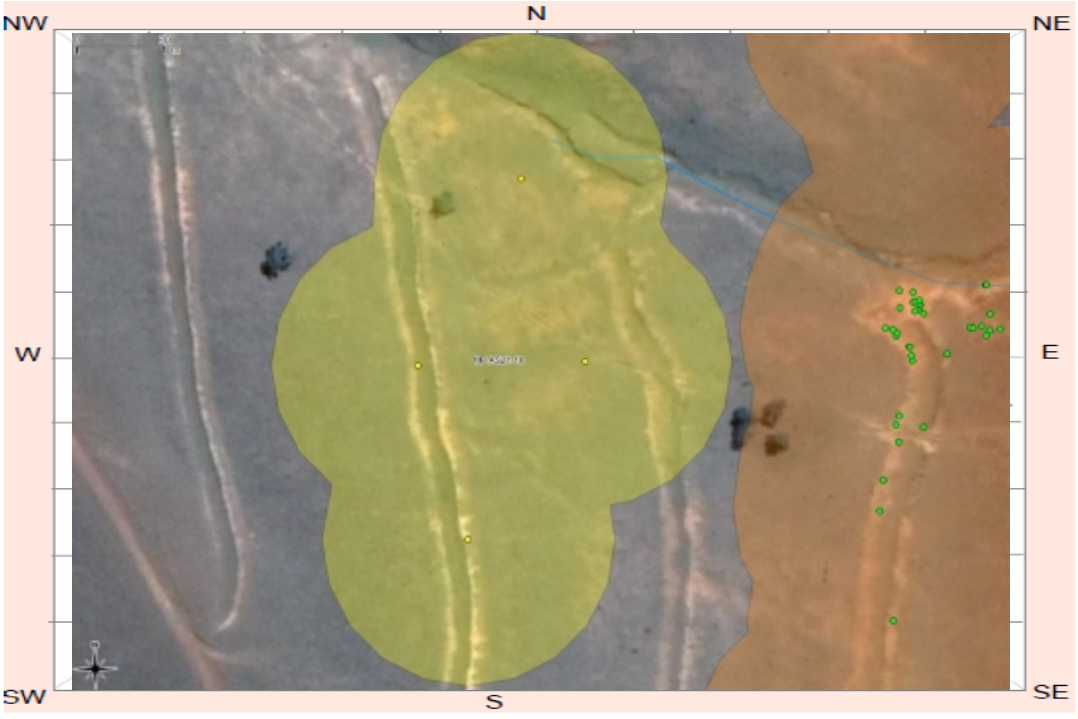
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Site location



Description: Retouched flake (scapper)

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5867 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS20-18

Easting: 299210 **Northing:** 6409490 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

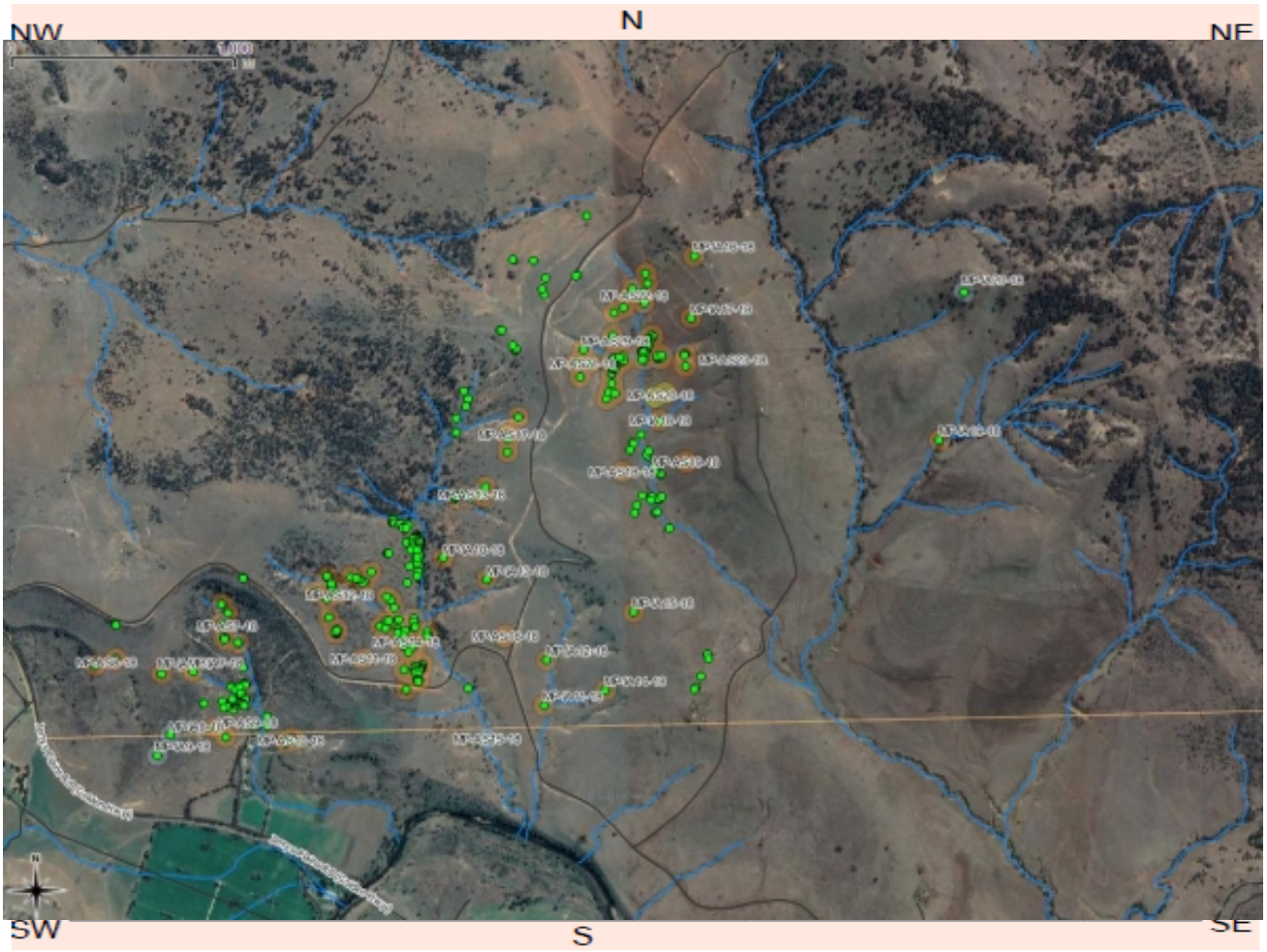
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 40 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 2.1 km north of the Hunter River.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
1.	Artefact	2	50	2				

Description:

Artefact scatter comprising 2 x tuff complete flakes

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

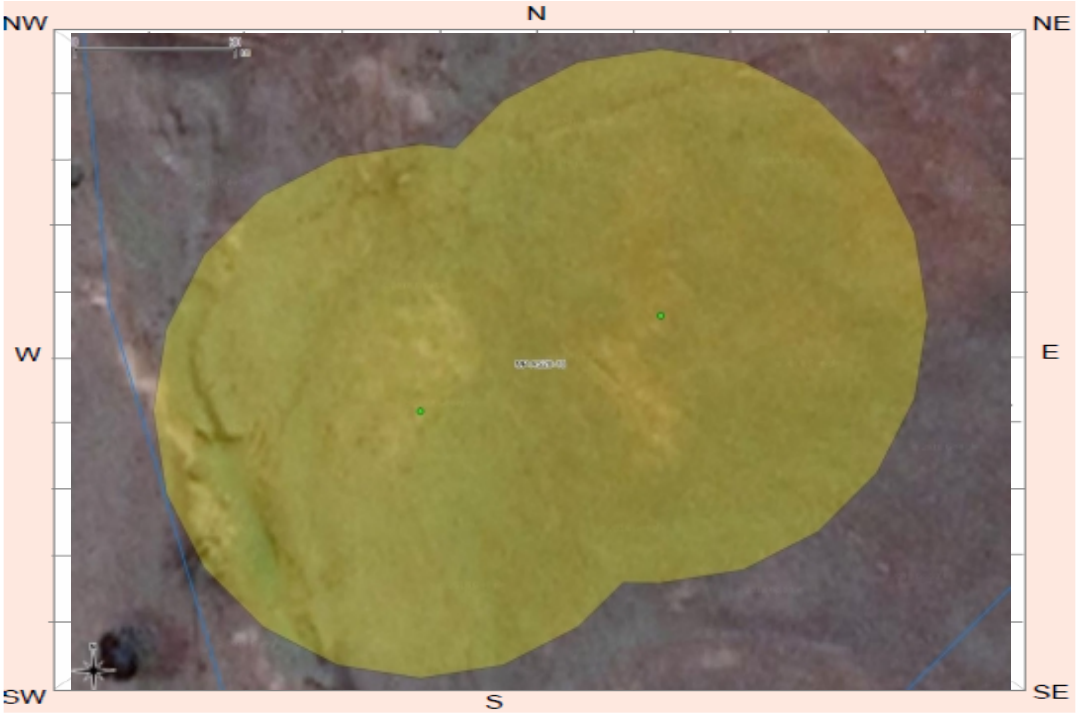
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

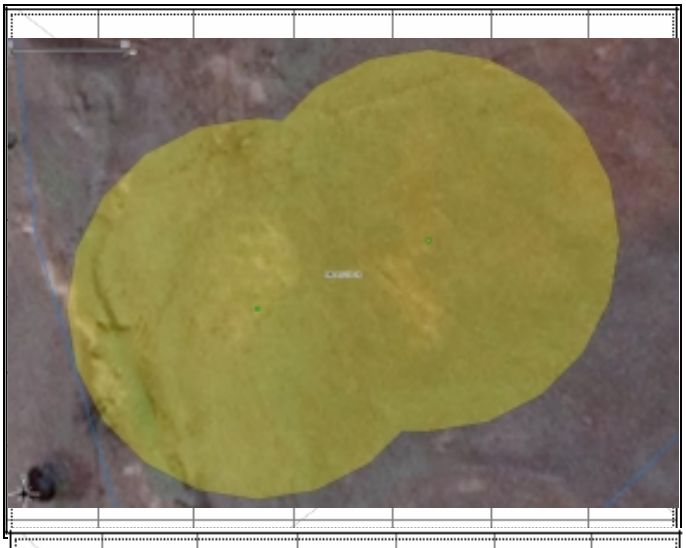
Description:

Other Site Info:

Site plan



Site photographs



Description: Site location

Description:

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5868 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-IA18-18

Easting: 299209 **Northing:** 6409376 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

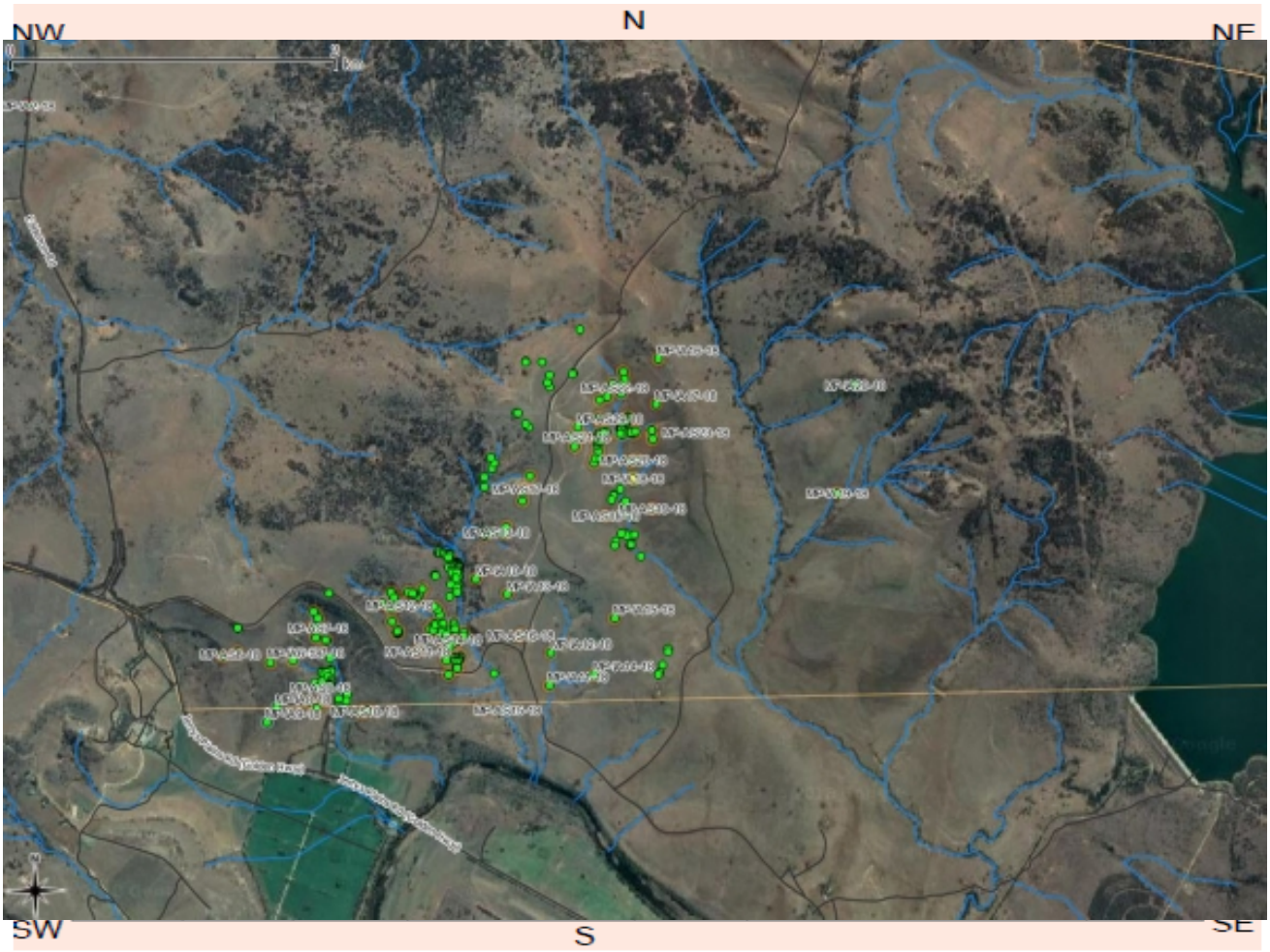
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 5 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 2.8 km north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x tuff flake shatter fragment

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

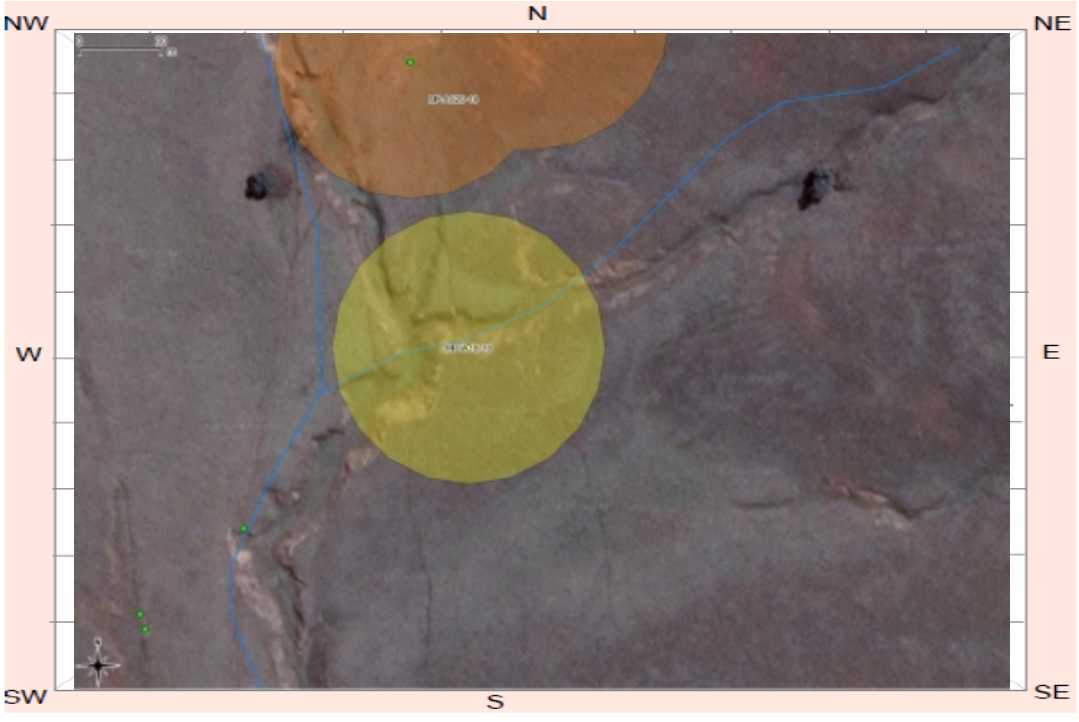
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefact location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5869 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS18-18

Easting: 299039 **Northing:** 6409147 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

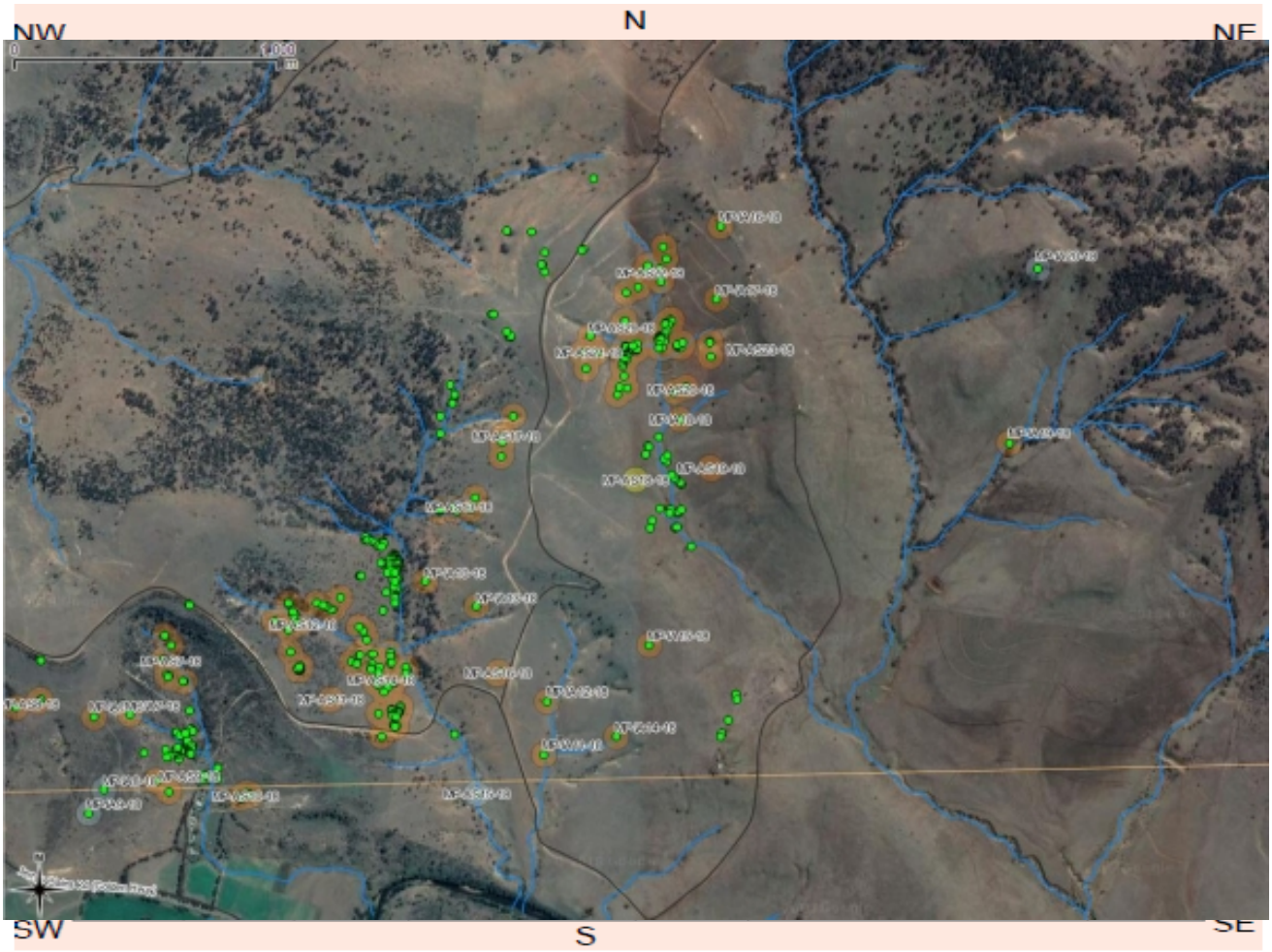
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 140 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 1.6 km north of the Hunter River.

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Poor

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	2	2	1				

Description:

Artefact scatter comprising 1 x tuff complete flake, 1 x tuff flake shatter fragment.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

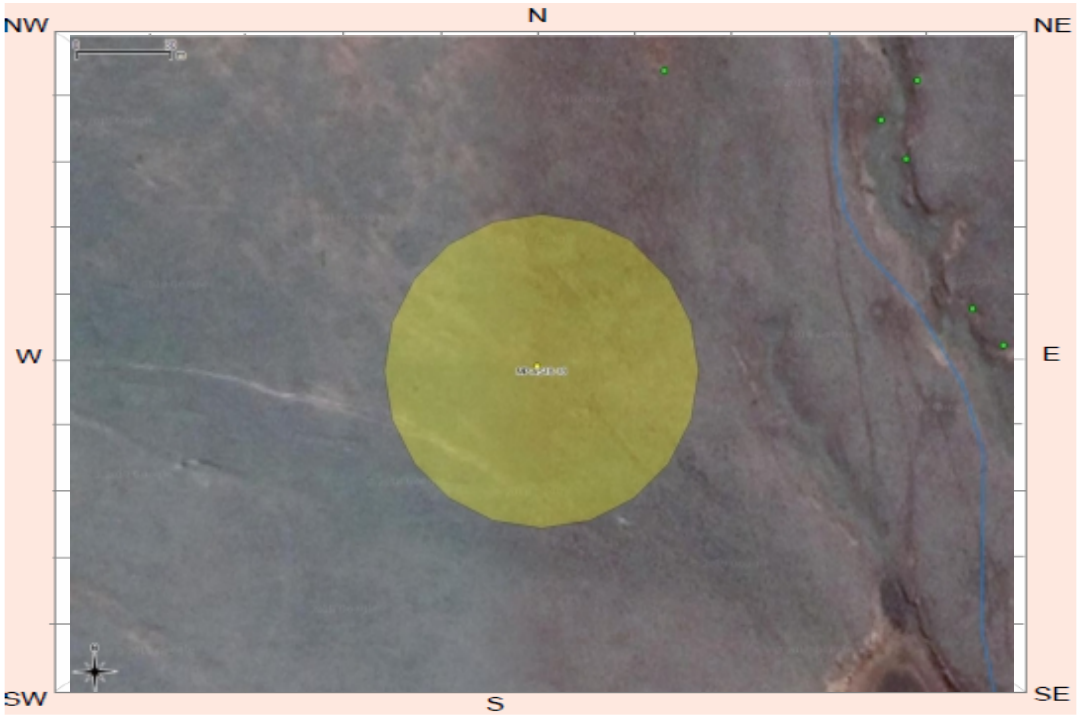
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefacts



Description: Artefact location

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5870 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS19-18

Easting: 299325 **Northing:** 6409191 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

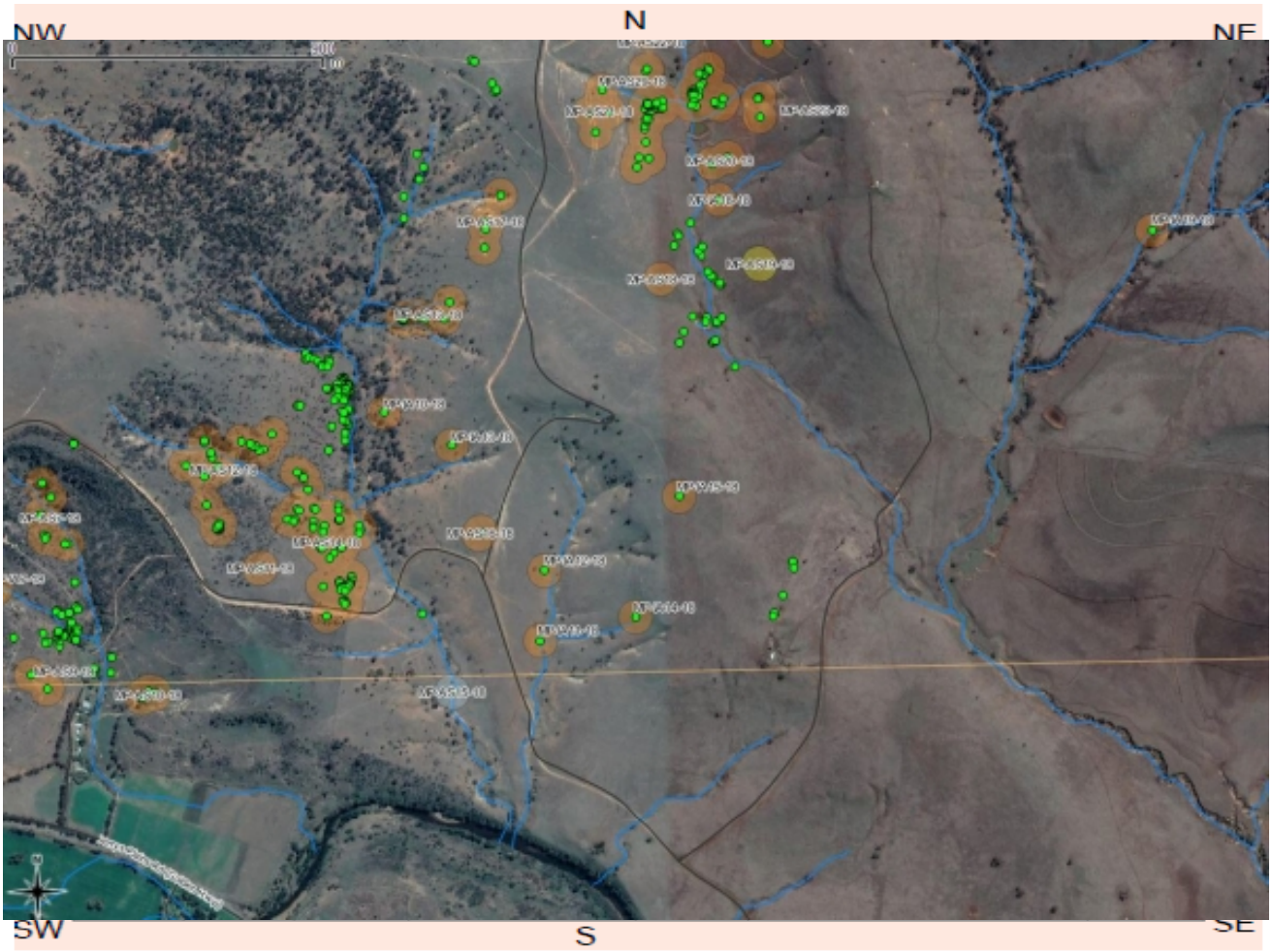
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 160 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 1.8 km north of the Hunter River.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	2	1	1				

Description:

Artefact scatter comprising 1 x tuff complete flake, 1 x tuff flake shatter fragment.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

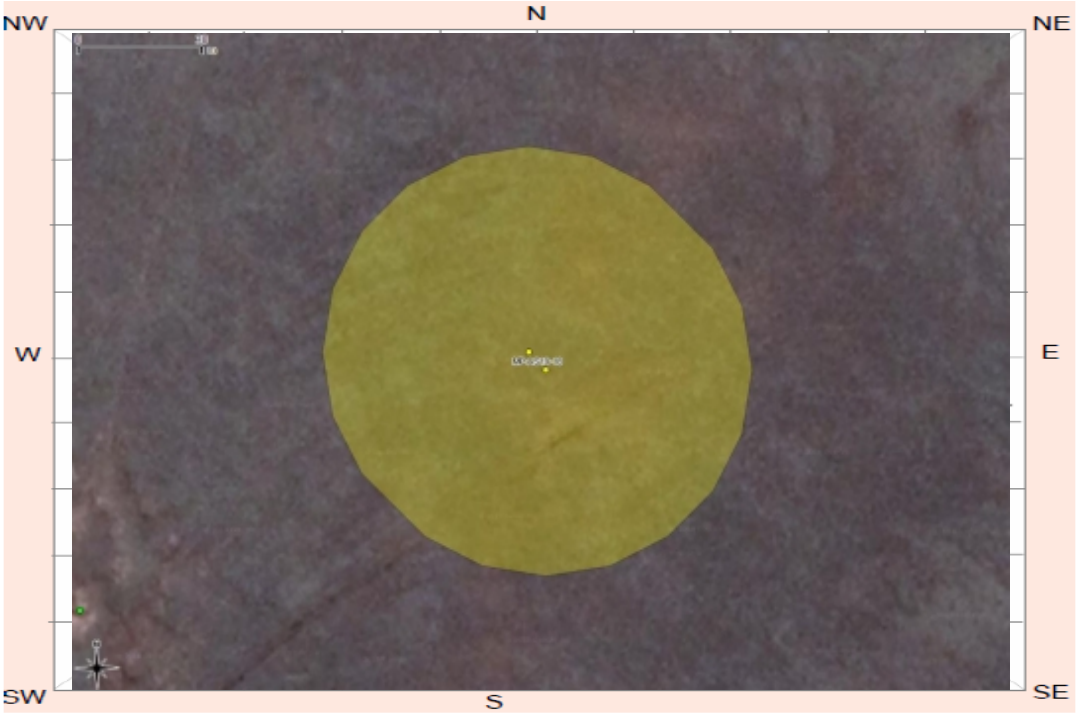
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

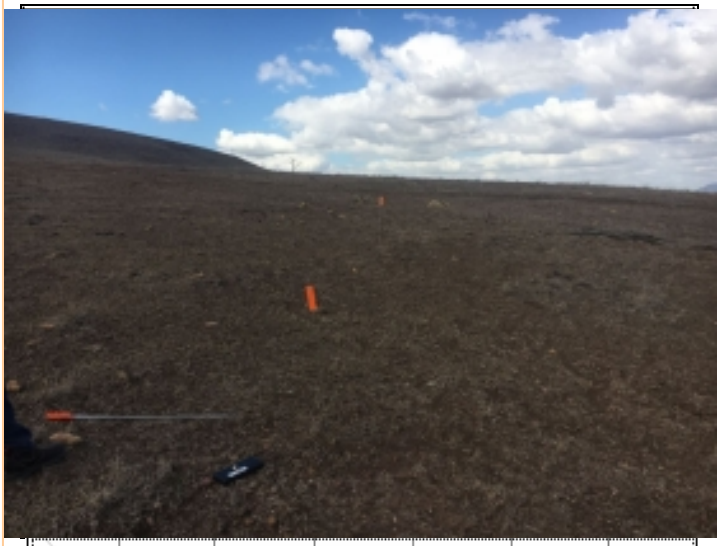
Description:

Other Site Info:

Site plan



Site photographs



Description: Site location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5871 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS17-18

Easting: 298547 **Northing:** 6409131 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title Mr. **Surname** Oakes **First name** Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

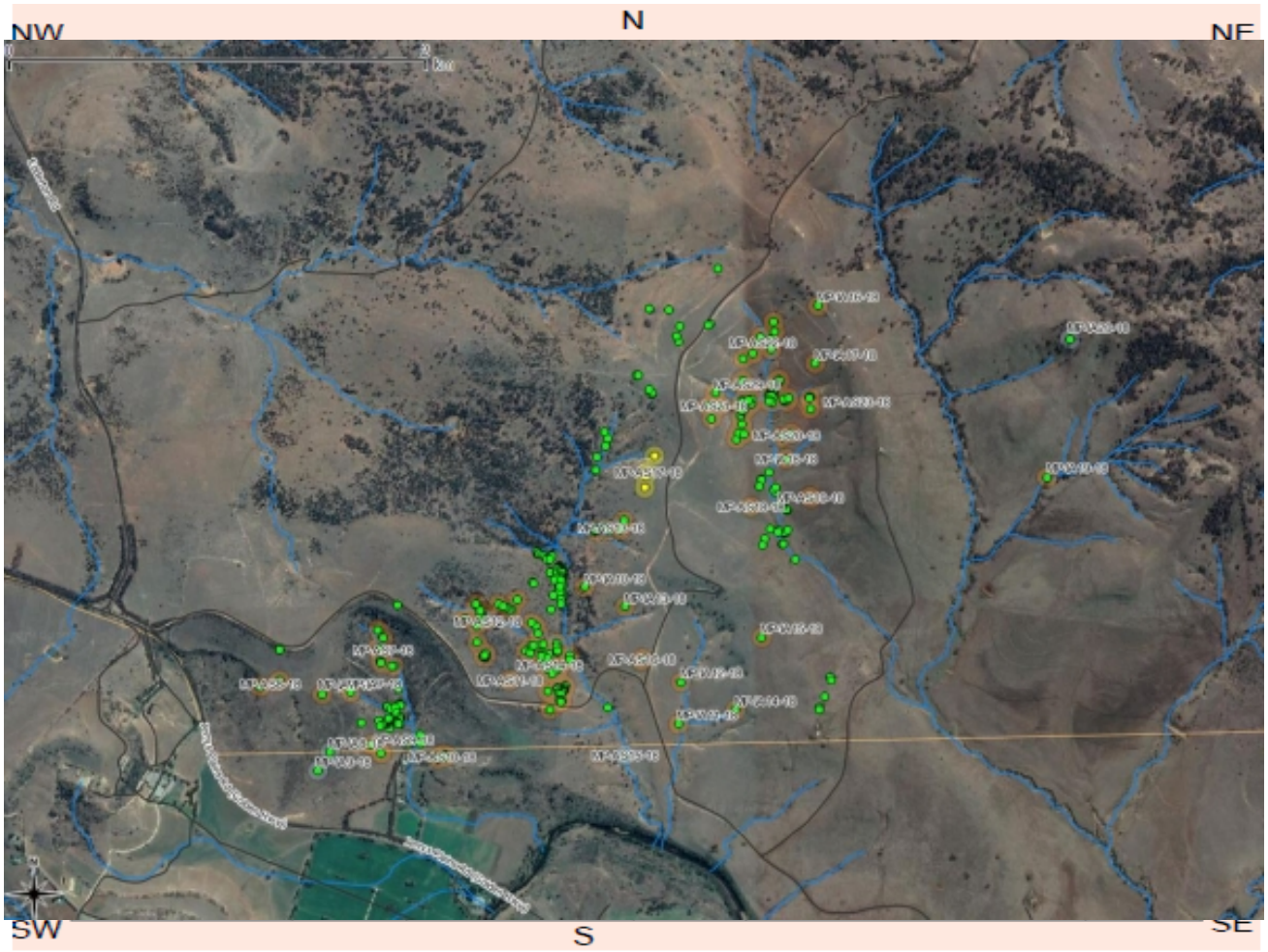
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 0 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 2.1 km north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Erosion

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	4	160	10				

Description:

Artefact scatter comprising 1 x basalt axe fragment (ground) and 2 x tuff complete flakes, 1 x tuff flake shatter.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Axe



Description: Axe

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5872 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS16-18

Easting: 298516 **Northing:** 6408413 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

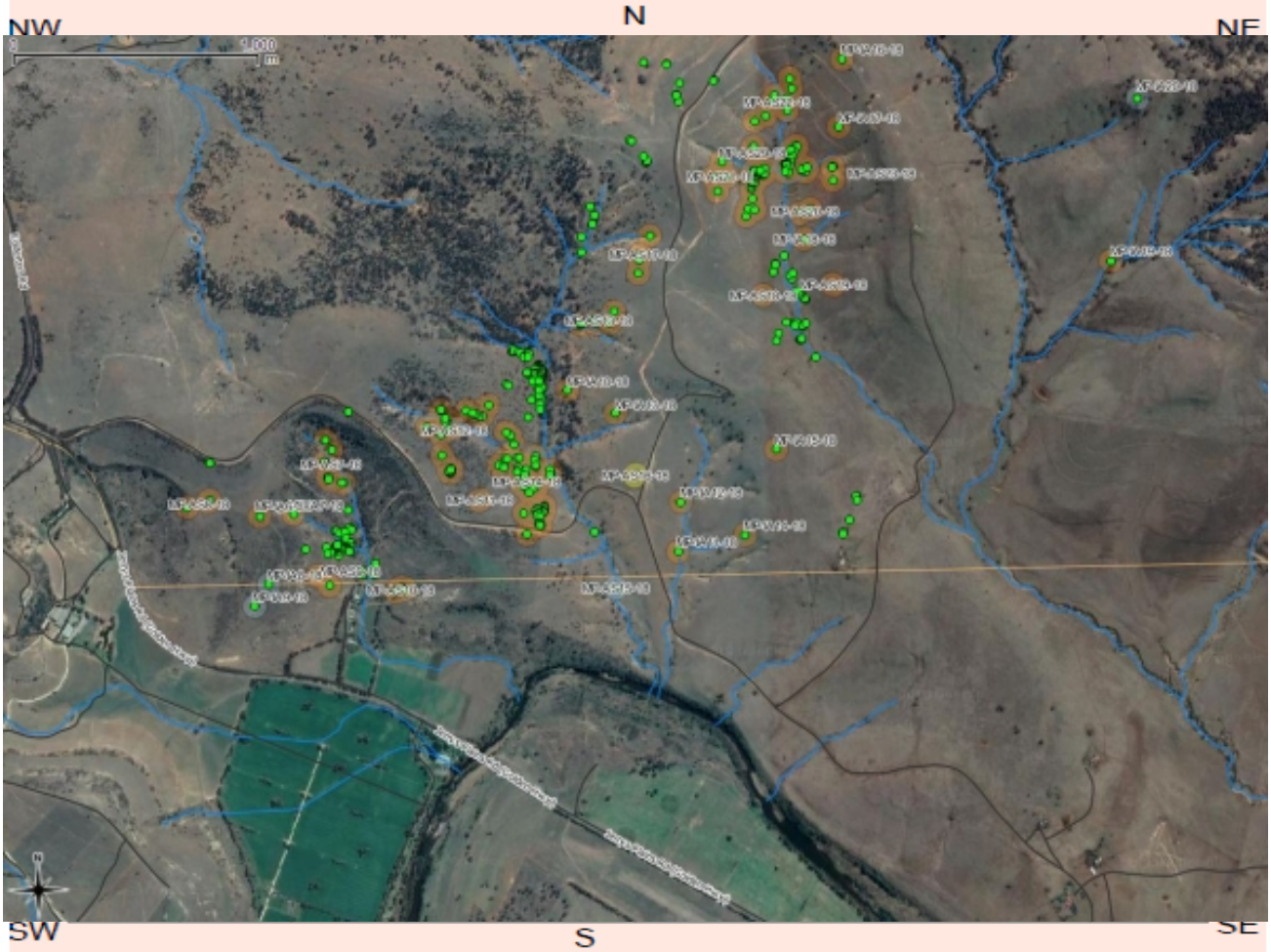
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 230 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 1.5 km north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Erosion

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	2	10	1				

Description:

Artefact scatter comprising 1 x basalt axe and 1 x tuff complete flake.

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

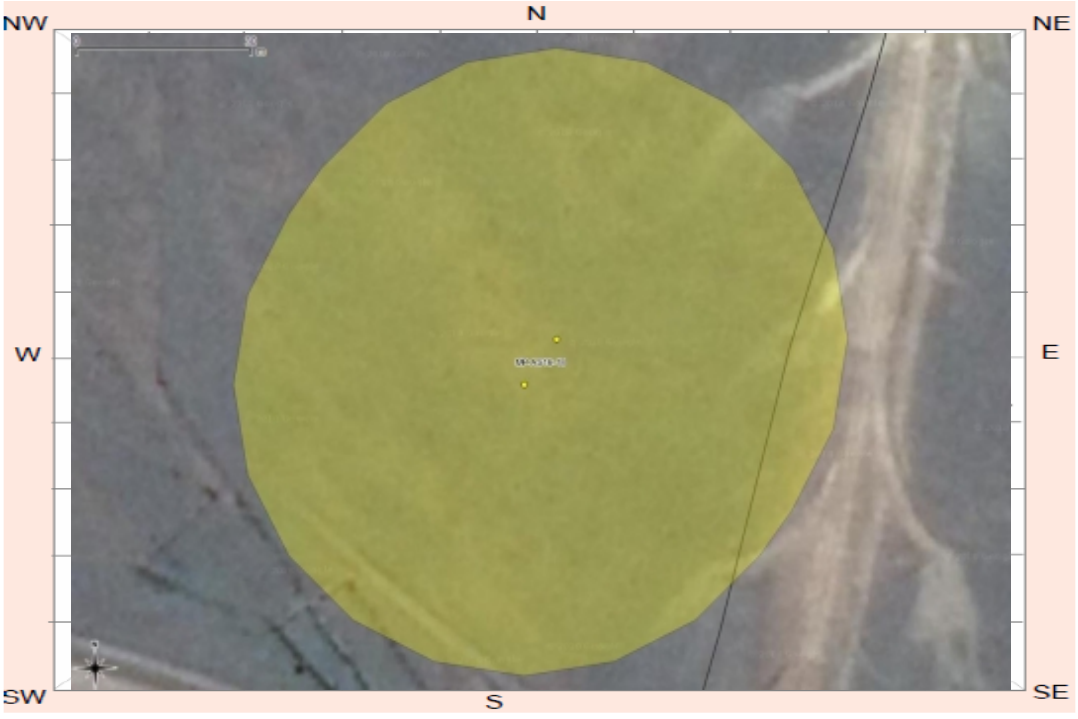
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Sample artefact

Description:

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5873 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS15-18

Easting: 298435 **Northing:** 6407953 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

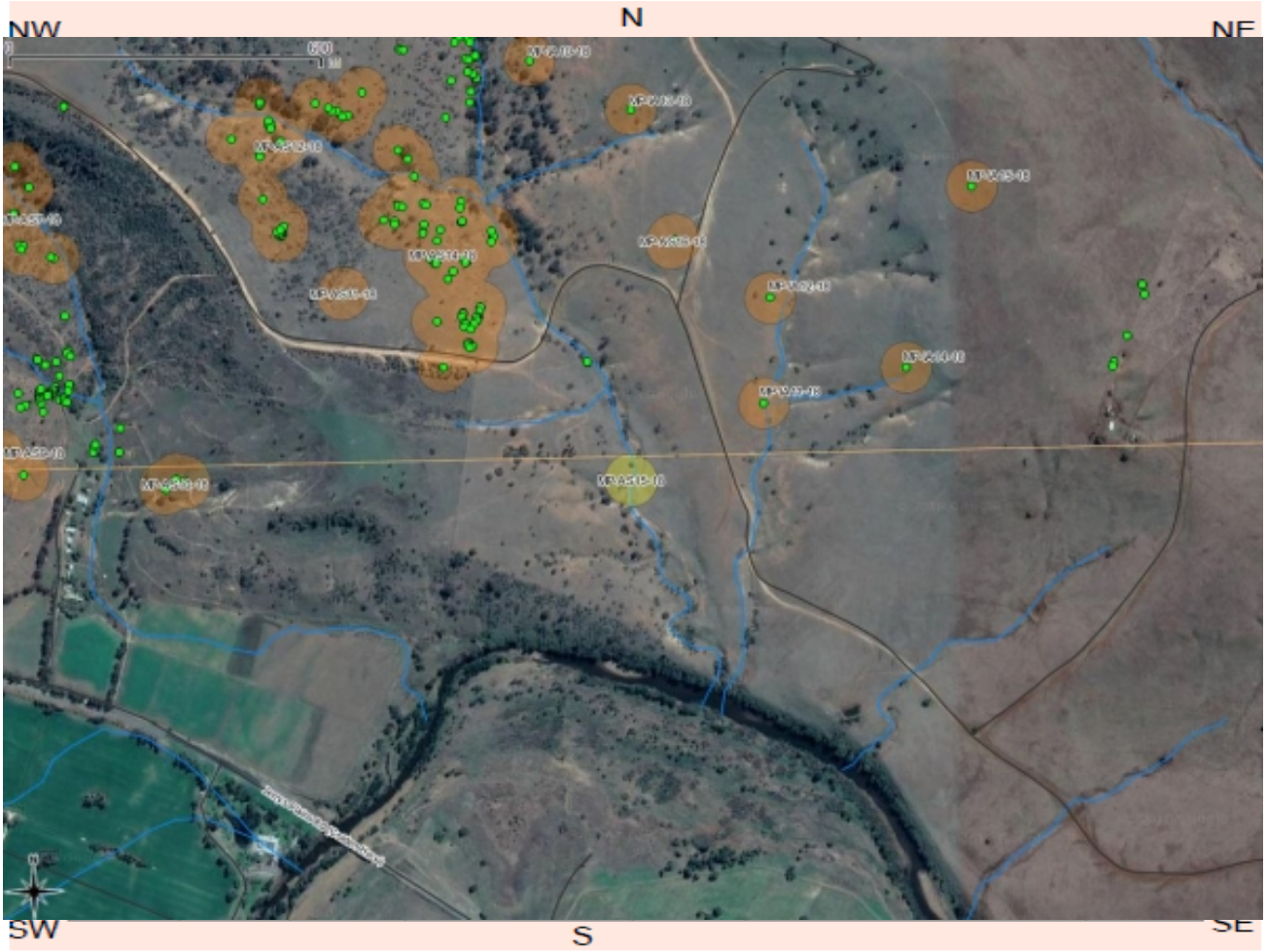
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 0 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 360 m north of the Hunter River.

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Erosion

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	2	3	1				

Description:

Artefact scatter comprising 1 x tuff unidirectional core, and 1 x tuff split flake.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

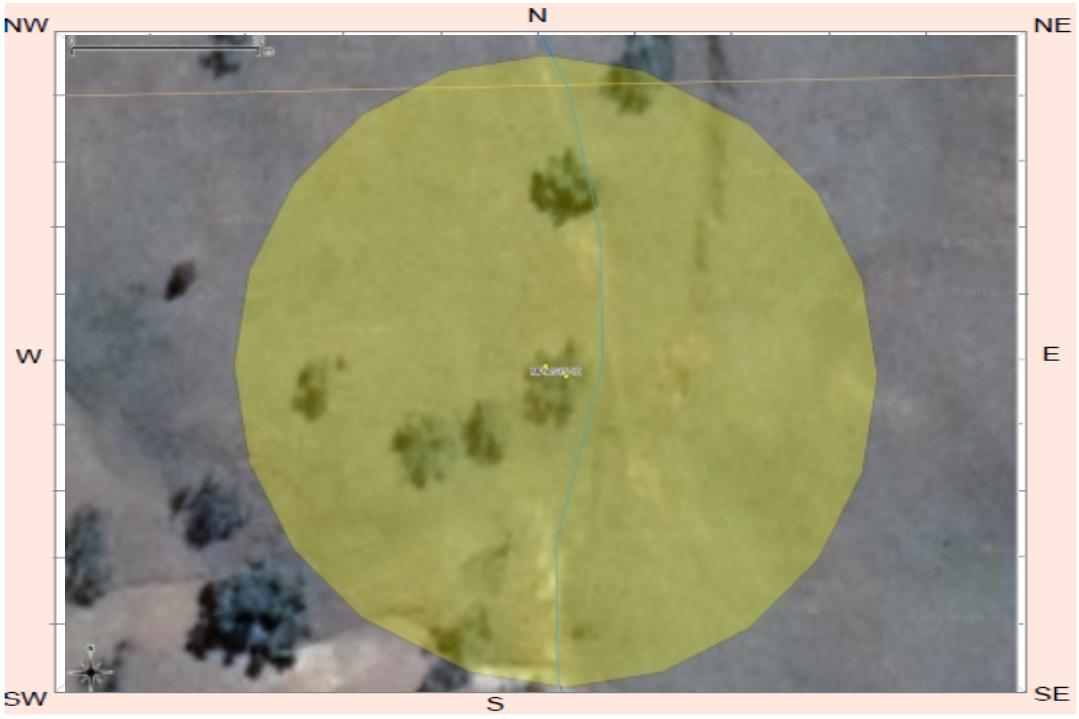
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Site location



Description: Sample artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5874 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS14-18

Easting: 297072 **Northing:** 6408387 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title Mr. **Surname** Oakes **First name** Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

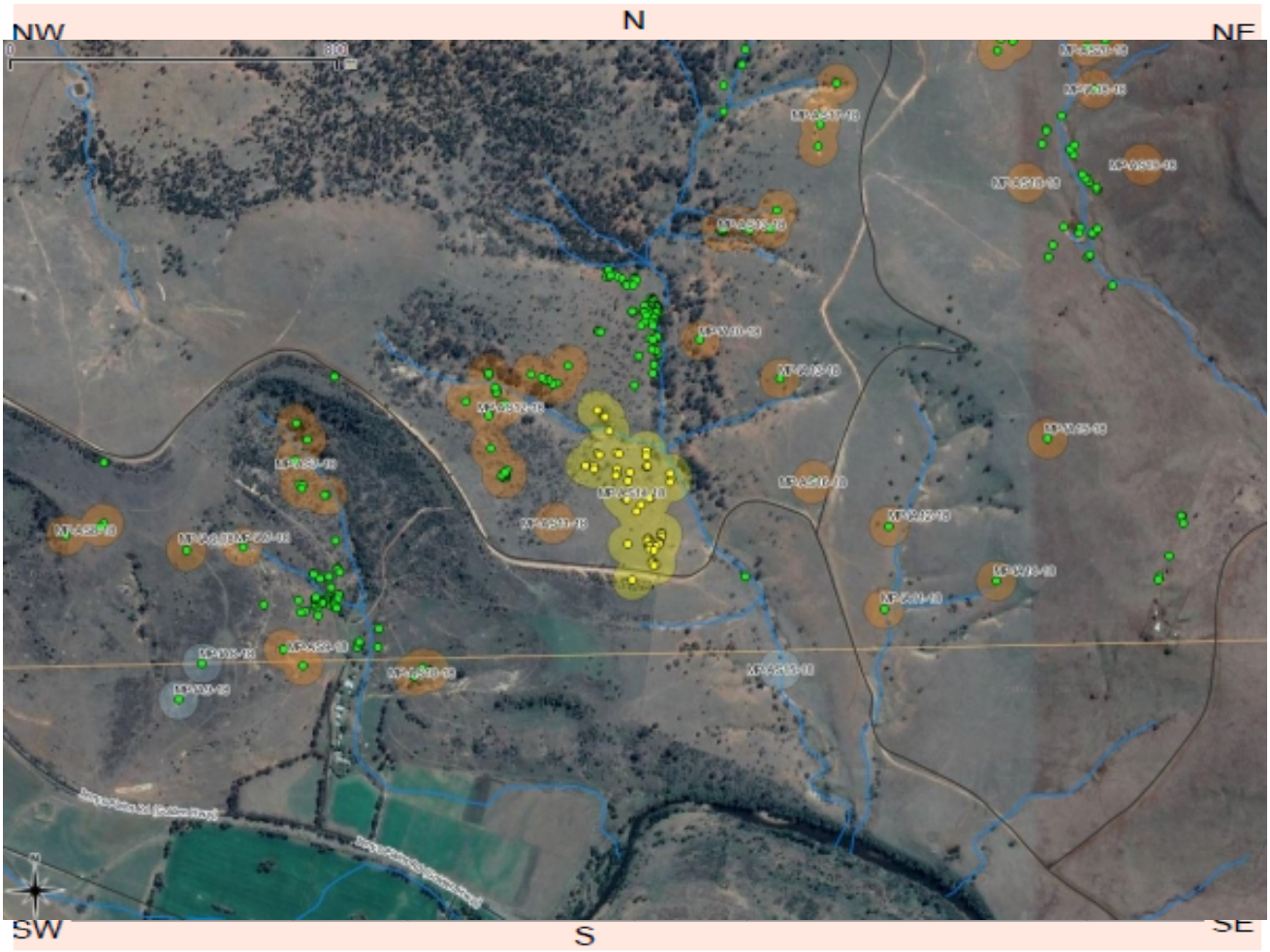
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 0 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 880 m north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Erosion

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	64	425	350				

Description:

Artefact scatter comprising 11 x angular shatter fragments, 1 x FGS chopper, 25 x complete flakes, 1 x silcrete multidirectional core, 25 flake shatter fragments and 1 x split flake.

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

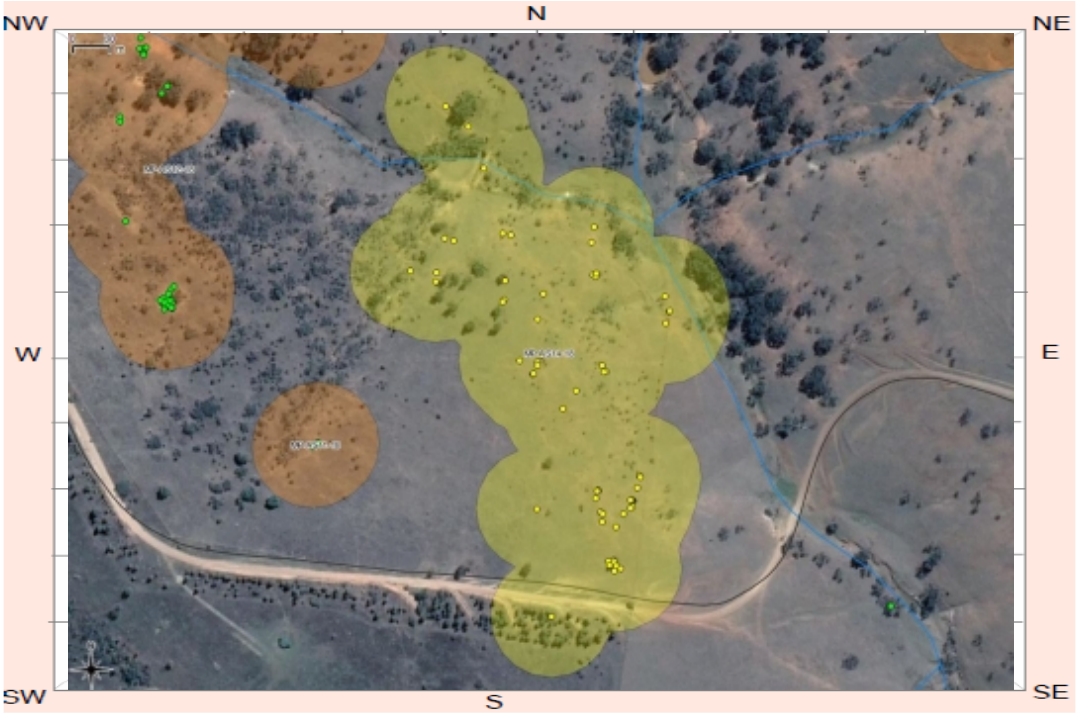
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Site location



Description: Site location



Description: Sample artefact



Description: Sample artefacts

Site restrictions

Do you want to Restrict this site?: ☐

Restriction type: Gender ☐ General ☐ Location ☐

Why is this site restricted?:

Further information contact

Title	Surname	First name

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5875 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS13-18

Easting: 298366 **Northing:** 6409045 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

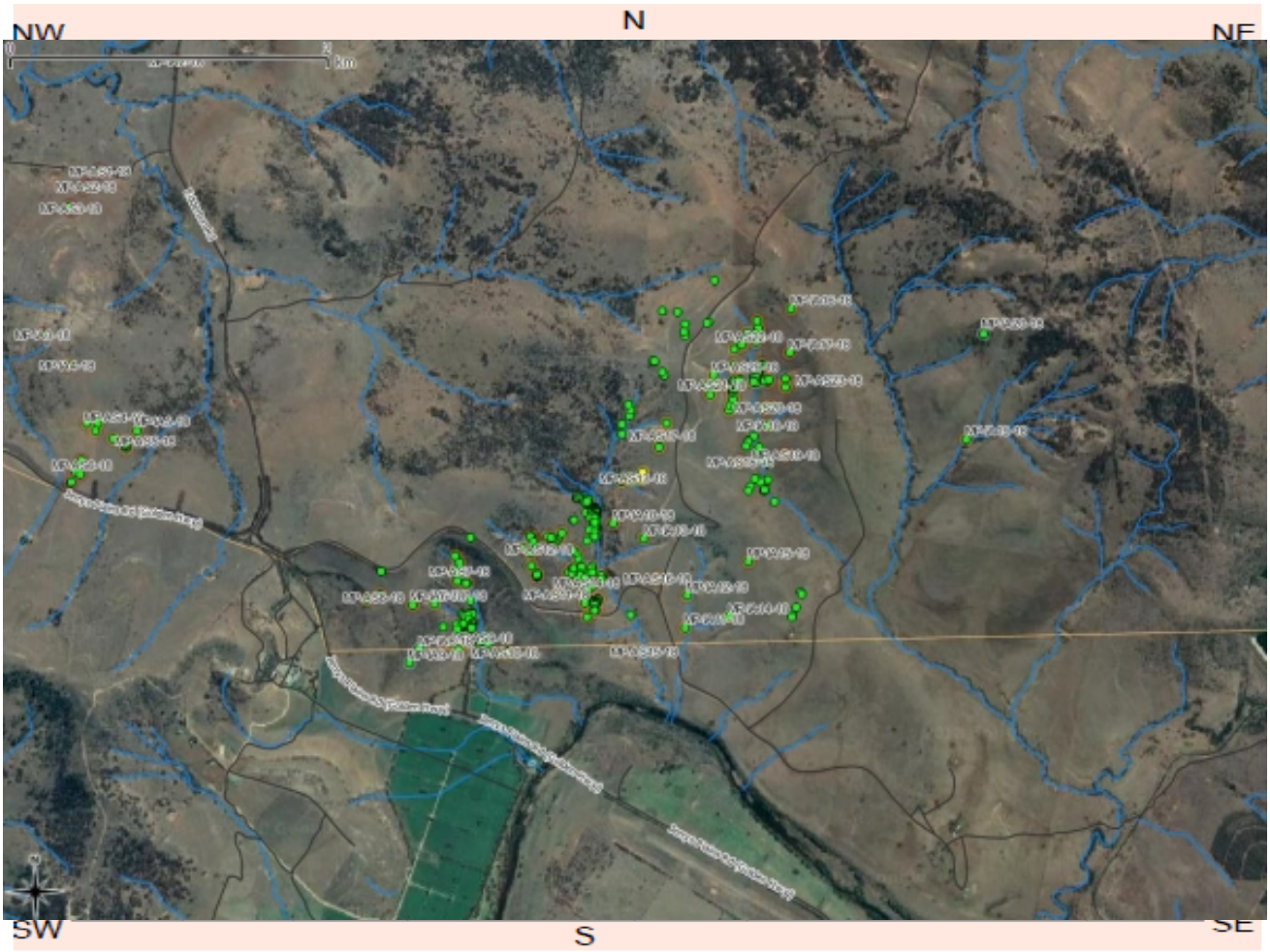
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 0 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 2.1 km north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Erosion

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	15	150	50				

Description:

Artefact scatter comprising 8 x complete flakes, 4 x flake shatter fragments, 3 x angular shatter fragments.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

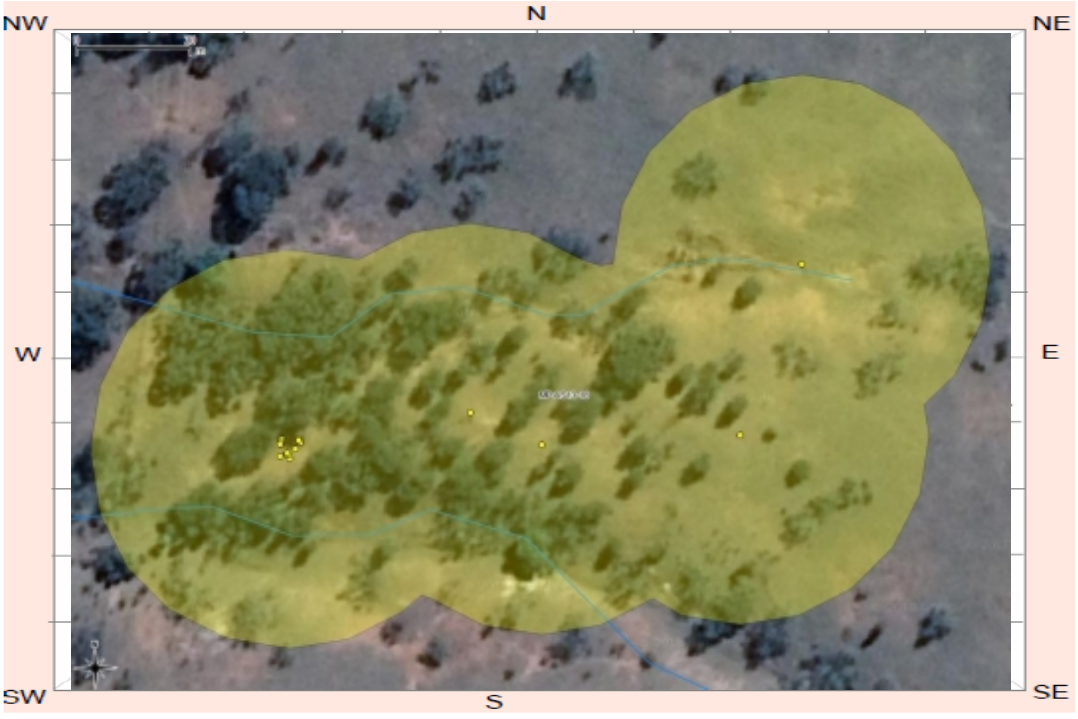
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Site location



Description: Sample artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5876 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS12-18

Easting: 297775 **Northing:** 6408596 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

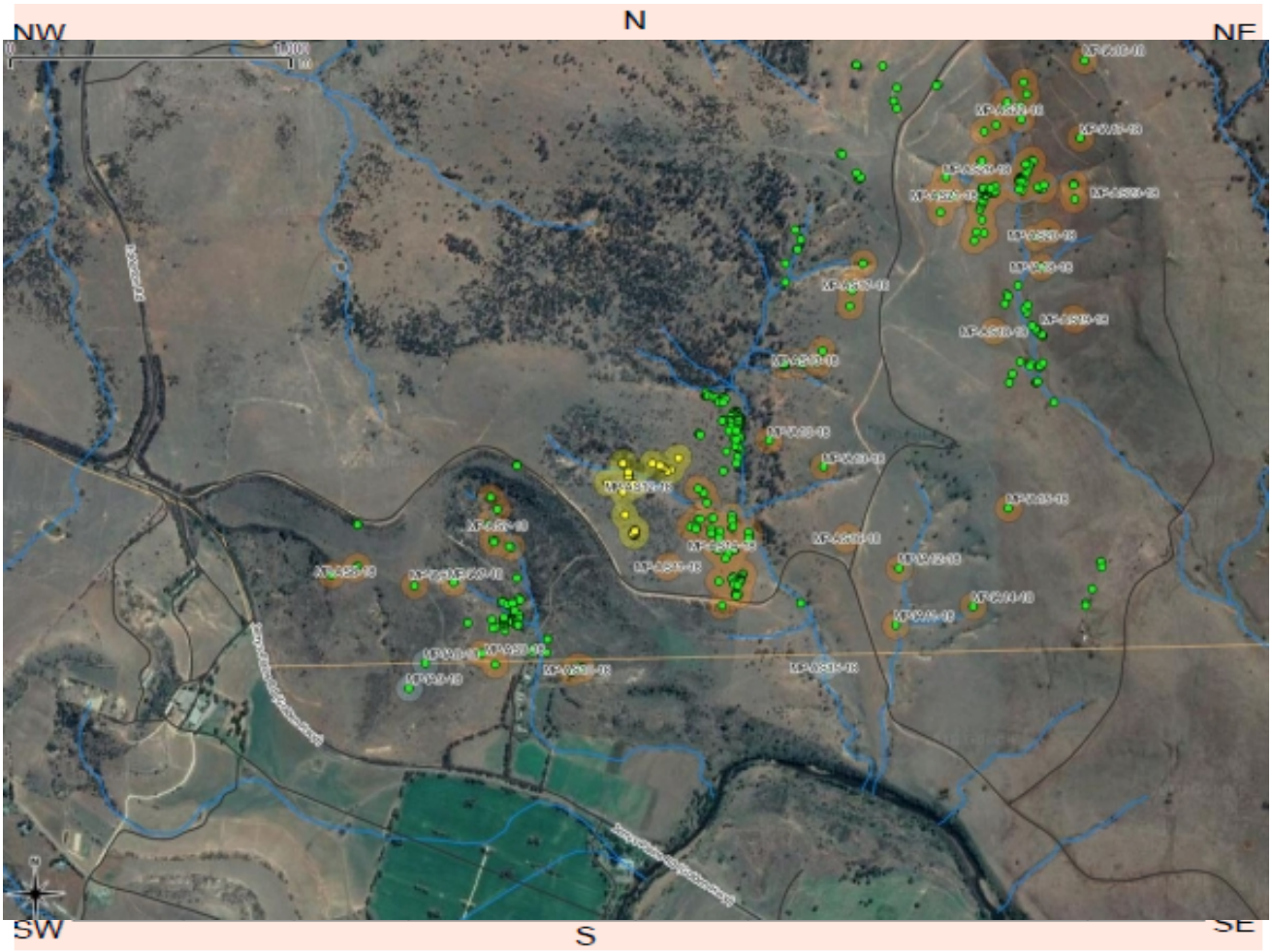
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 0 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 1 km north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Erosion

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	41	320	170				

Description:

Artefact scatter comprising 19 x complete flakes, 7 x flake shatter fragments, 1 x basalt axe, 6 x cores, 6 x flake shatter fragments and 2 x split flake.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

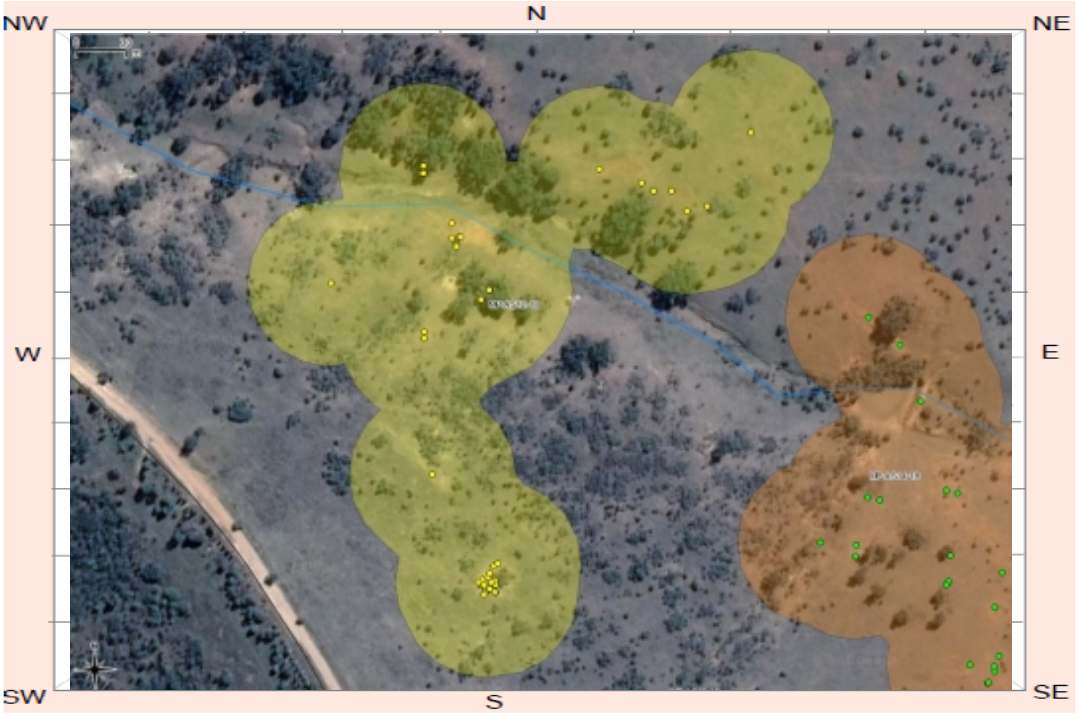
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefact location



Description: Artefact location



Description: Sample artefacts



Description: Axe

Site restrictions

Do you want to Restrict this site?: ☐

Restriction type: Gender ☐ General ☐ Location ☐

Why is this site restricted?:

Further information contact

Title	Surname	First name

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5877 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS11-18

Easting: 297881 **Northing:** 6408312 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

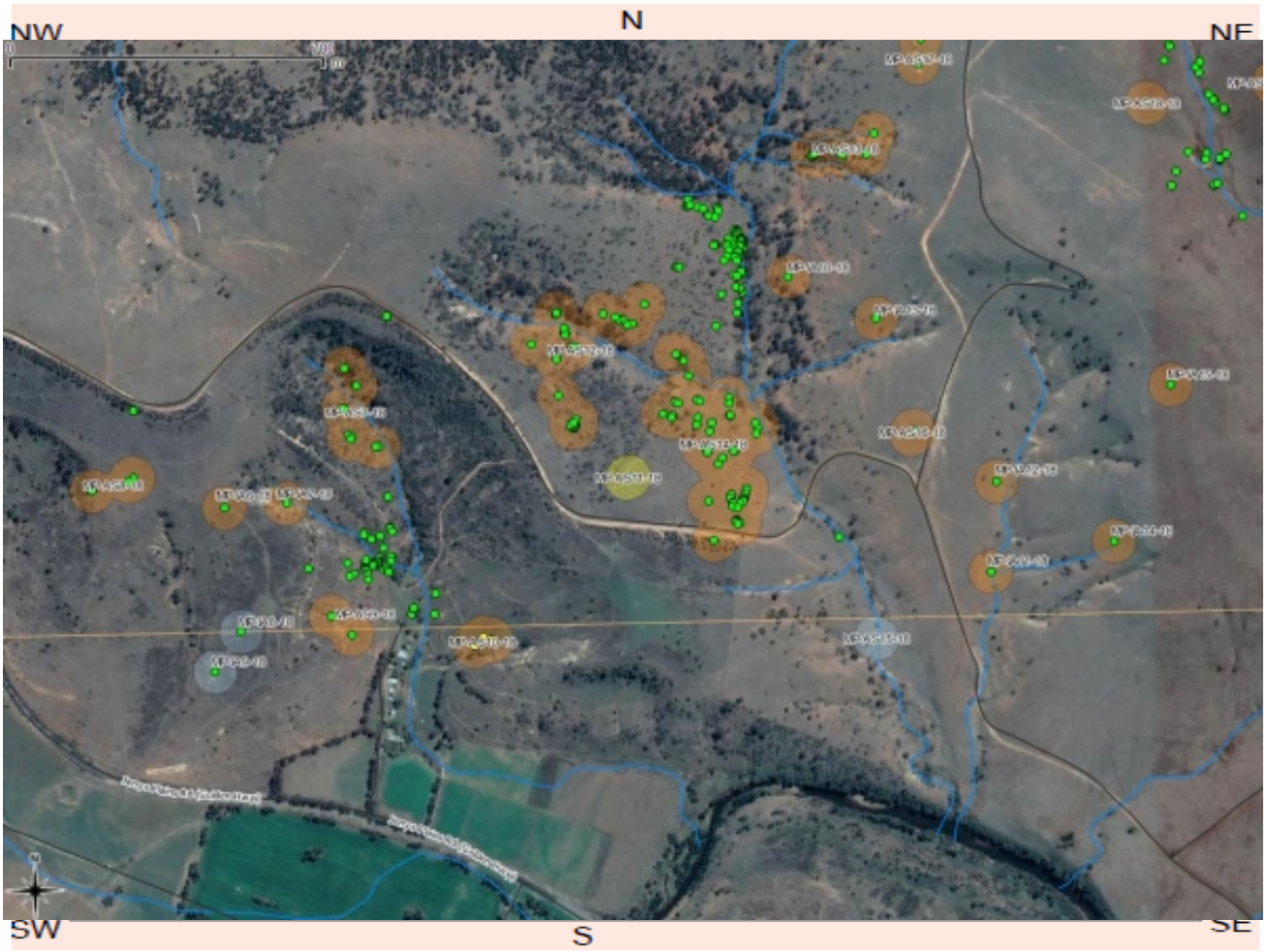
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 290 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 1 km north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Poor

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	4	6	2				

Description:

Artefact scatter comprising 2 x tuff complete flakes and 2 x tuff flake shatter fragments.

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

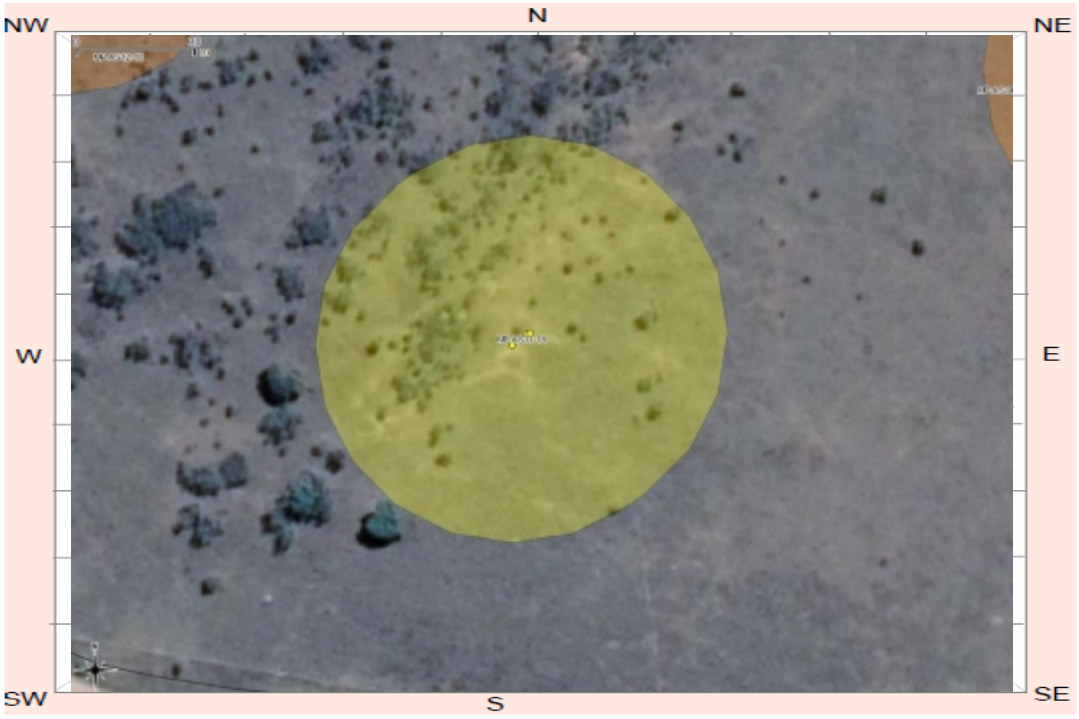
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Site Location

Description:

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5878 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS10-18

Easting: 297557 **Northing:** 6407946 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

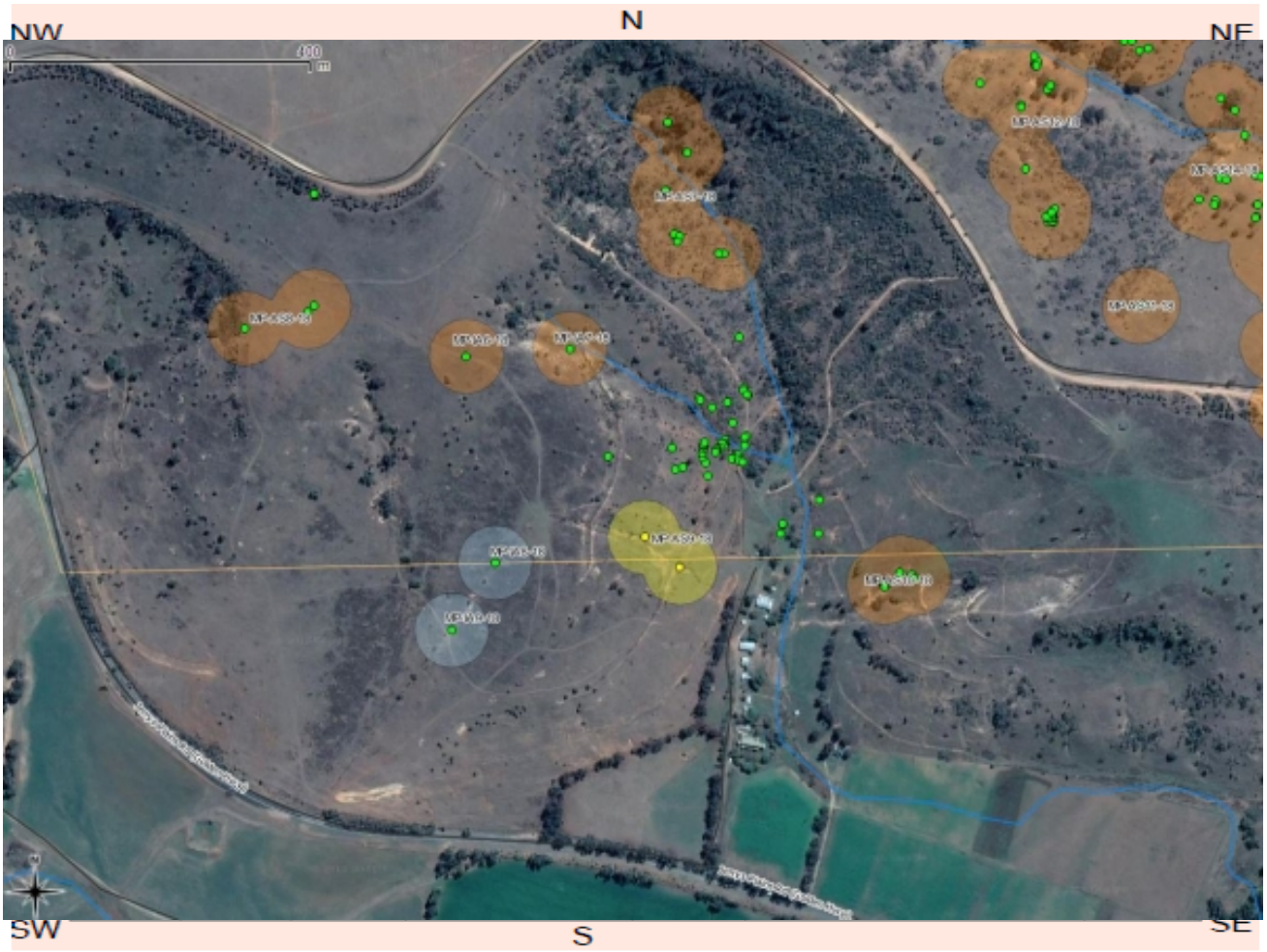
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 115 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 485 m north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Erosion

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	14	40	10				

Description:

Artefact scatter comprising 4 x tuff complete flakes, 5 x tuff angular shatter fragments, 4 x flake shatter pieces and 1 x tuff multidirectional core.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

Description:

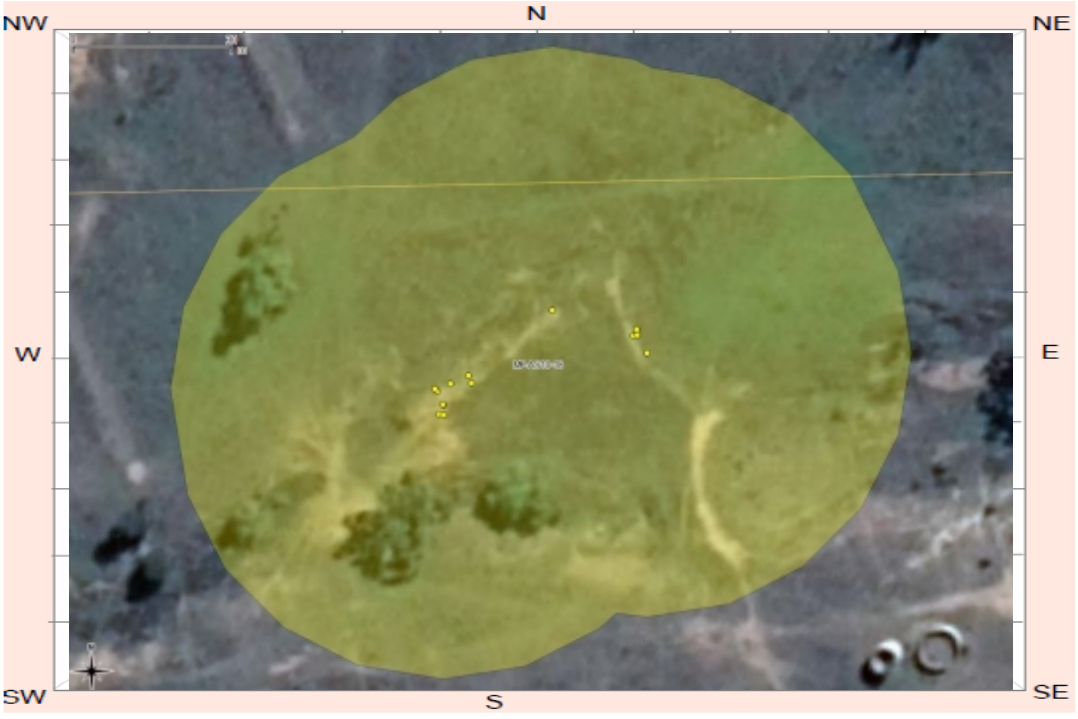
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Site Location

Description:

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5879 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS9-18

Easting: 297242 **Northing:** 6407982 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

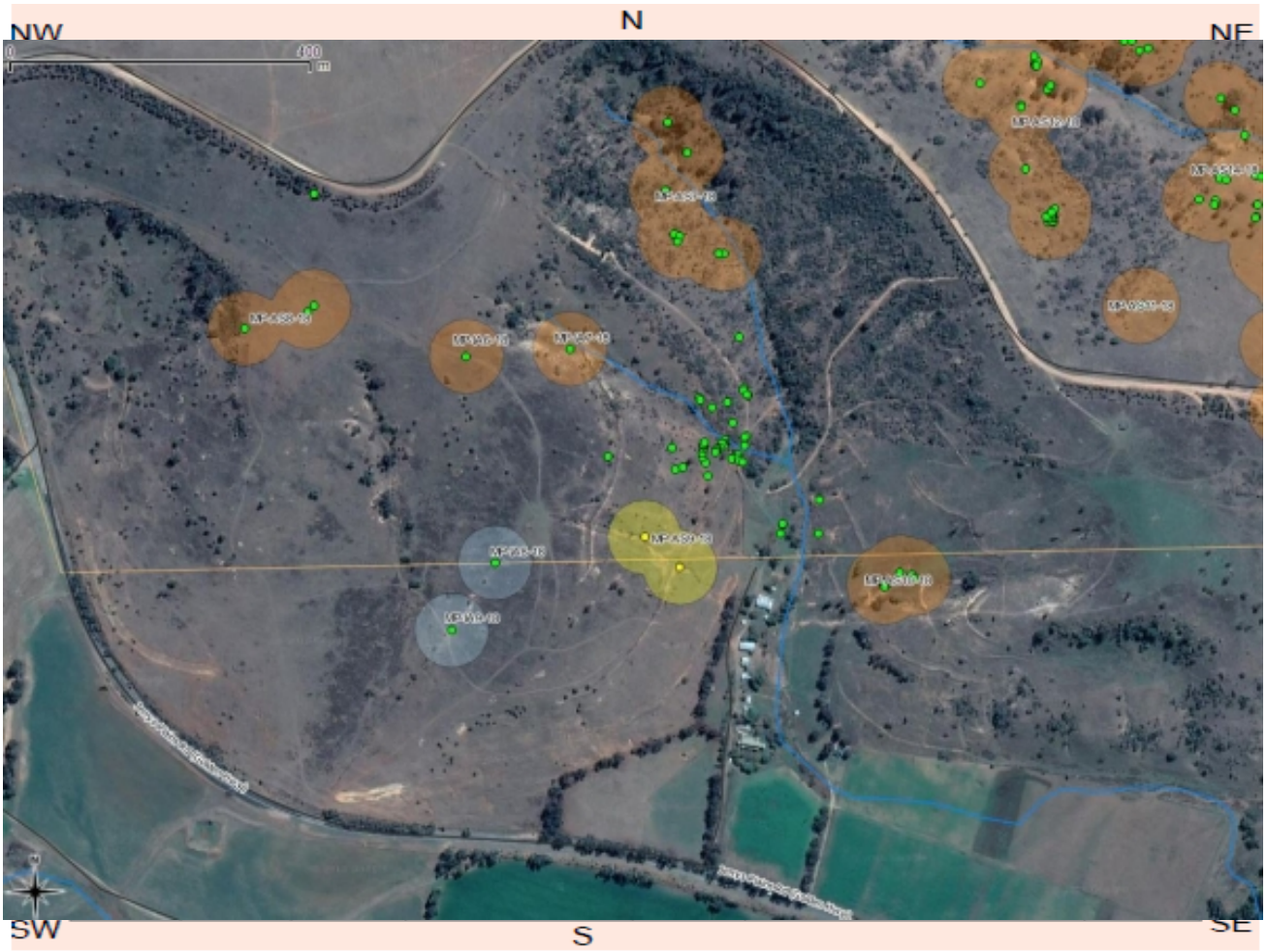
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 160 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 400 m north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Erosion

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	2	61	20				

Description:

Artefact scatter comprising 1 x tuff complete flake and 1 x silcrete complete flake.

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

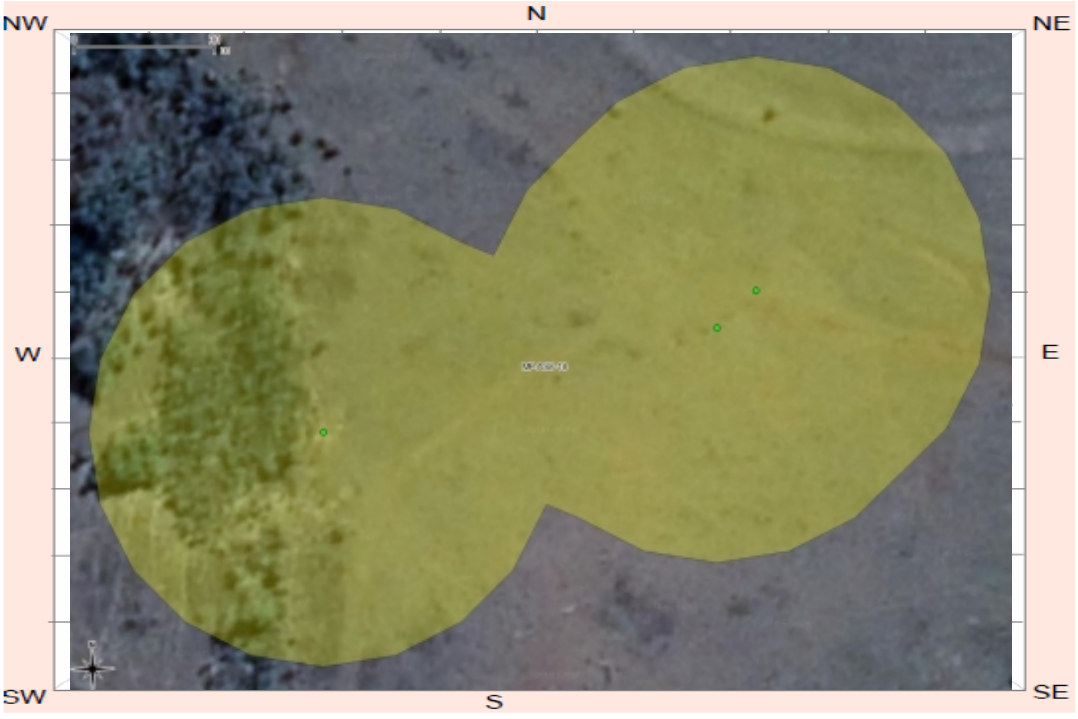
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Site location



Description: Sample artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5880 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS8-18

Easting: 296732 **Northing:** 6408295 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title Mr. **Surname** Oakes **First name** Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

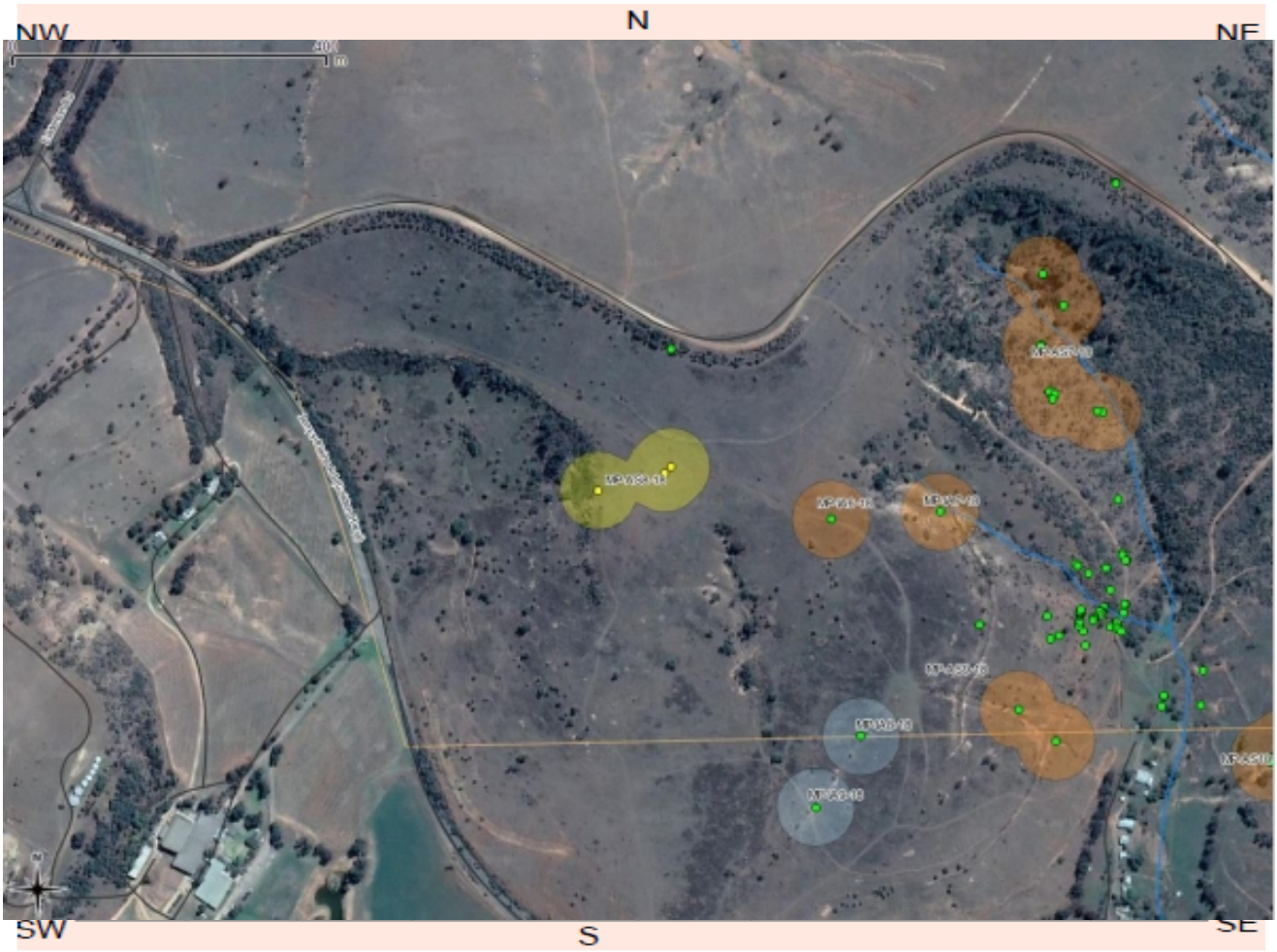
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 300 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 360 m east of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Erosion

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	3	100	20				

Description:

Artefact scatter comprising 1 x tuff unidirectional core, 1 x silcrete complete core, and 1 x tuff flake shatter fragments.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

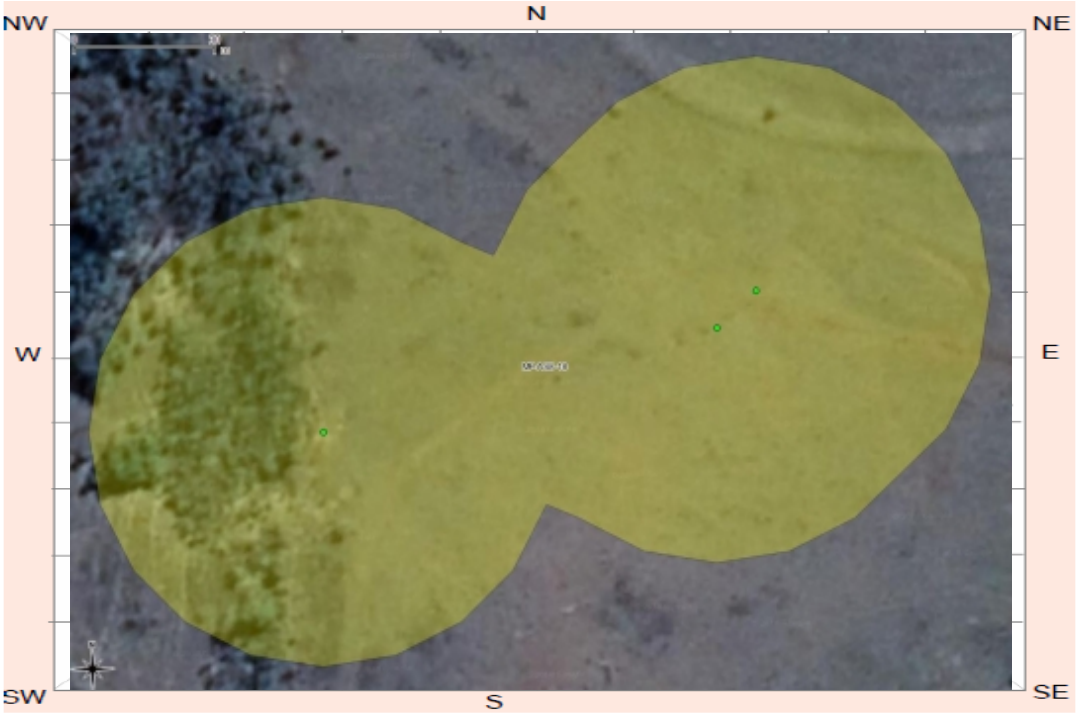
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefact location



Description: Sample artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5881 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS7-18

Easting: 297273 **Northing:** 6408458 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

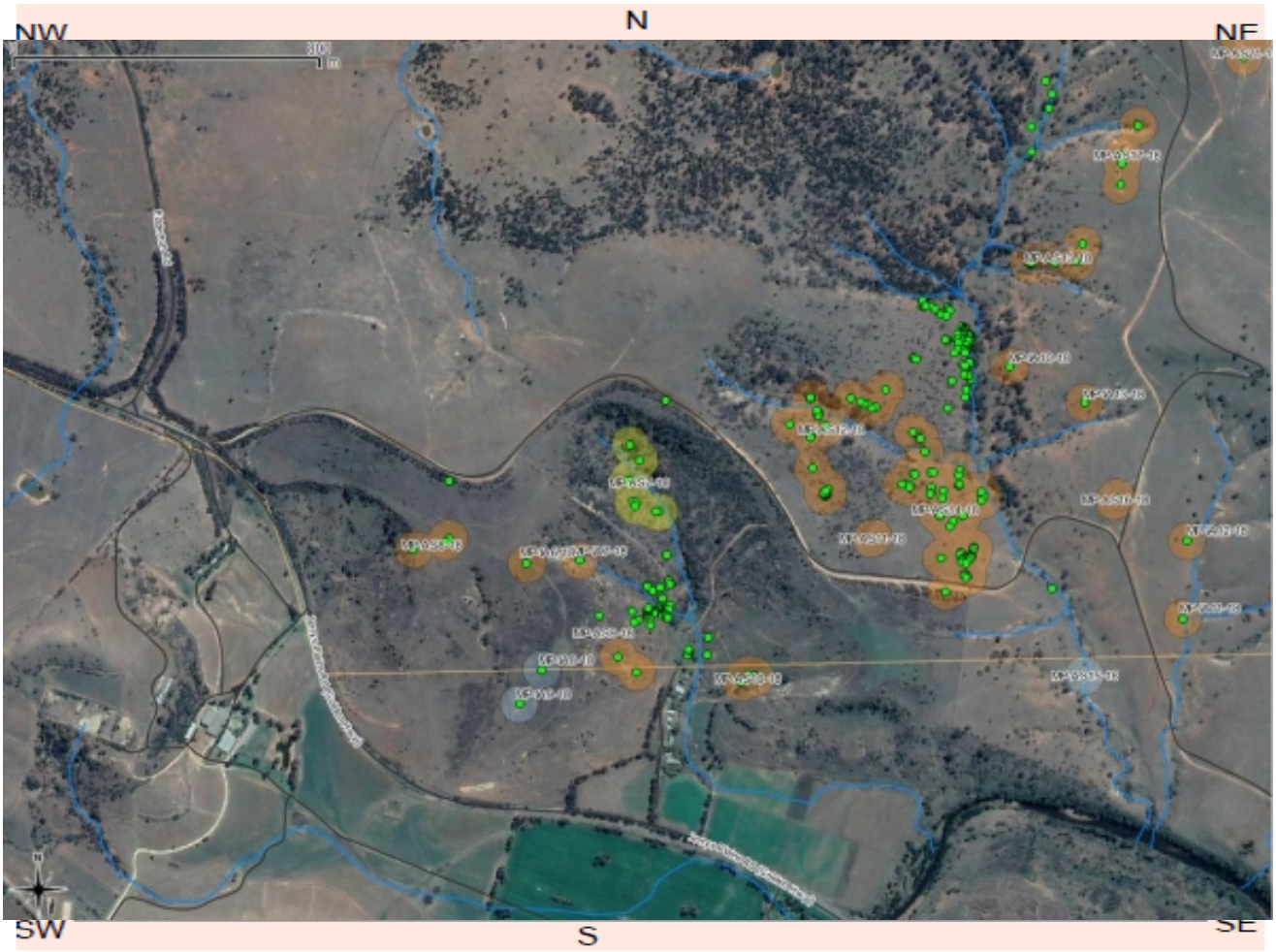
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 0 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 850 m north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Poor

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
1. Artefact	9	190	70				

Description:

Artefact scatter comprising 4 x tuff complete flakes, 2 tuff angular shatter fragments, 1 x tuff proximal flake, 1 x tuff unidirectional core and 1 x tuff bidirectional core.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
2.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

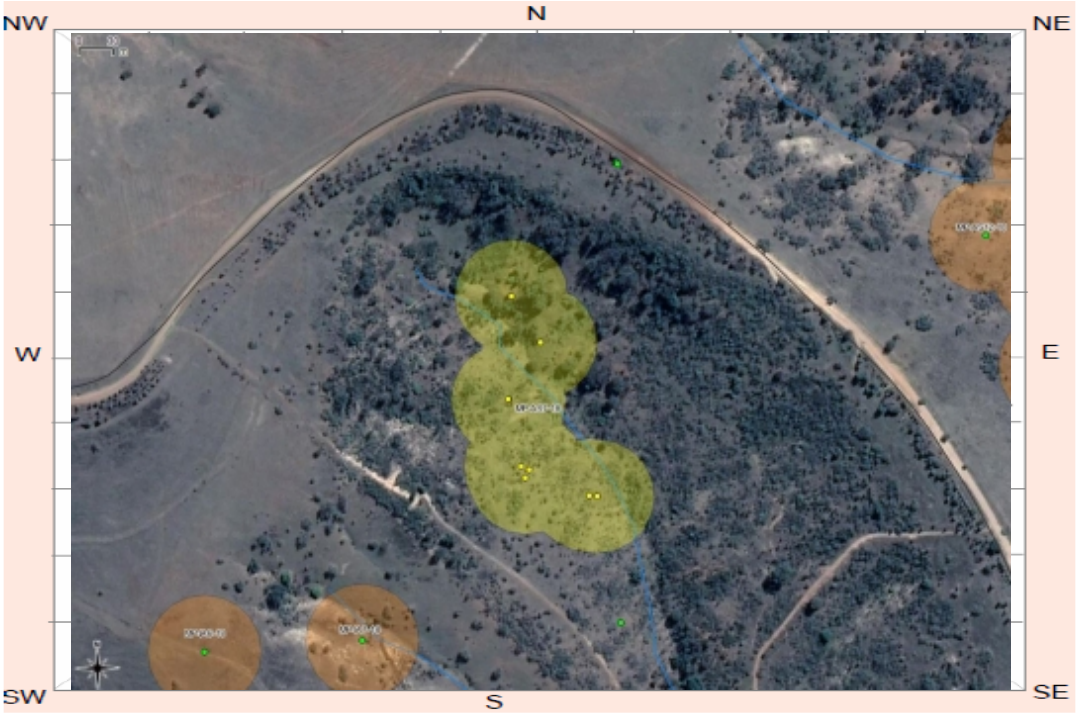
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefact location



Description: Sample artefacts

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5882 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS5-18

Easting: 295143 **Northing:** 6409263 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title Mr. **Surname** Oakes **First name** Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

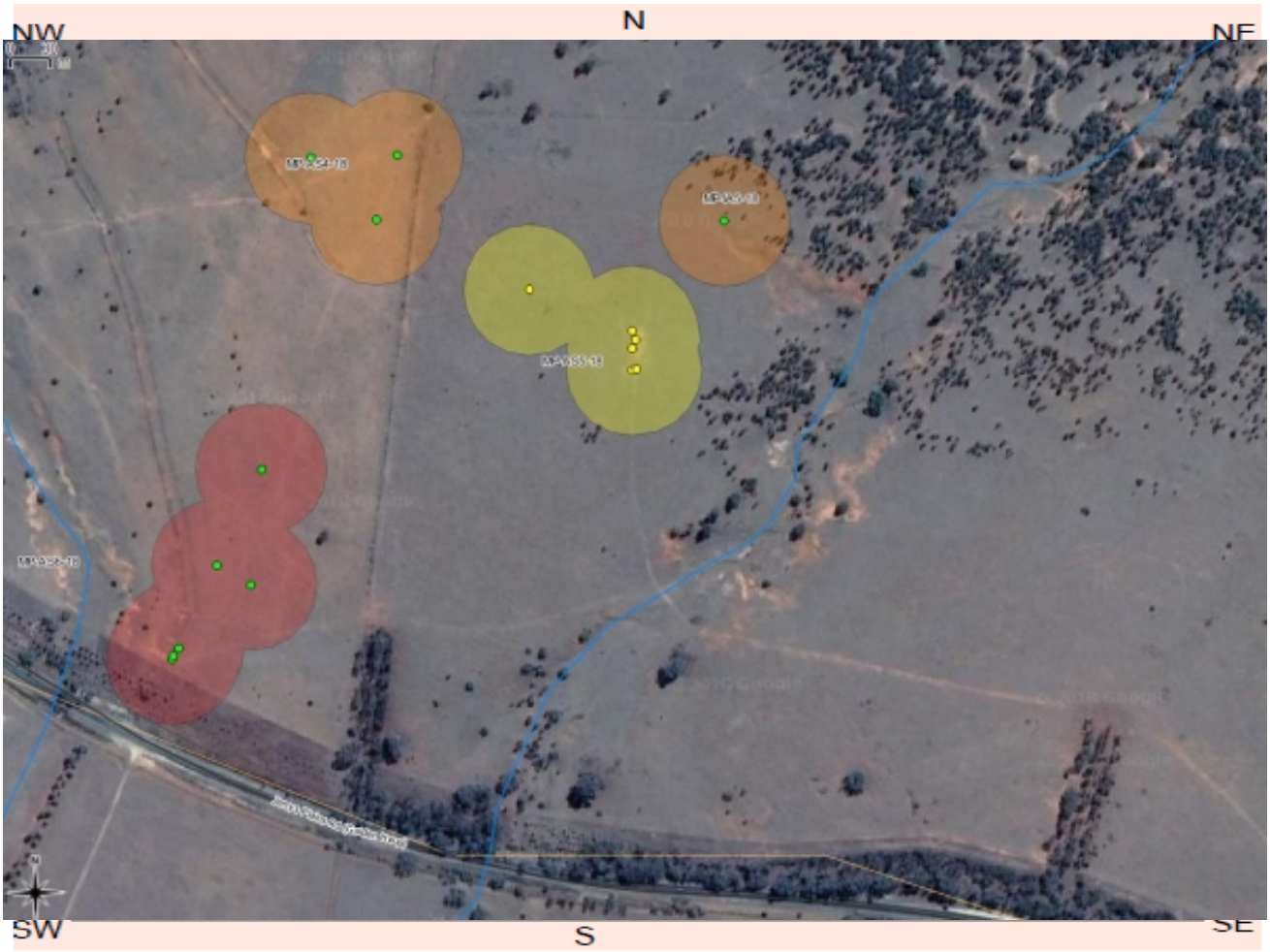
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 150 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 350 m north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	6	170	160				

Description:

Artefact scatter comprising 2 x tuff complete flakes, 1 tuff bidirectional core and 3 tuff flake shatter fragments

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

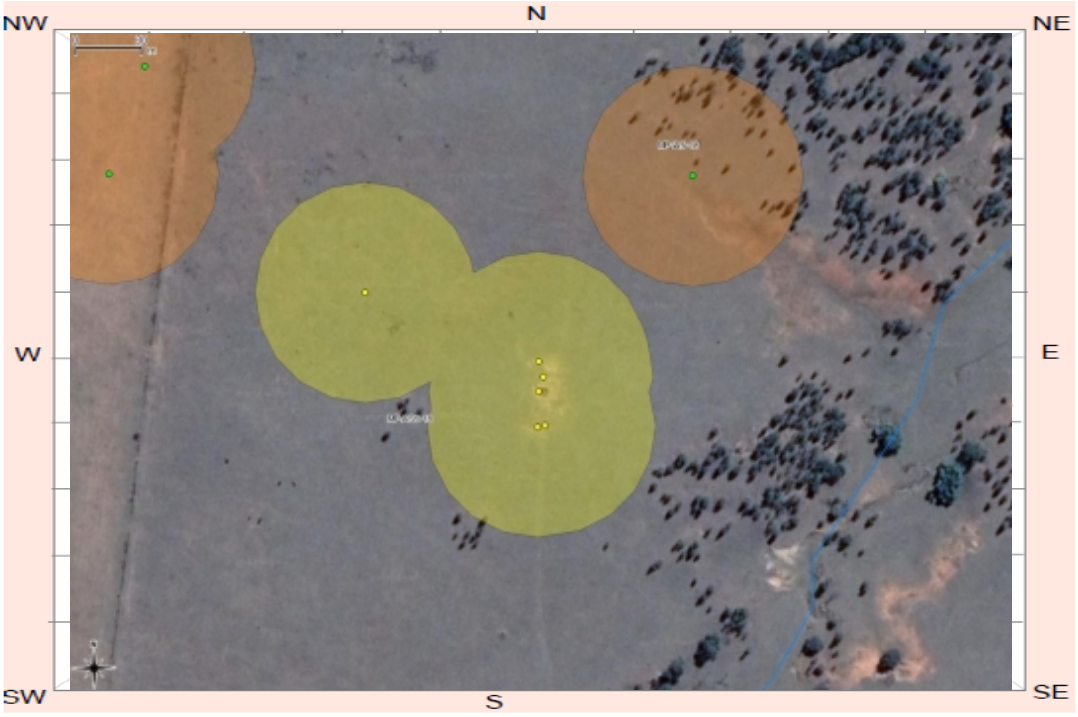
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

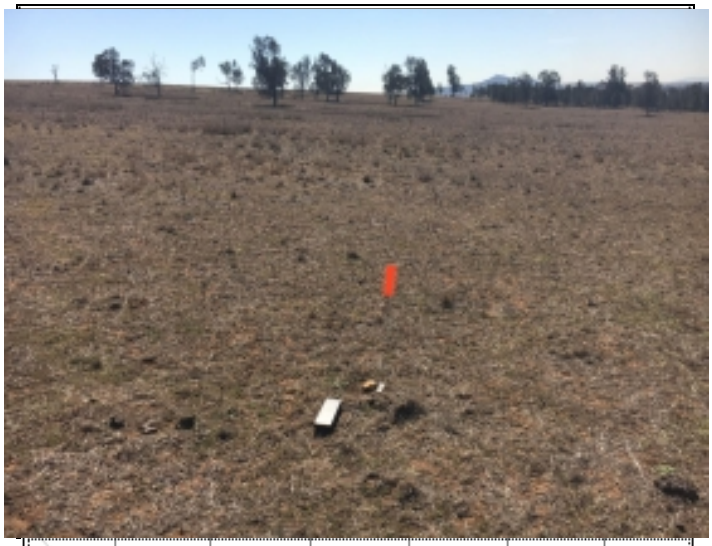
Description:

Other Site Info:

Site plan



Site photographs



Description: Site location

Description:

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5883 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-IA4-18

Easting: 294804 **Northing:** 6409754 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

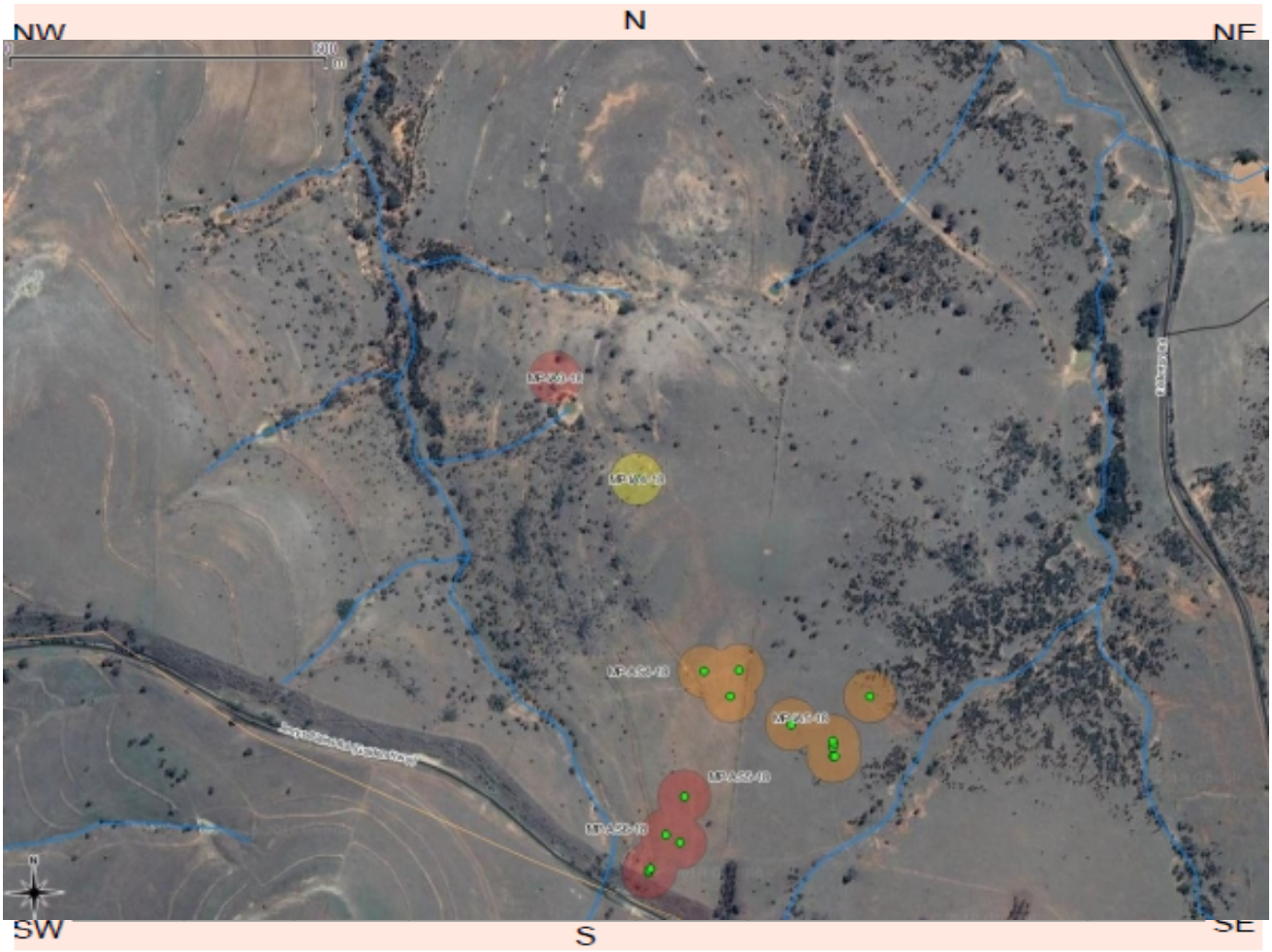
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 180 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 840m north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x silcrete proximal flake

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefact location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5884 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-IA19-18

Easting: 300460 **Northing:** 6409287 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

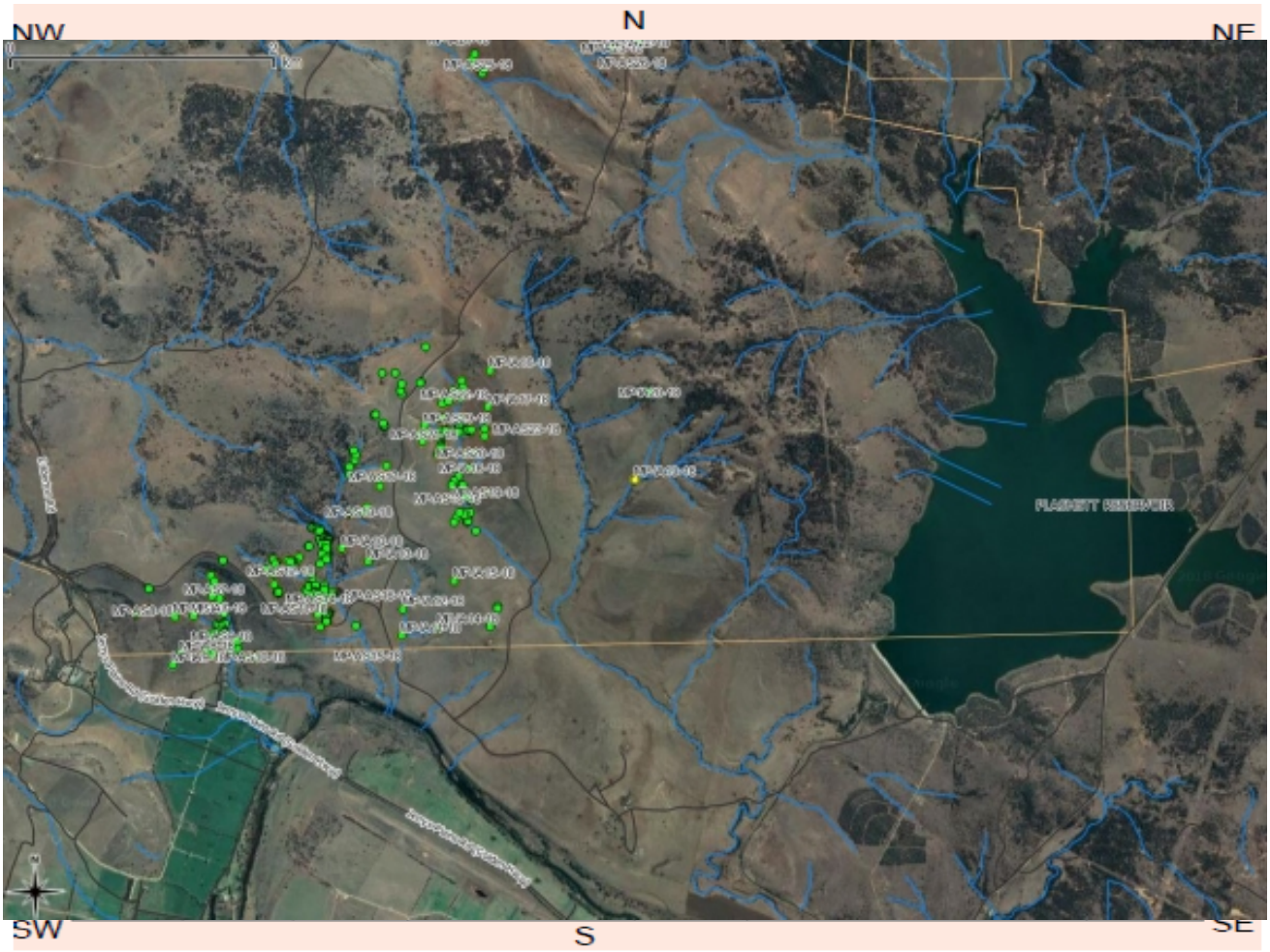
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 10 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 3.3 km north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x tuff complete flake

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

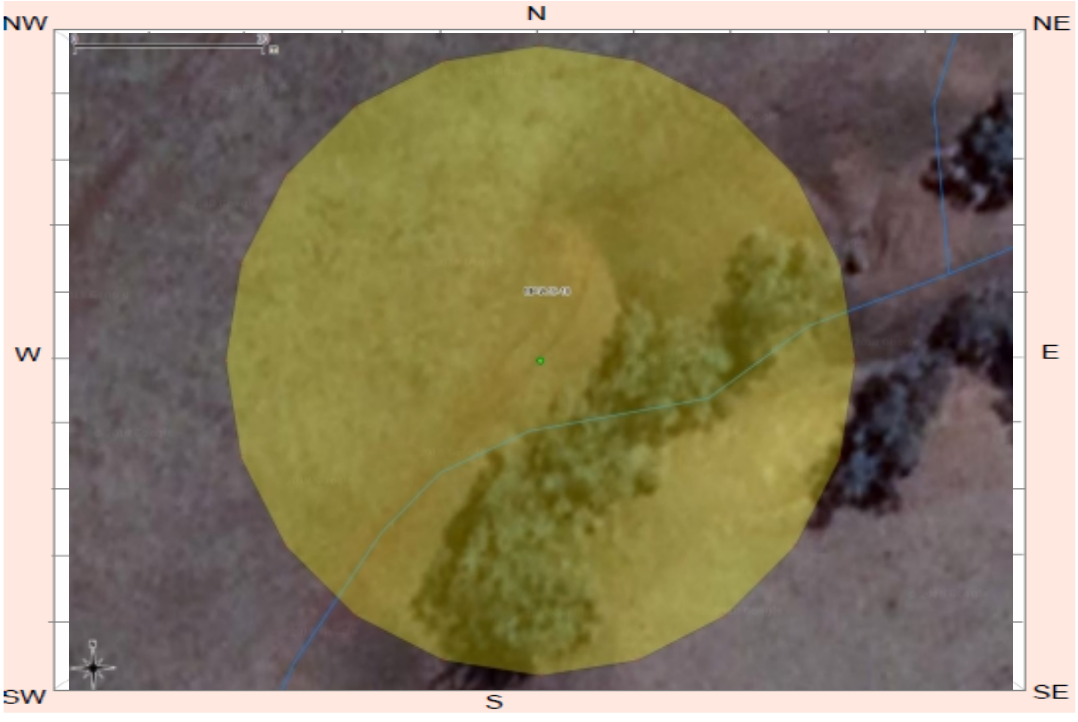
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefact location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5885 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-AS4-18

Easting: 294968 **Northing:** 6409377 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title Mr. **Surname** Oakes **First name** Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

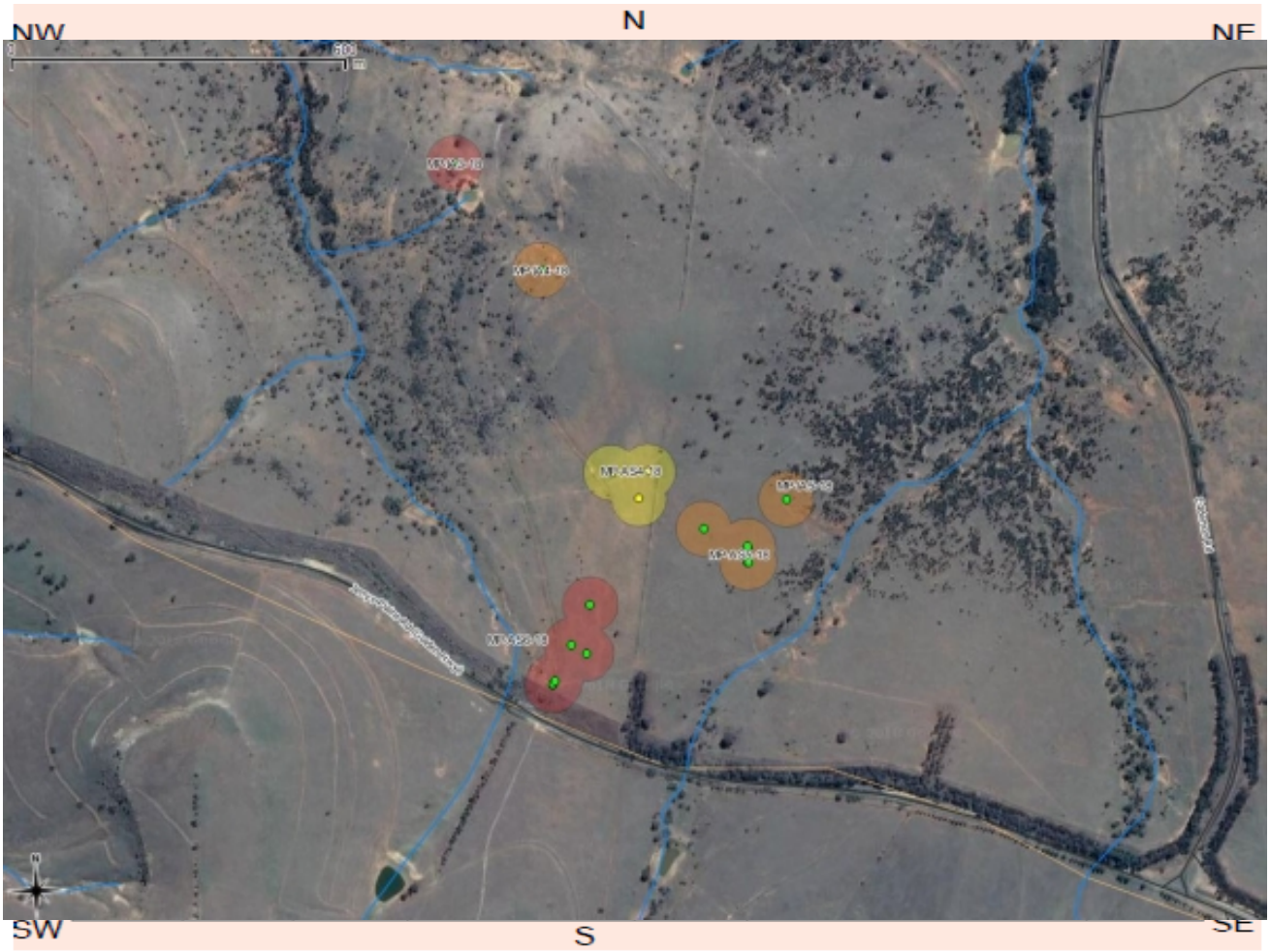
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 320 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 500 m north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Erosion

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	3	160	130				

Description:

Artefact scatter comprising 2 x tuff complete flakes and 1 silcrete flake shatter

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

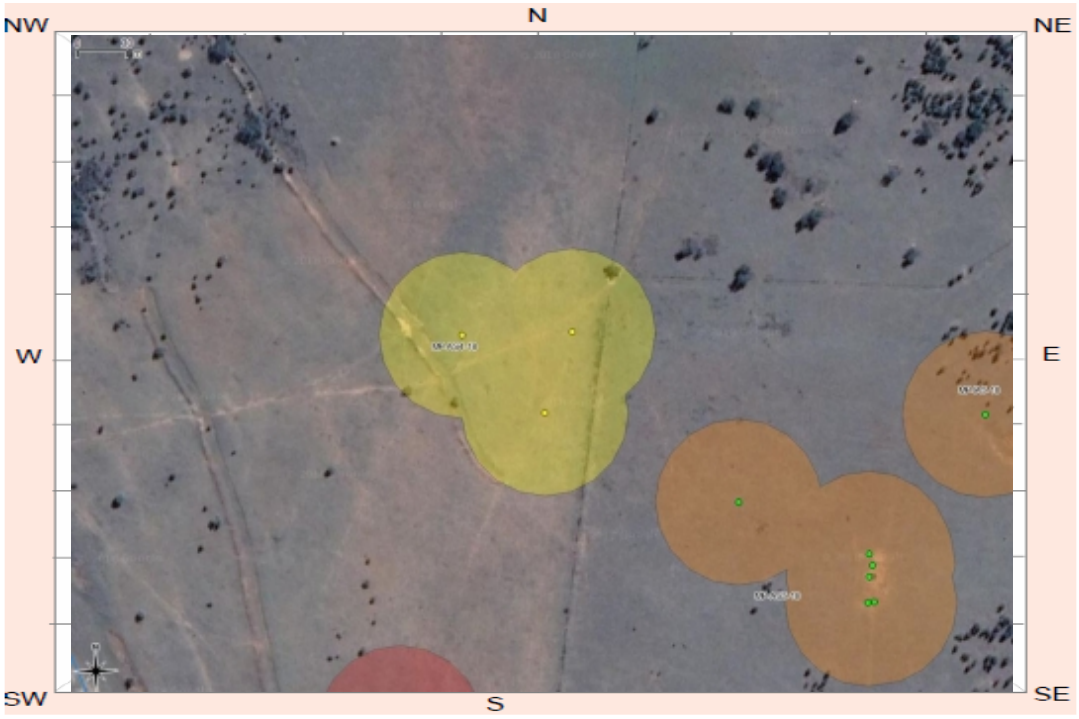
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Site location



Description: Sample artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5886 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-IA16-18

Easting: 299362 **Northing:** 6410111 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

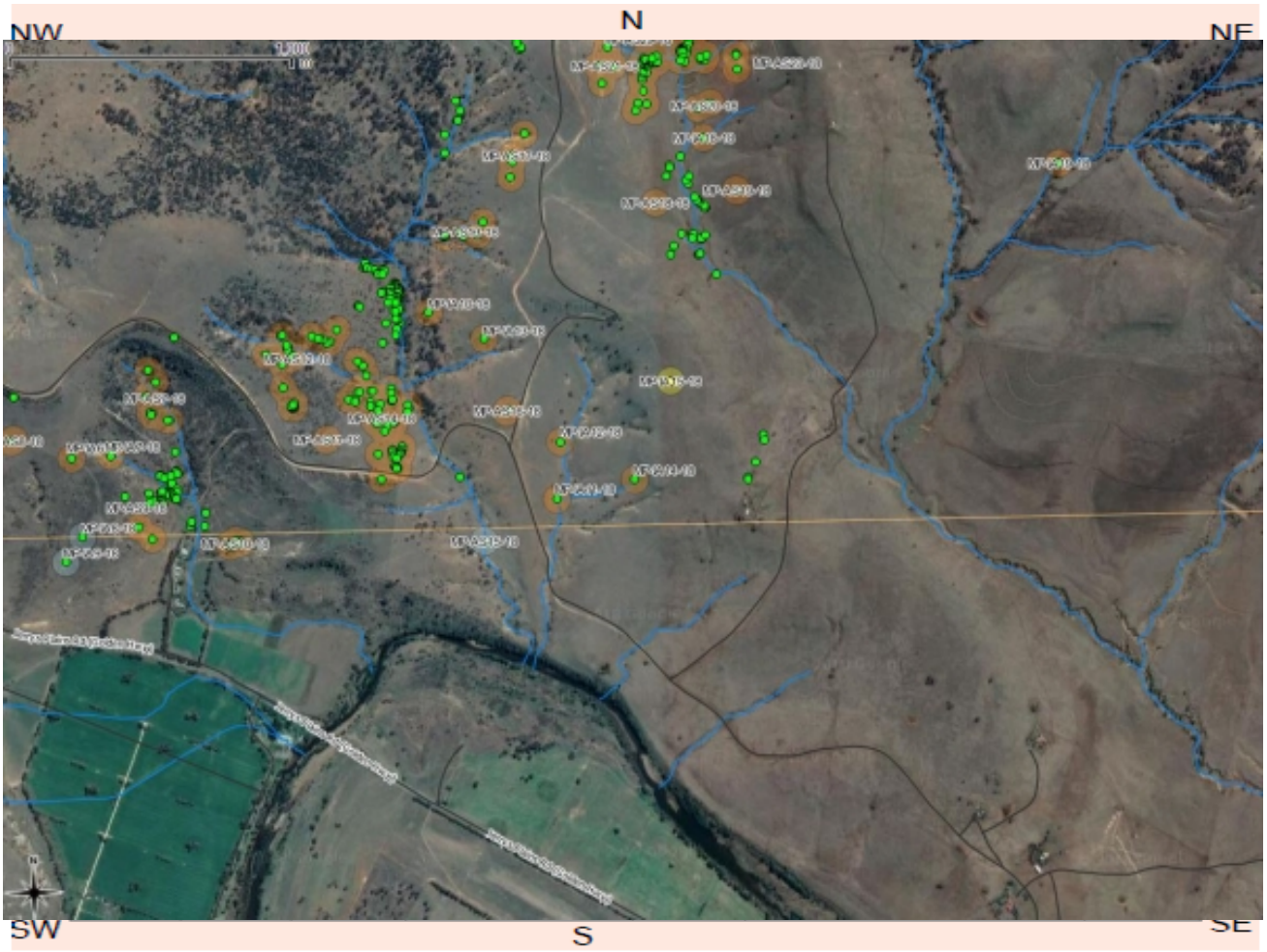
Land Form Unit: Crest **Vegetation:** Cleared

Distance to Water (m): 320 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 3.4 km north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x tuff complete flake

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

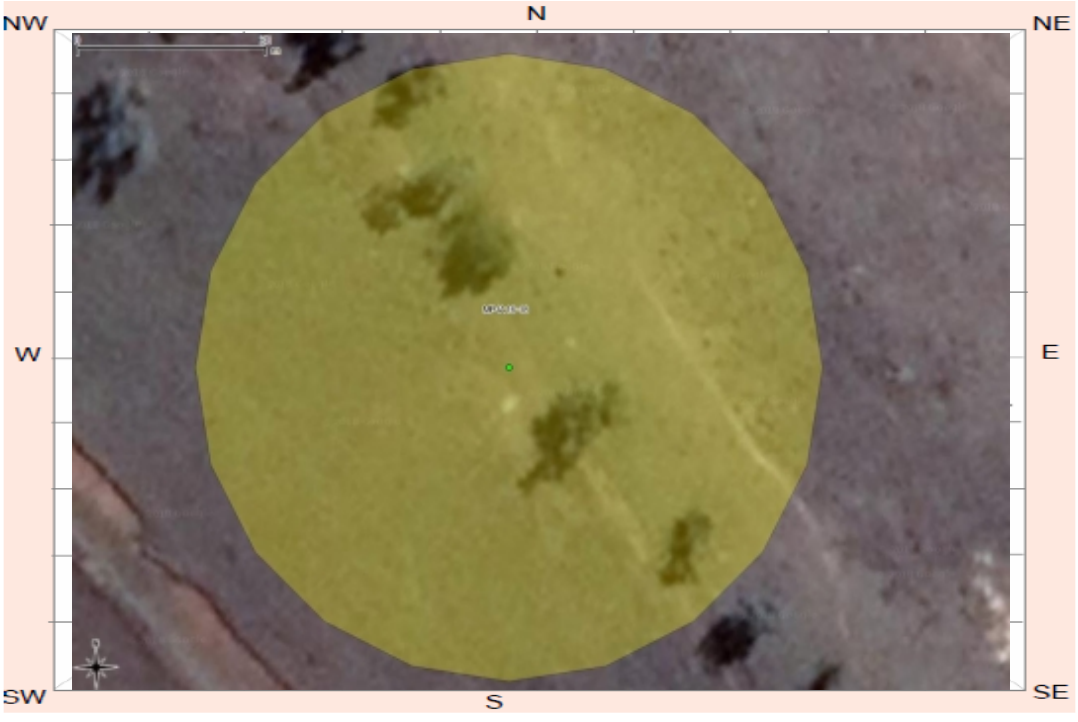
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefact location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5887 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-IA17-18

Easting: 299348 **Northing:** 6409834 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

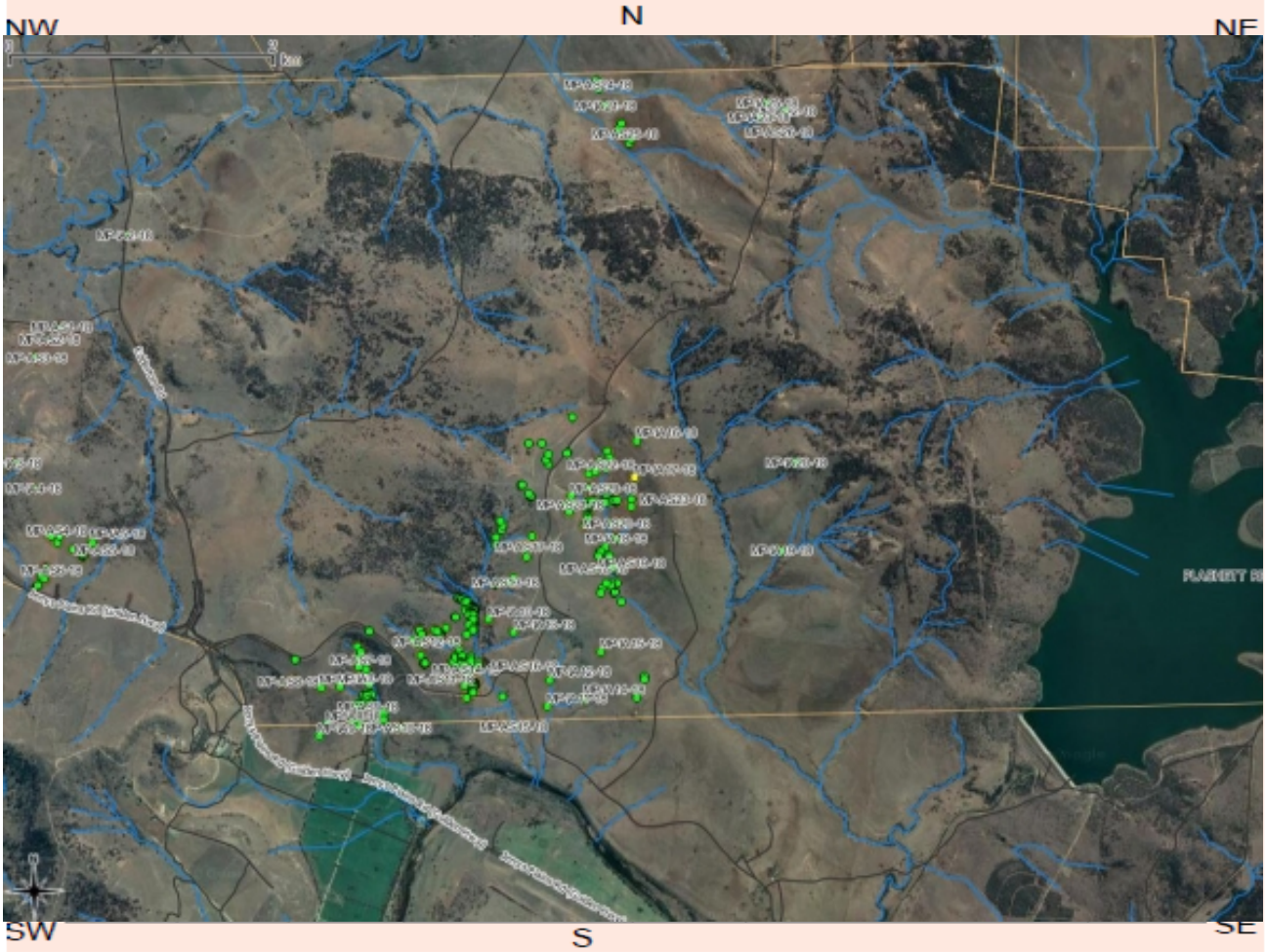
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 240 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 3.3 km north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
1.	Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x tuff flake shatter fragment

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
2.								

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

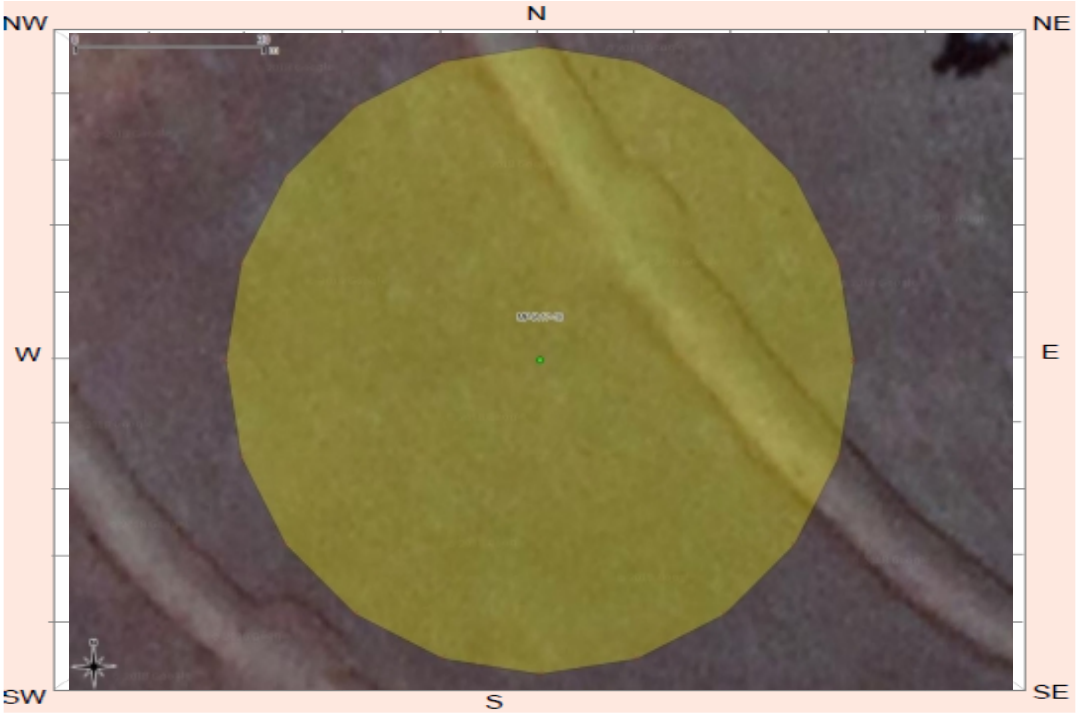
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefact location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5888 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-IA15-18

Easting: 299092 **Northing:** 6408519 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

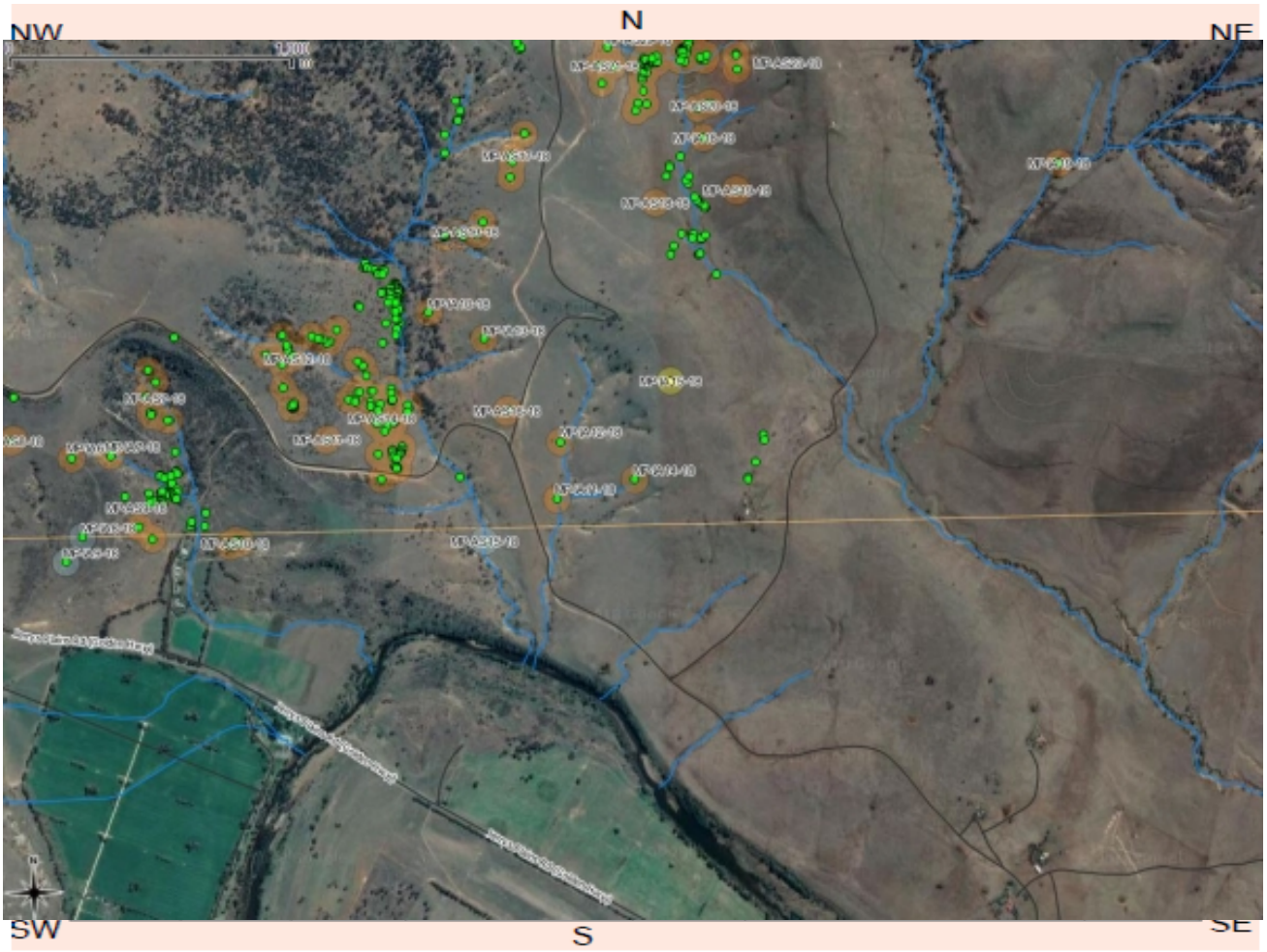
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 280 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 1.9 km north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x tuff complete flake

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

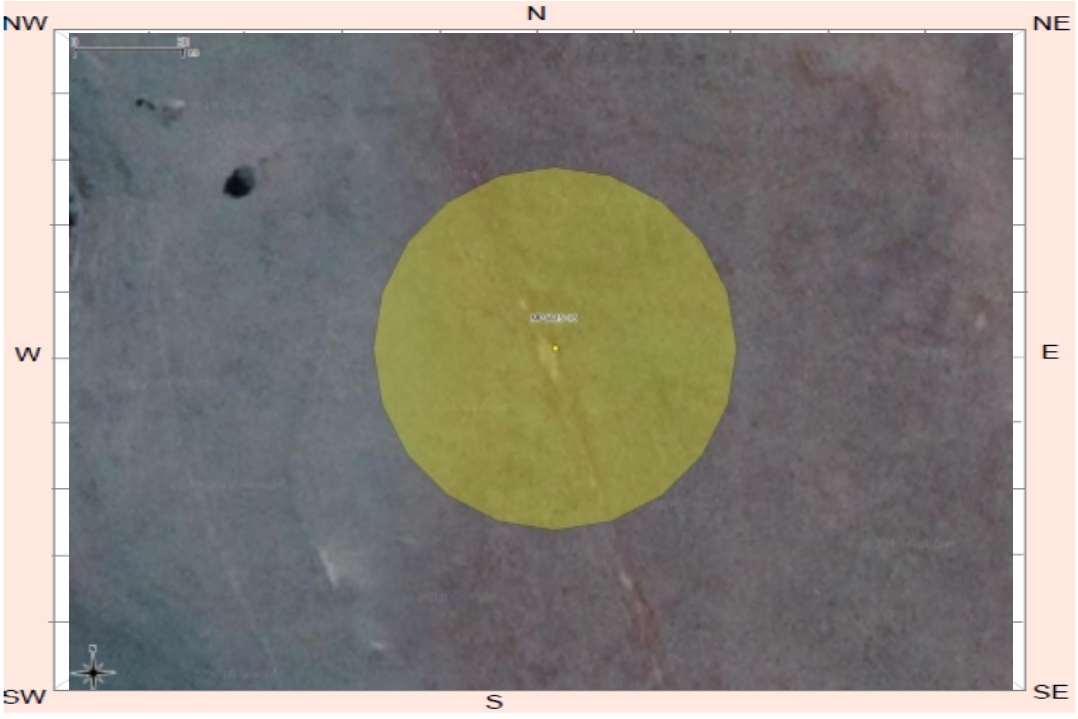
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefact location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5889 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-IA14-18

Easting: 298967 **Northing:** 6408171 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

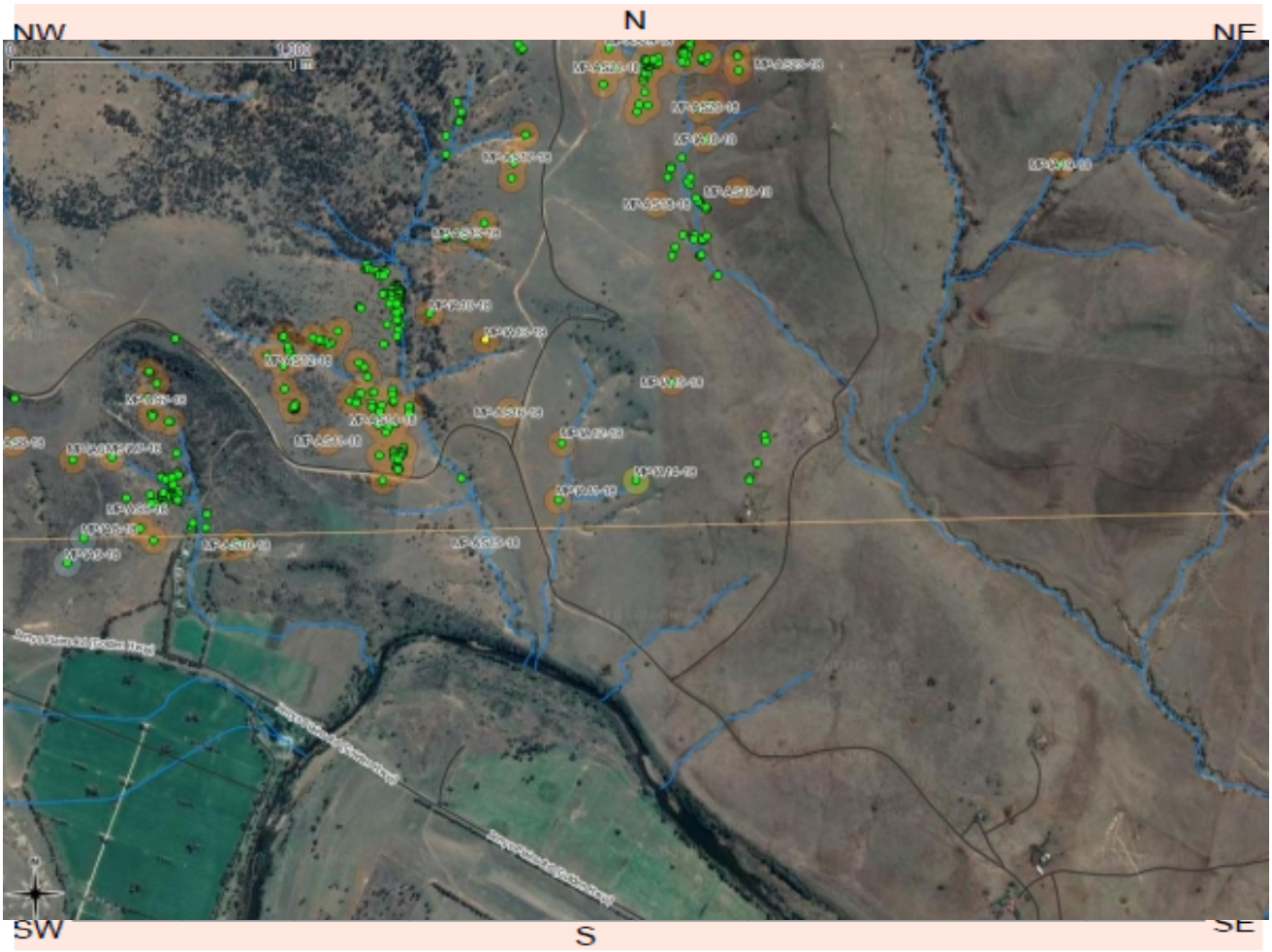
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 50 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 1.8 km north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x tuff unidirectional core

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

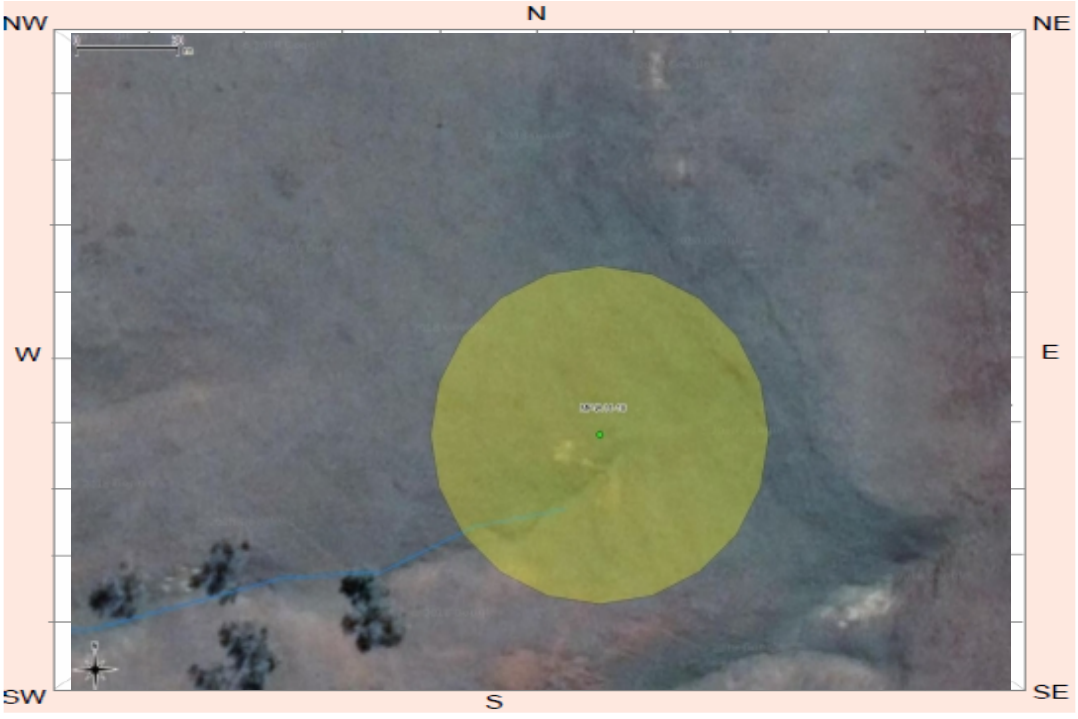
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefact location

Description:

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5890 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-IA13-18

Easting: 298435 **Northing:** 6408666 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

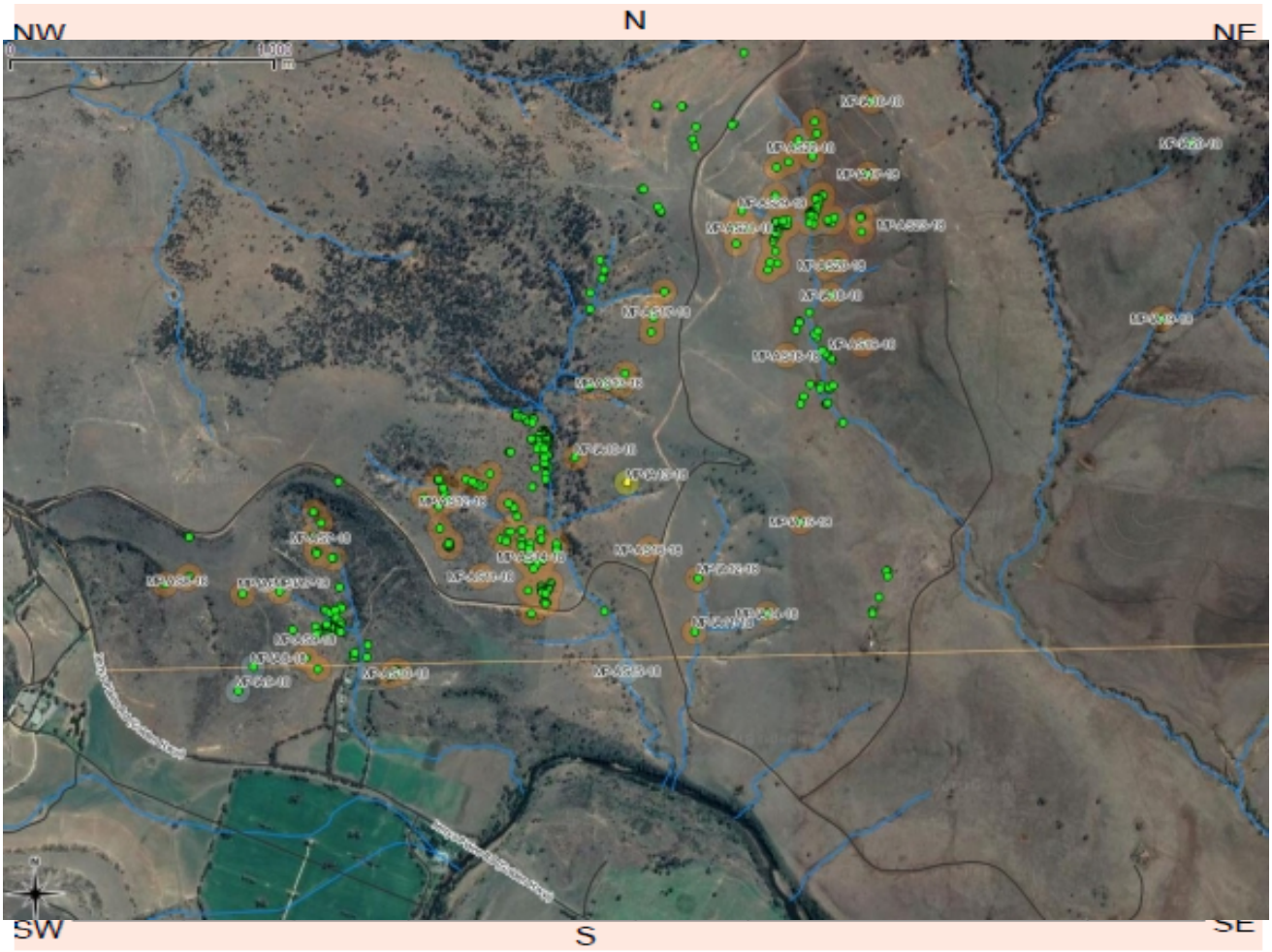
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 50 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 1.7km north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Poor

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x basalt axe

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

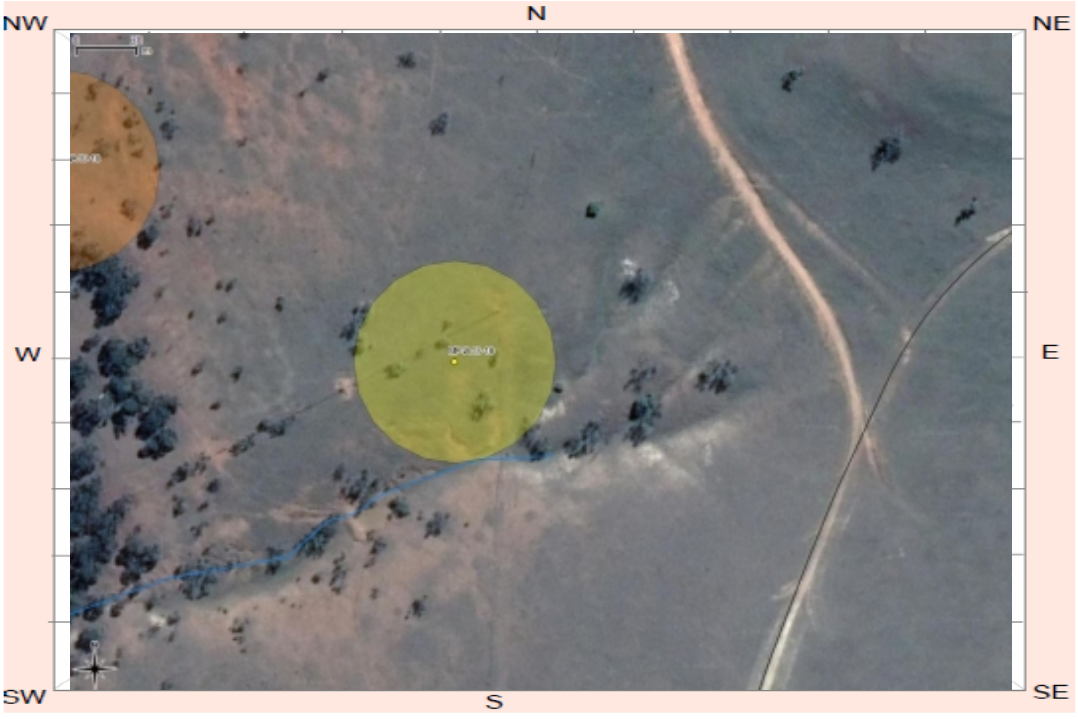
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefact location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5891 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-IA11-18

Easting: 298692 **Northing:** 6408101 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

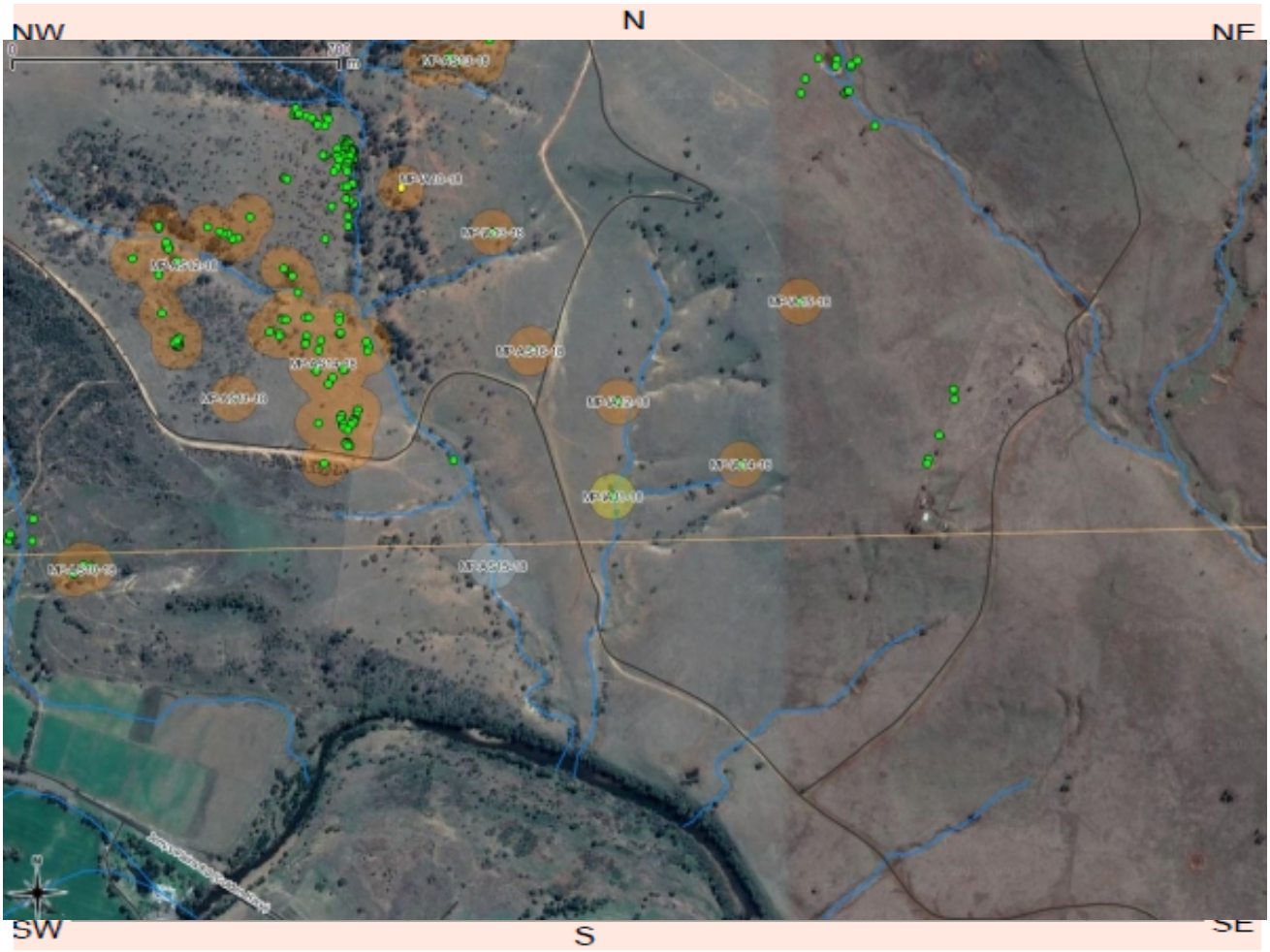
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 10 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 1.2km north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x tuff complete flake

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees			
					Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.								

Description:

Features:		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees			
					Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.								

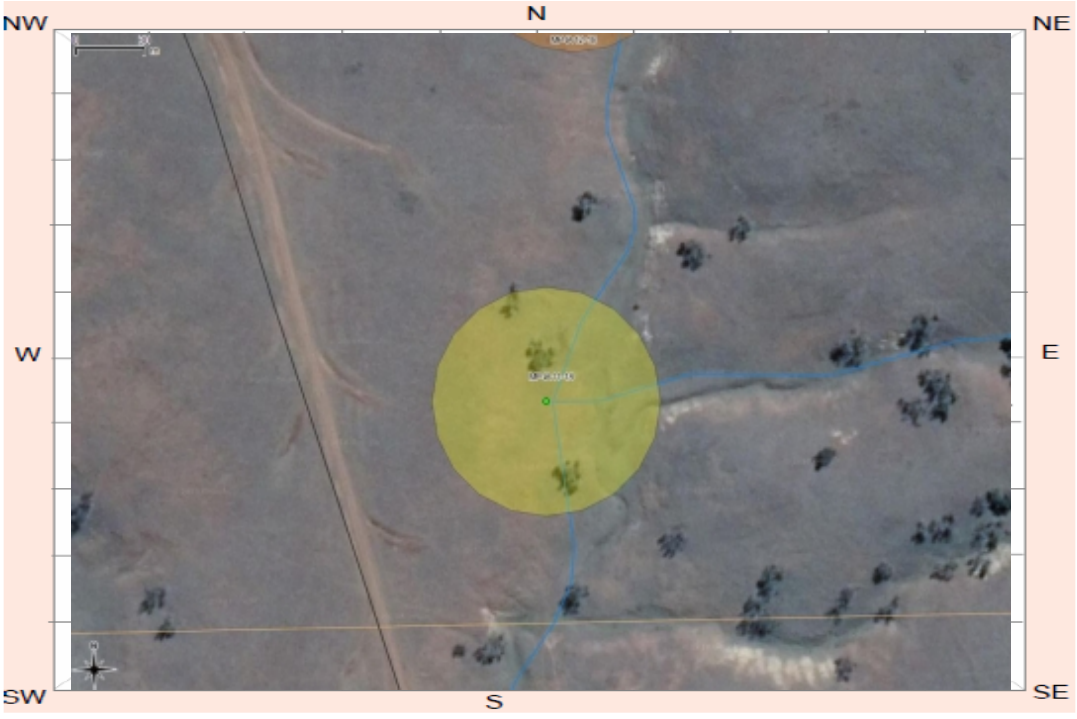
Description:

Features:		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees			
					Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.								

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefact



Description: Artefact location

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5892 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-IA12-18

Easting: 298704 **Northing:** 6408304 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

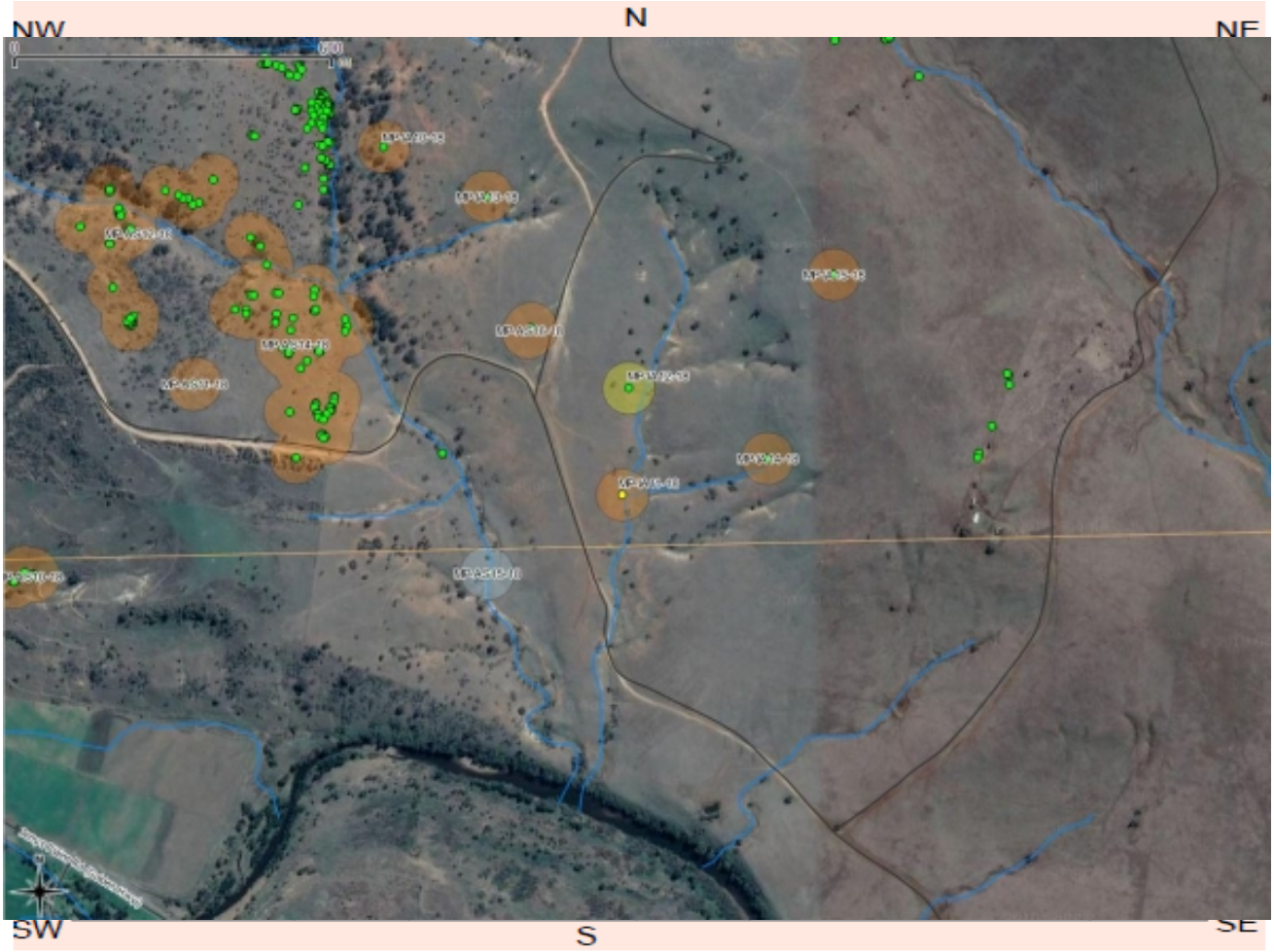
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 50 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 1.4km north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x silcrete unidirectional core

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

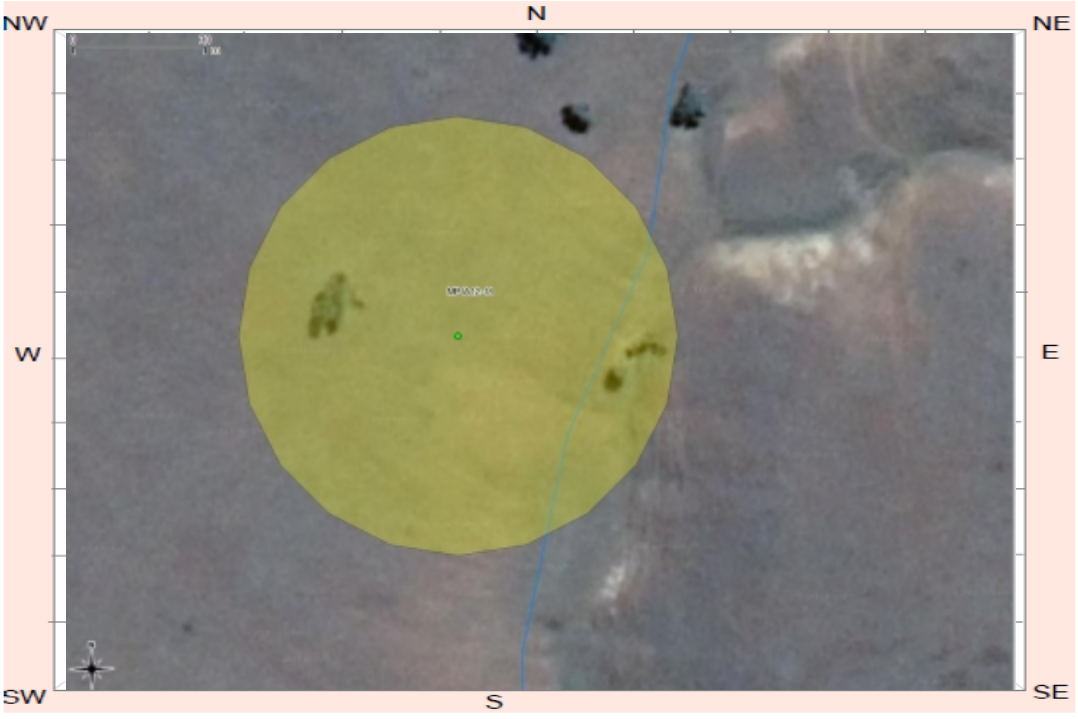
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefact location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5893 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-IA10-18

Easting: 298239 **Northing:** 6408760 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

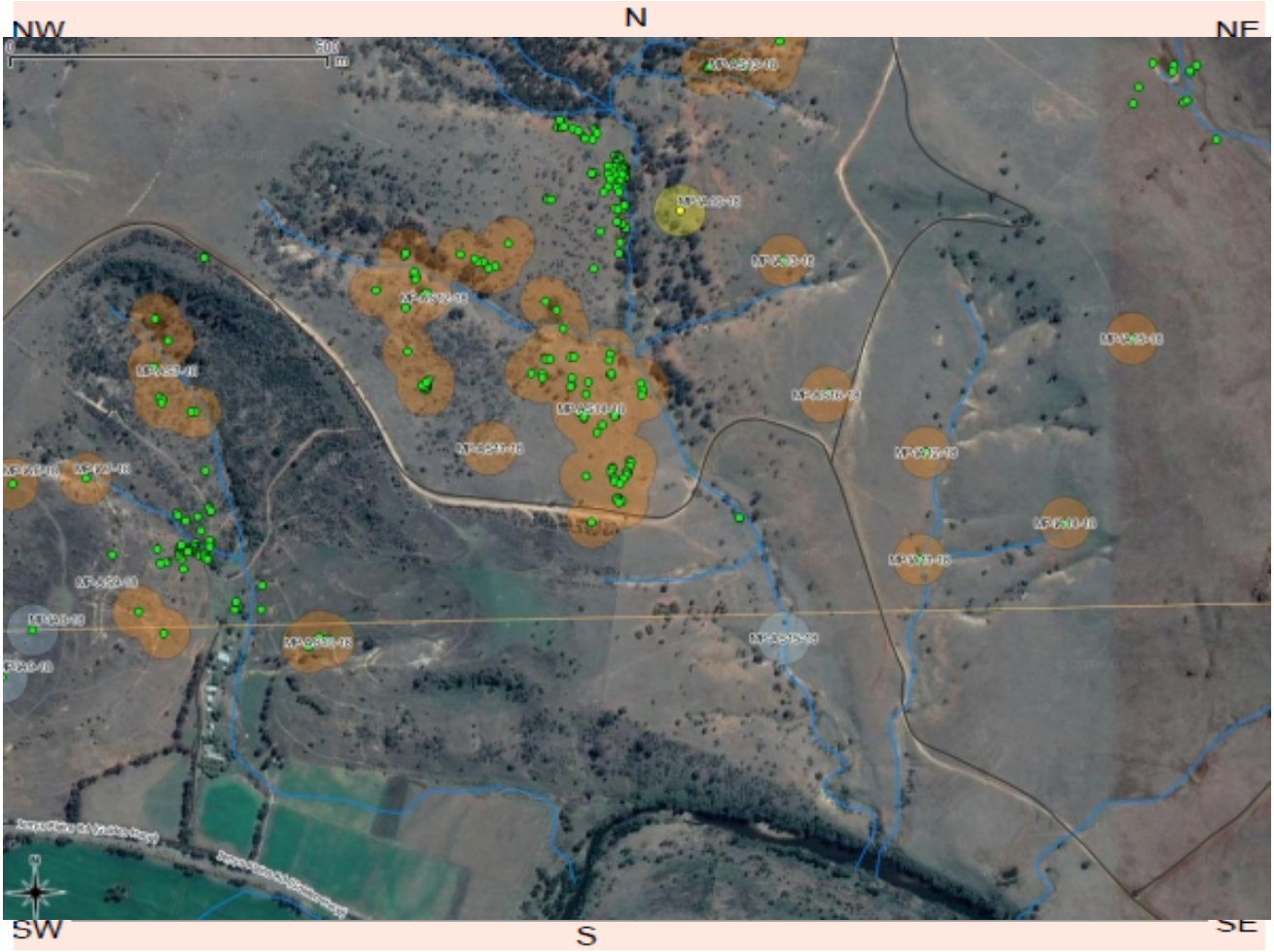
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 100 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 1.7km north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Poor

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x tuff unidirectional core

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

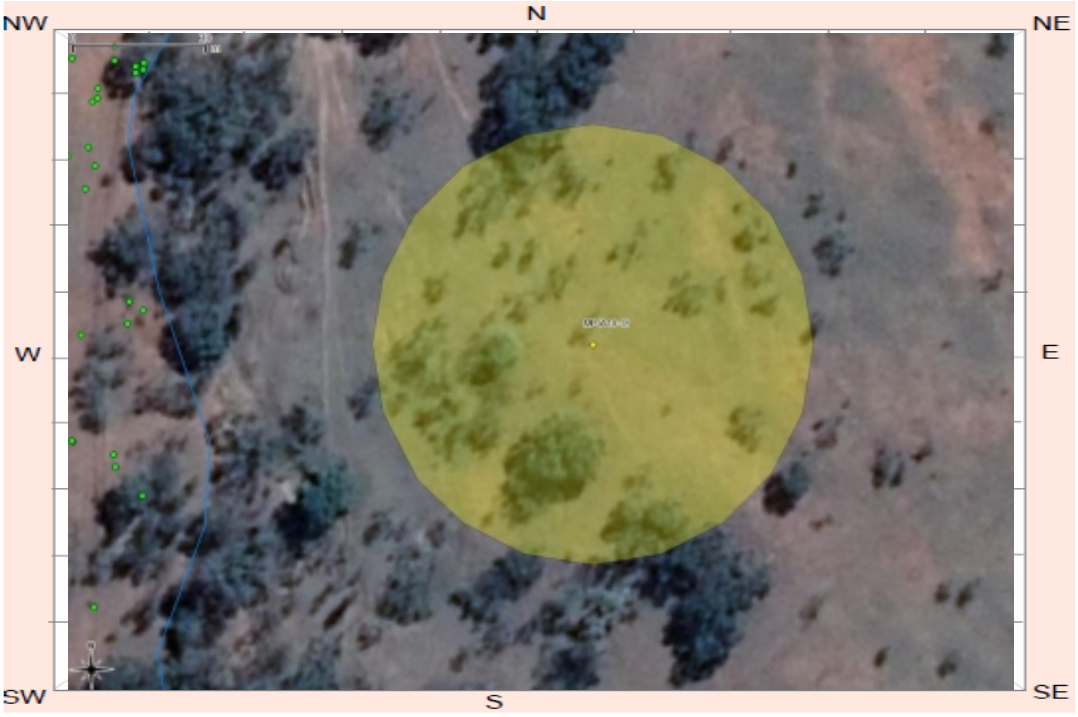
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefact



Description: Artefact location

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5894 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-IA9-18

Easting: 296961 **Northing:** 6407878 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

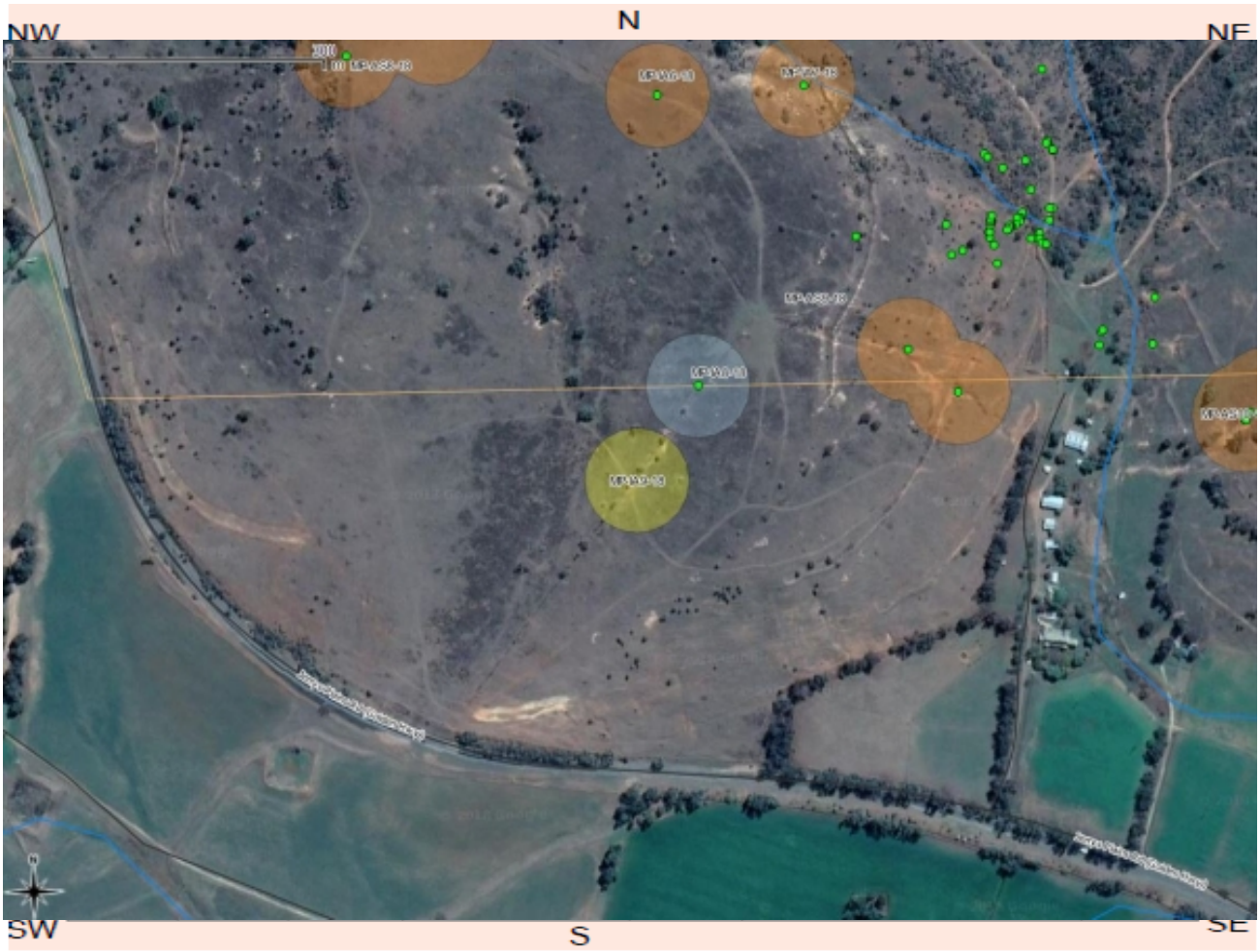
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 440 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 275m north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x tuff flake shatter

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

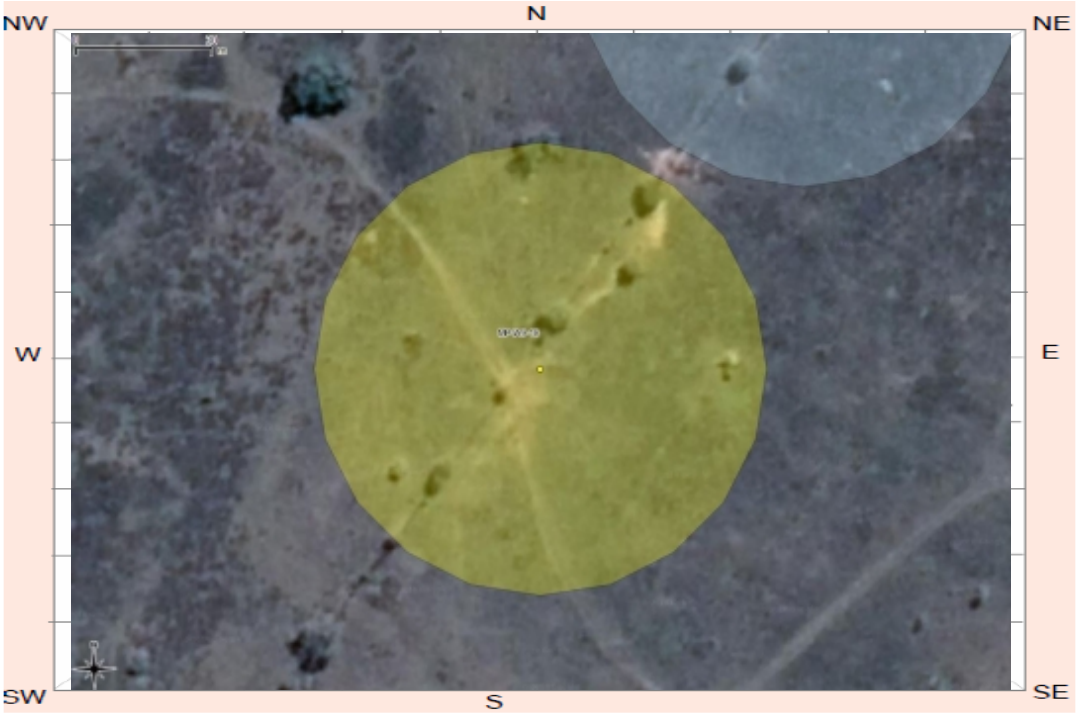
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefact location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5895 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-IA8-18

Easting: 297019 **Northing:** 6407968 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

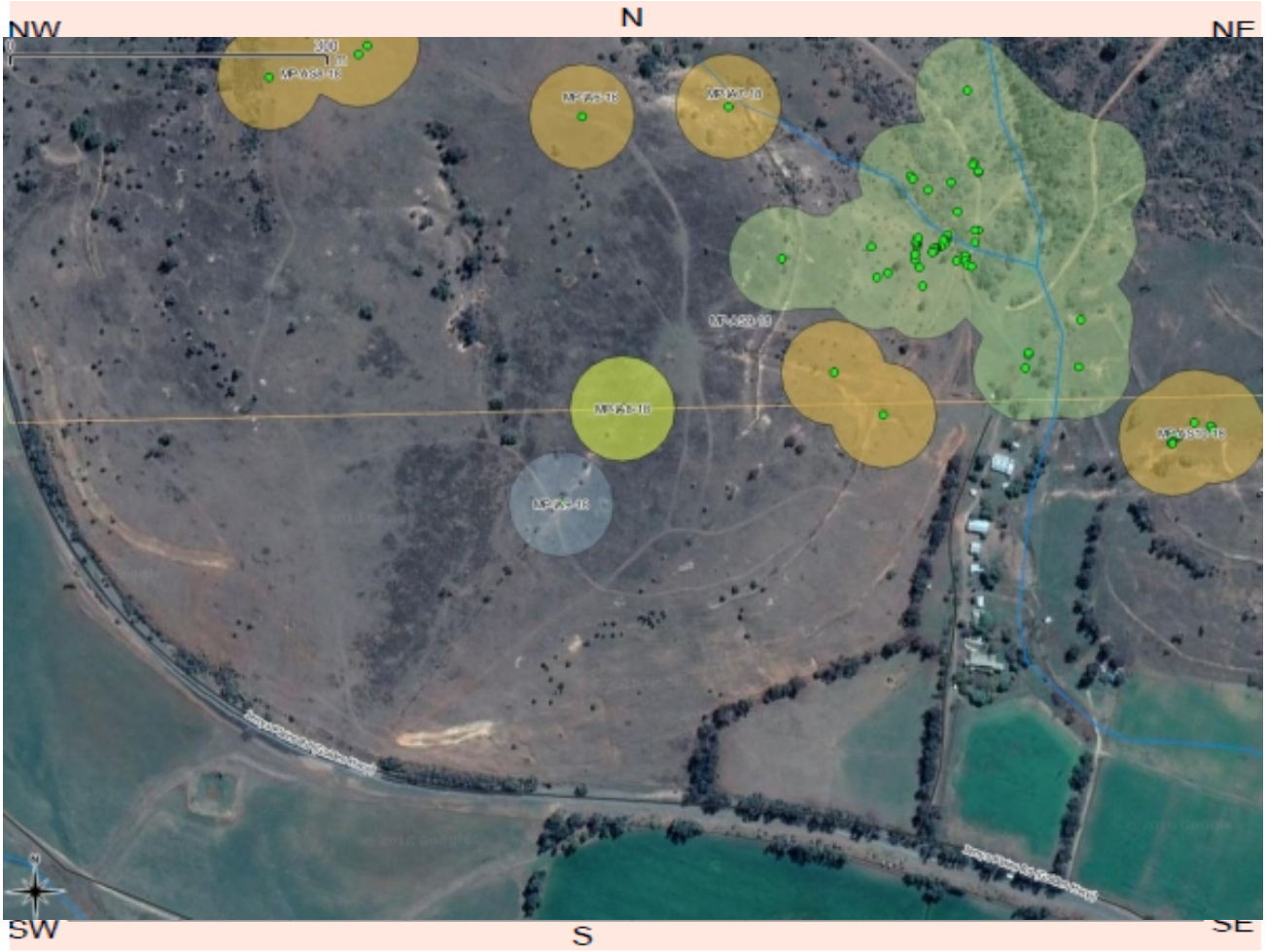
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 395 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 370m east of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x tuff complete flake

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

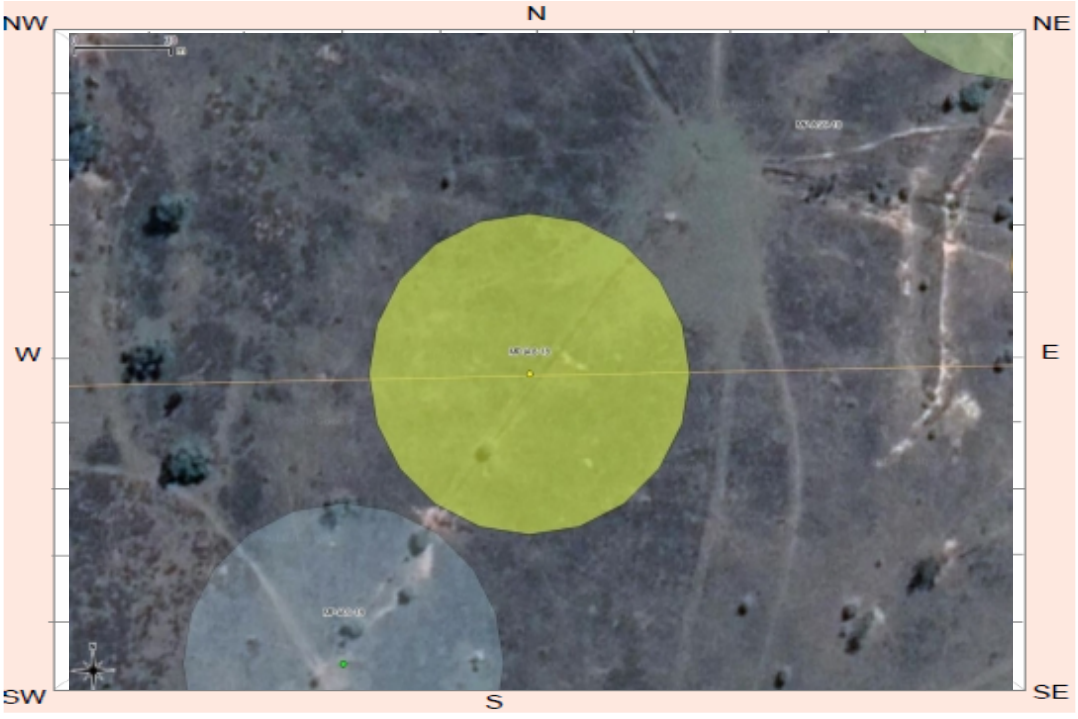
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefact location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5896 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-IA7-18

Easting: 297119 **Northing:** 6408254 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title Mr. **Surname** Oakes **First name** Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

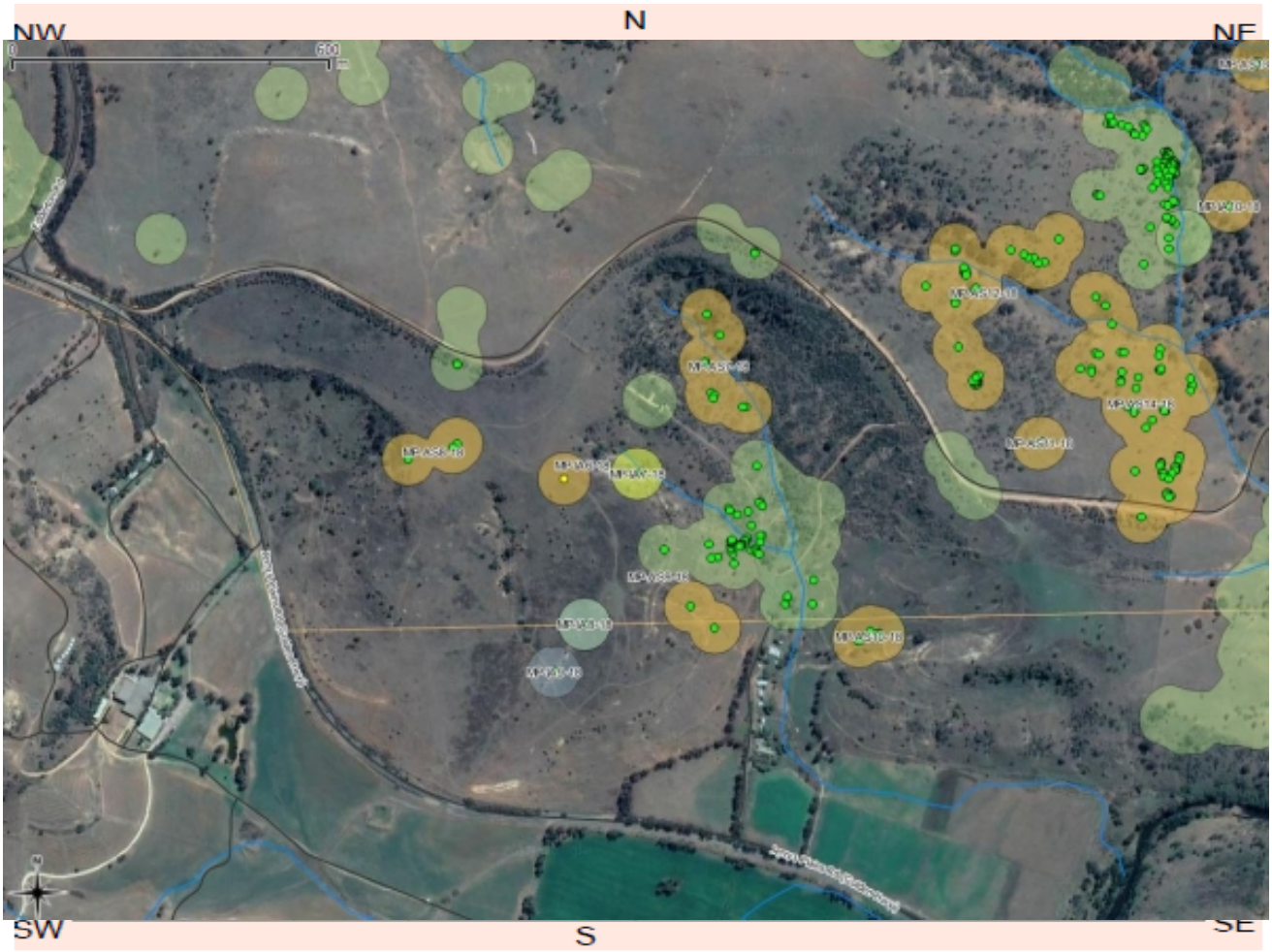
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 10 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 740m east of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x tuff unidirectional core

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

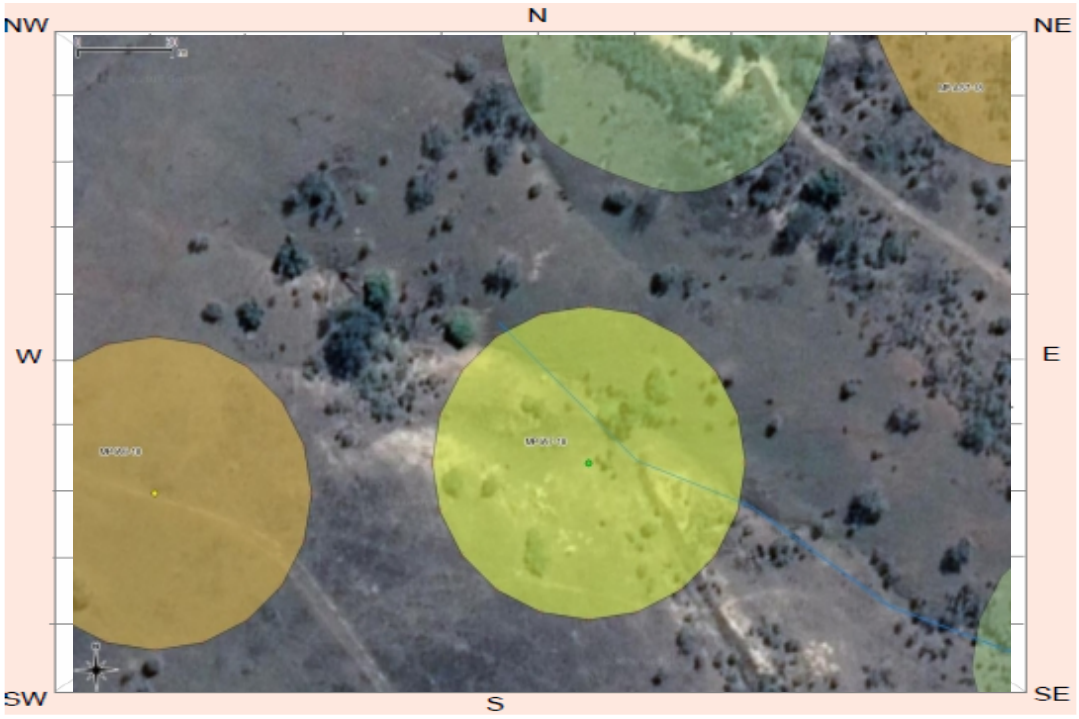
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefact location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5897 **Date recorded:** 15-01-2019

Site Location Information

Site name: MP-IA6-18

Easting: 296981 **Northing:** 6408244 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

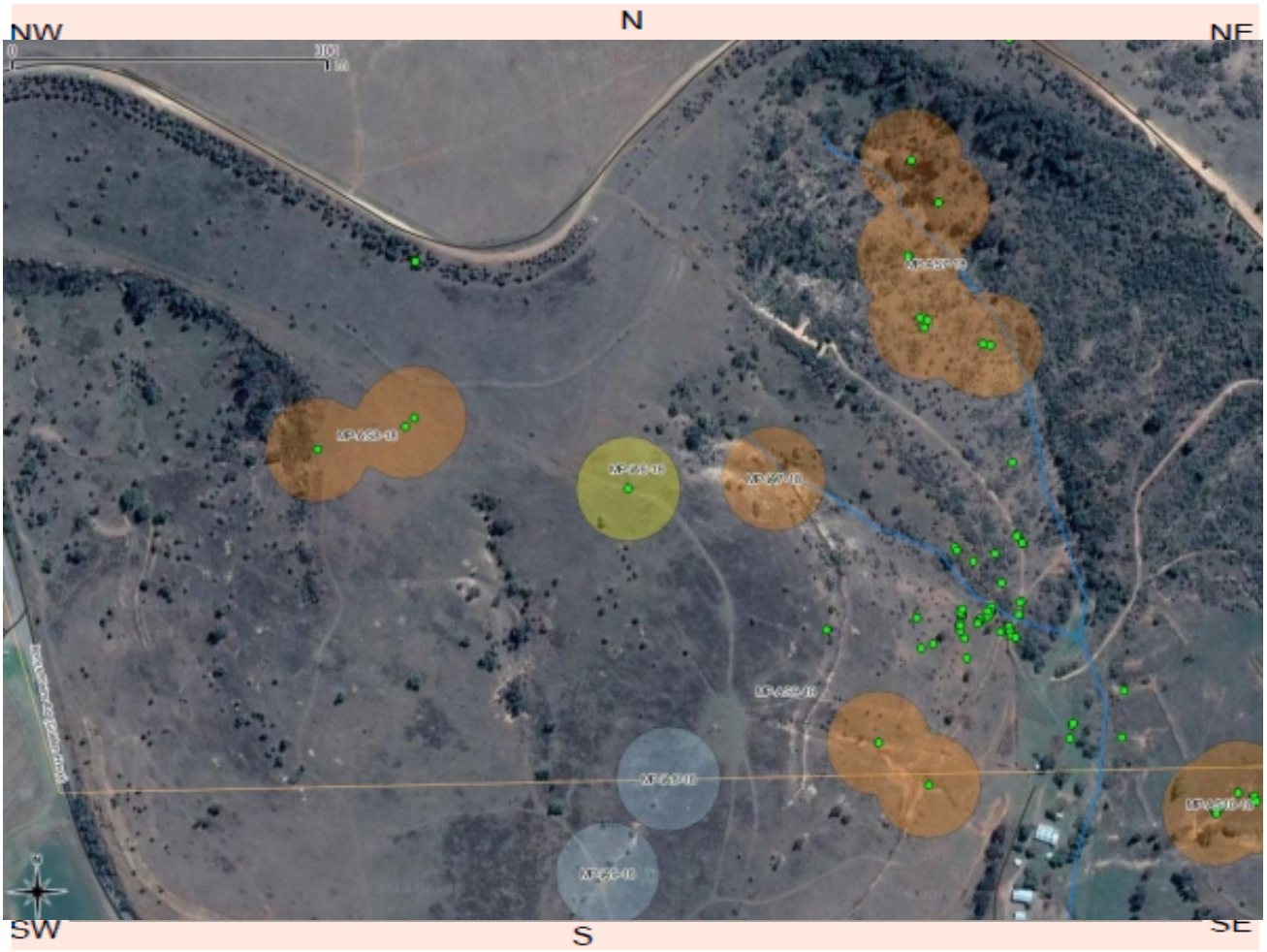
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 120 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 580m east of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x tuff multidirectional core

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

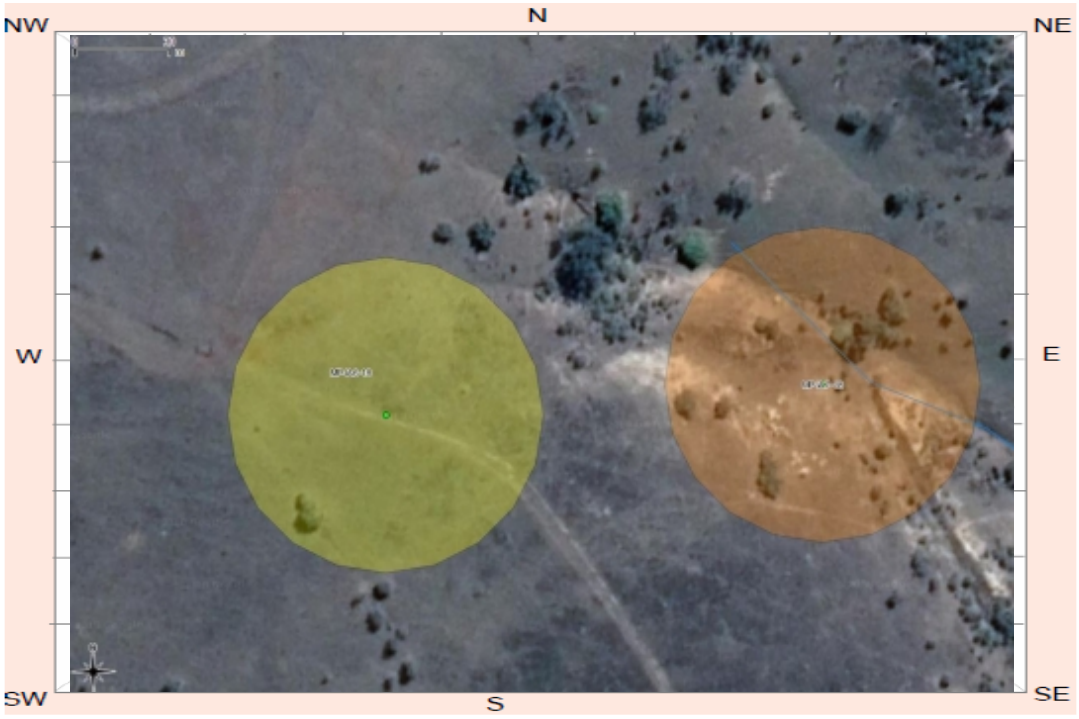
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefact location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5898 **Date recorded:** 17-01-2019

Site Location Information

Site name: MP-IA20-18

Easting: 300570 **Northing:** 6409949 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 50

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

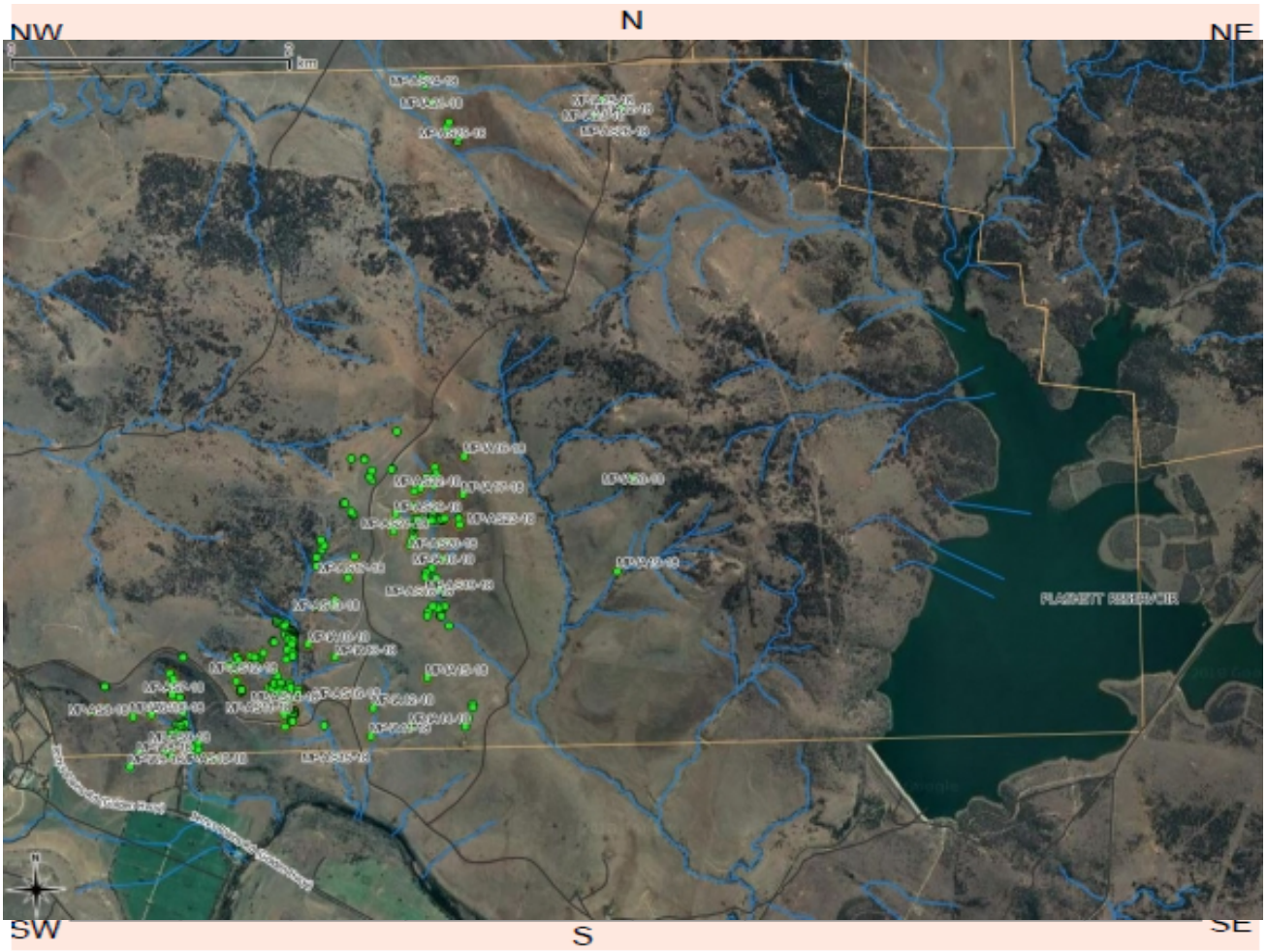
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 120 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 4.1 km north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x silcrete complete flake.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Artefact location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5787 **Date recorded:** 20-06-2018

Site Location Information

Site name: MP-IA1-18

Easting: 296217 **Northing:** 6408699 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 3

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 420 **Primary Report:** AECOM (2018) Maxwell Project Soils Due Diligence

How to get to the site: The site is located approximately 275 east of Edderton Road, near its junction with the Golden Highway, in a cleared paddock.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Good

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	1	1				

Description:

A single silicified tuff complete flake

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: View south of location of MP-IA1-18



Description: Silicified tuff complete flake

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5840 **Date recorded:** 19-11-2018

Site Location Information

Site name: MP-AS1-18

Easting: 295011 **Northing:** 6410974 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 3

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Floodplain **Land Use:** Pastoral/Grazing

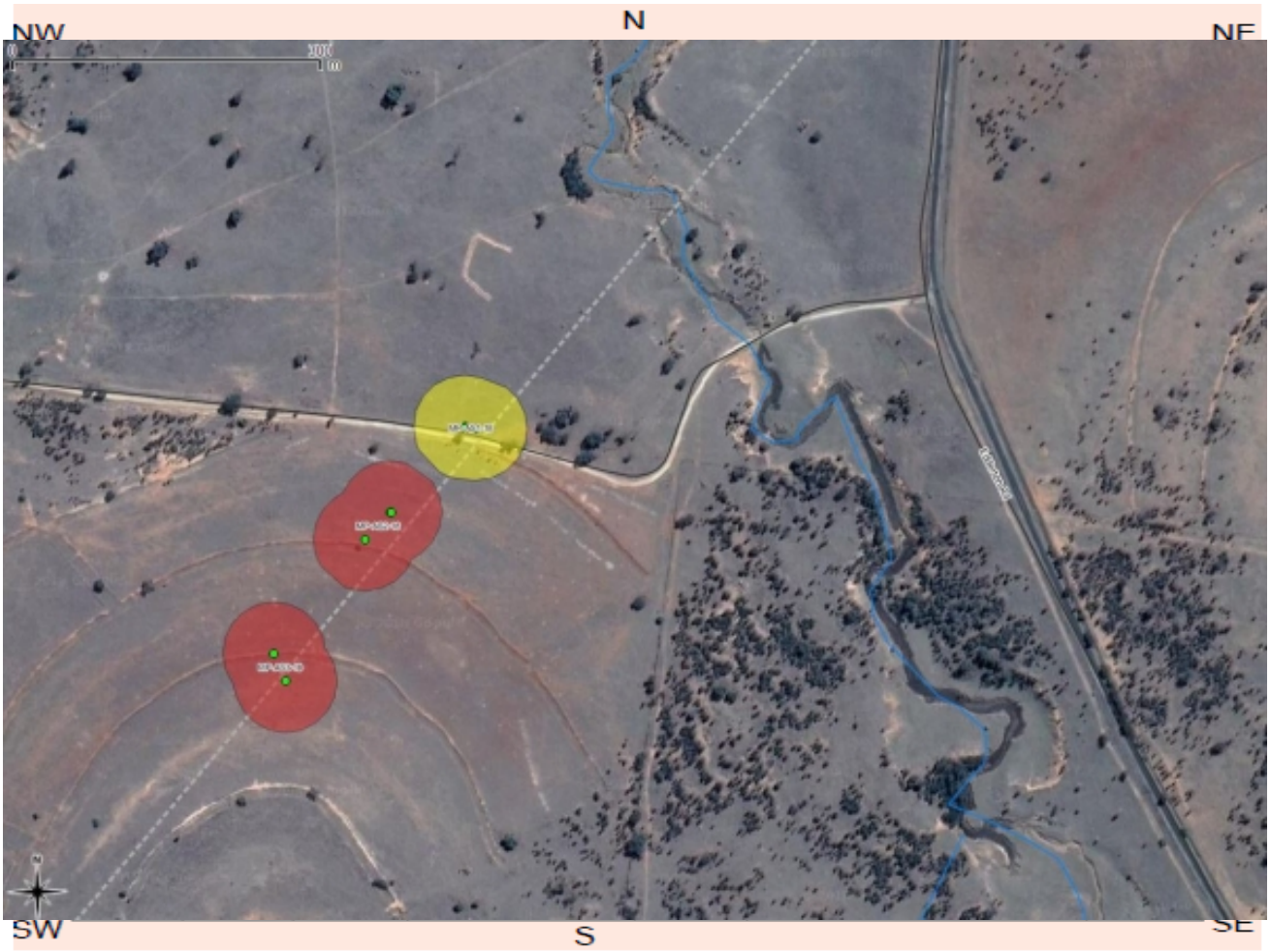
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 280 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 500m west of Edderton Road on the Bowfield property adjacent to their driveway.

Other site information: Site lies adjacent to driveway. No PAD anticipated.

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	3	11	3				

Description:

Open artefact scatter comprising three artefact 1 x tuff complete flake, 1 x angular shatter piece and 1 x flake shatter fragment

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info: Site lies adjacent to driveway. No PAD anticipated.

Site plan



Site photographs



Description: Site location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5841 **Date recorded:** 19-11-2018

Site Location Information

Site name: MP-AS2-18

Easting: 294921 **Northing:** 6410879 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 3

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title Mr. **Surname** Oakes **First name** Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Floodplain **Land Use:** Pastoral/Grazing

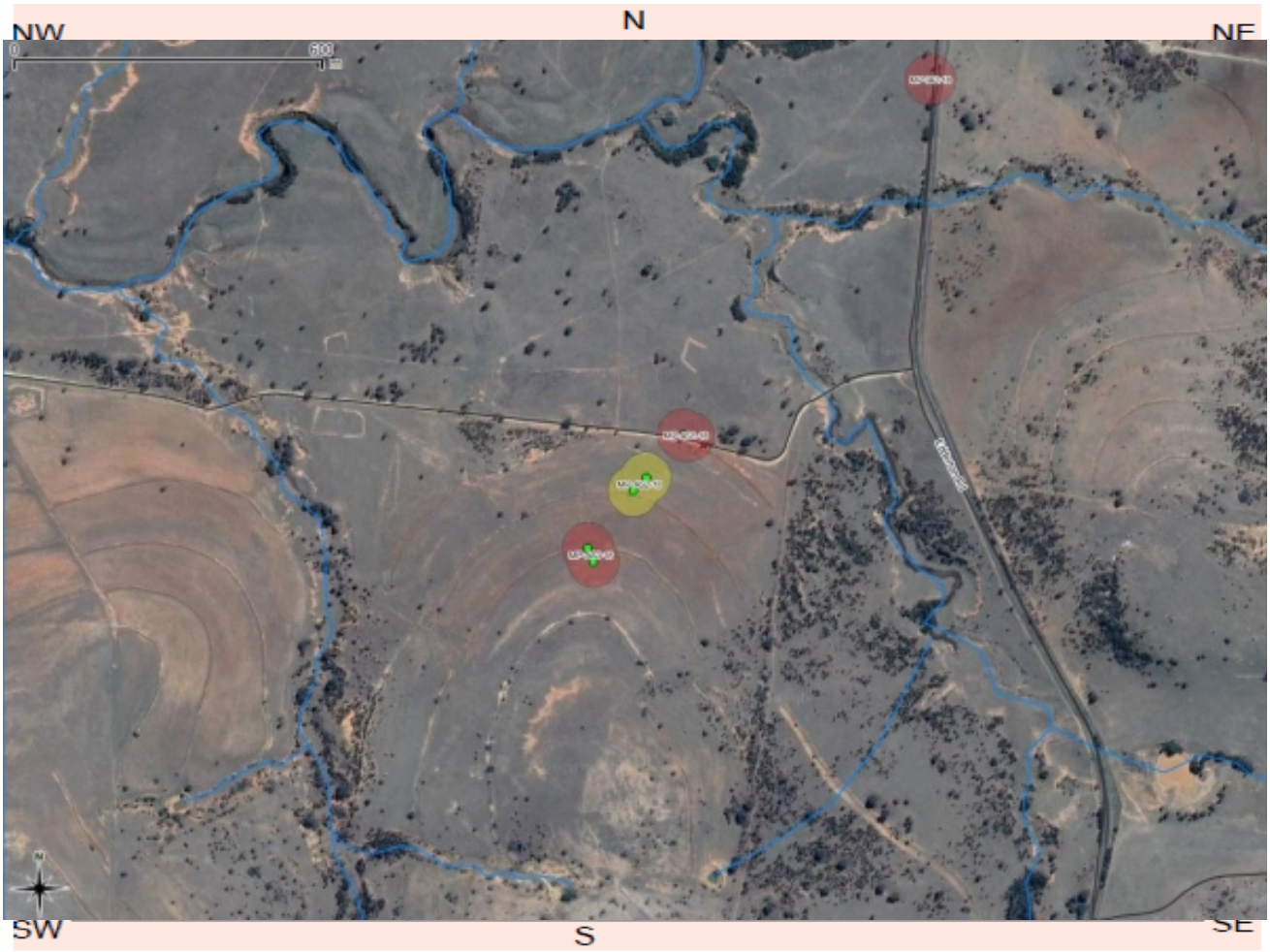
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 300 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 500m west of Edderton Road on the Bowfield property adjacent to their driveway.

Other site information: Site lies adjacent to driveway. No PAD anticipated.

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	3	35	2				

Description:

Open artefact scatter comprising three artefact 1 x tuff complete flake and 2 x flake shatter fragments

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info: Site lies adjacent to driveway. No PAD anticipated.

Site plan



Site photographs



Description: Site Plan



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5842 **Date recorded:** 19-11-2018

Site Location Information

Site name: MP-AS3-18

Easting: 294826 **Northing:** 6410742 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 3

Zone: 56 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

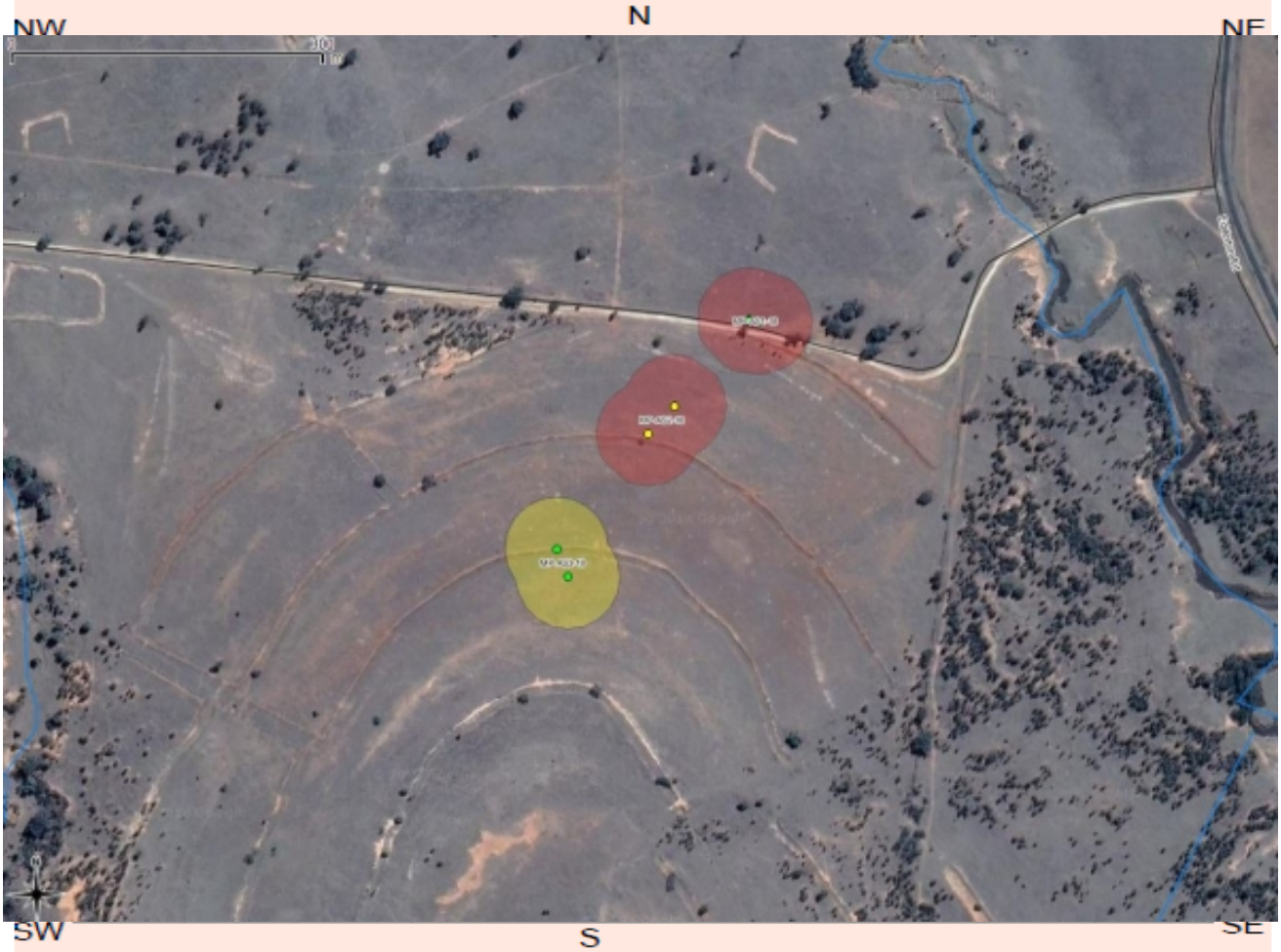
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 600 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 715m west of Edderton Road on the Bowfield property.

Other site information: Site lies on a north facing hill slope. No PAD anticipated.

Site location map



Site contents information

open/closed site: Open

Site condition: Poor

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	2	30	2				

Description:

Open artefact scatter comprising two artefacts 1 x tuff angular shatter and 1 x flake shatter fragments.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

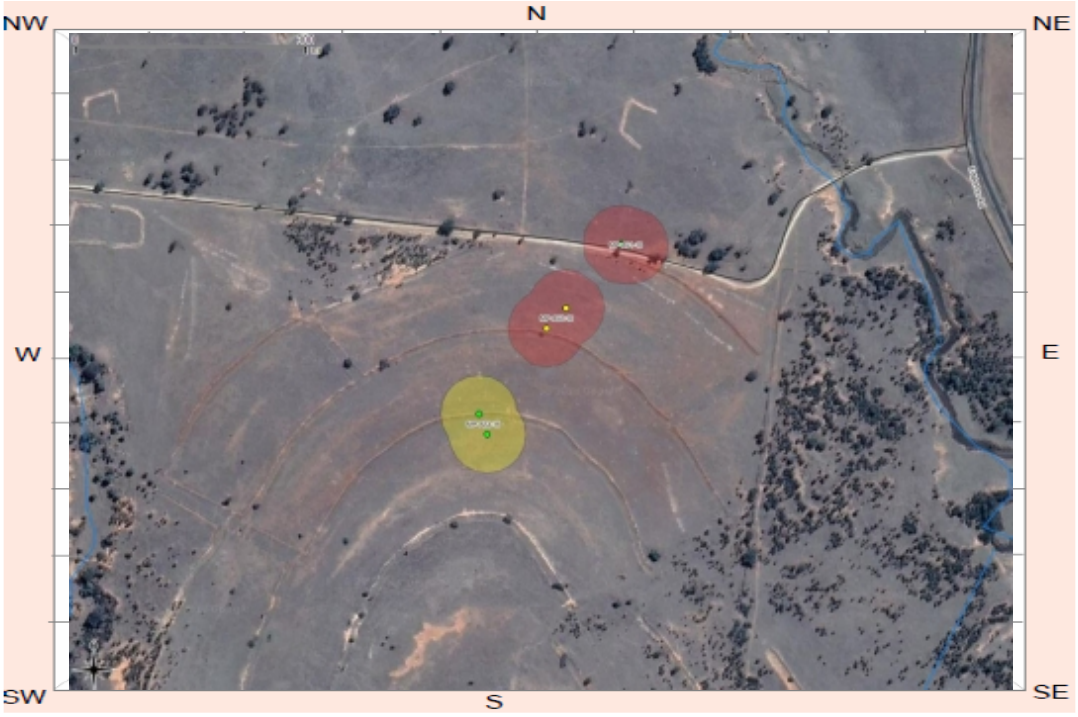
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info: Site lies on a north facing hill slope. No PAD anticipated.

Site plan



Site photographs



Description: Site Location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5843 **Date recorded:** 19-11-2018

Site Location Information

Site name: MP-AS6-18

Easting: 294865 **Northing:** 6409078 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 3

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

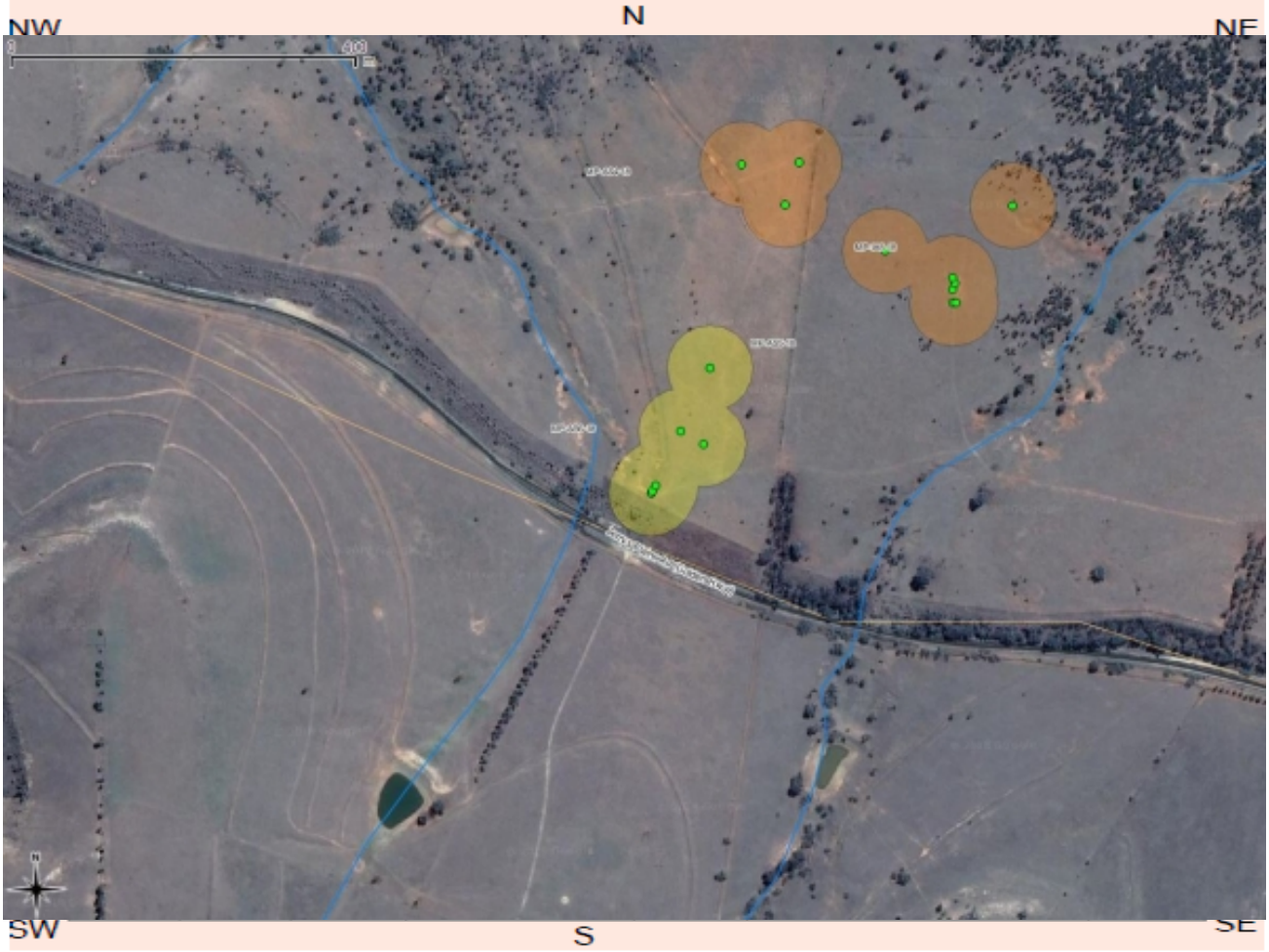
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 70 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 10 m north of the Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Poor

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	6	160	30				

Description:

Open artefact scatter comprising six artefacts 2 x silcrete complete flakes, 1 x tuff complete flake, 1 tuff multidirectional core, 1 x silcrete flake shatter, and 1 x tuff flake shatter.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

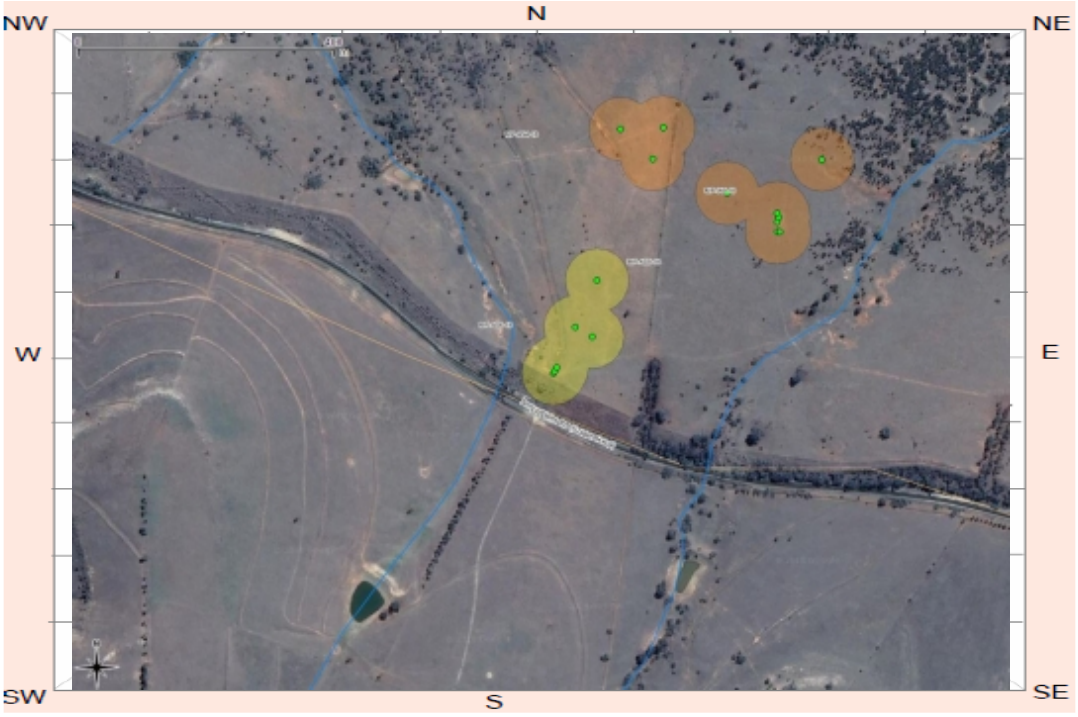
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Site Plan



Description: Artefact



Description: Core

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5844 **Date recorded:** 19-11-2018

Site Location Information

Site name: MP-AS25-18

Easting: 299273 **Northing:** 6412434 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 3

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

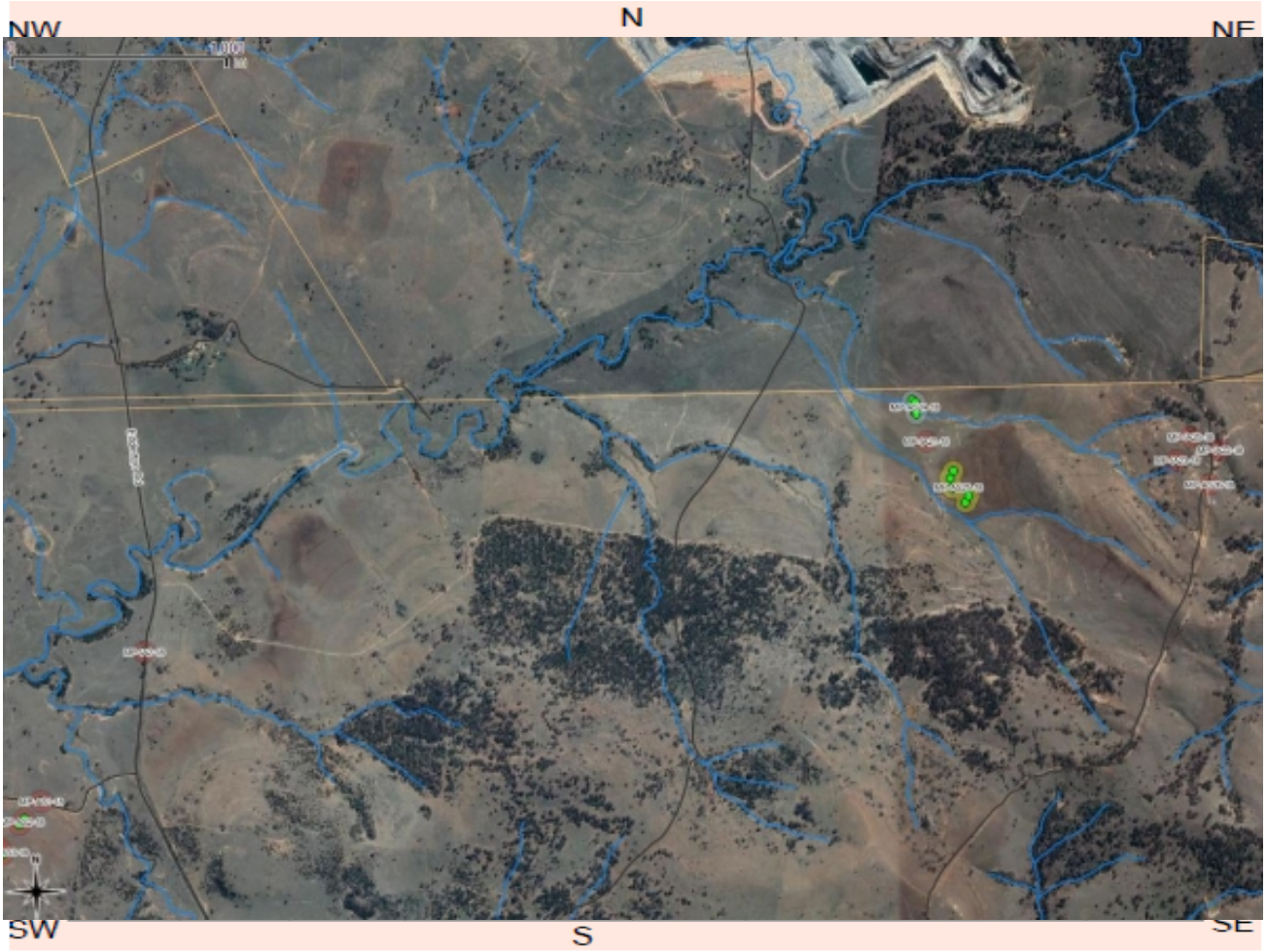
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 100 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 3.7 km east of the Edderton Road in a cleared paddock.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	6	155	80				

Description:

Open artefact scatter comprising six artefacts 2 x tuff complete flakes, 1 x chert complete flake, 1 x silcrete complete flakes, 1 x silcrete flake shatter, and 1 x tuff flake shatter.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

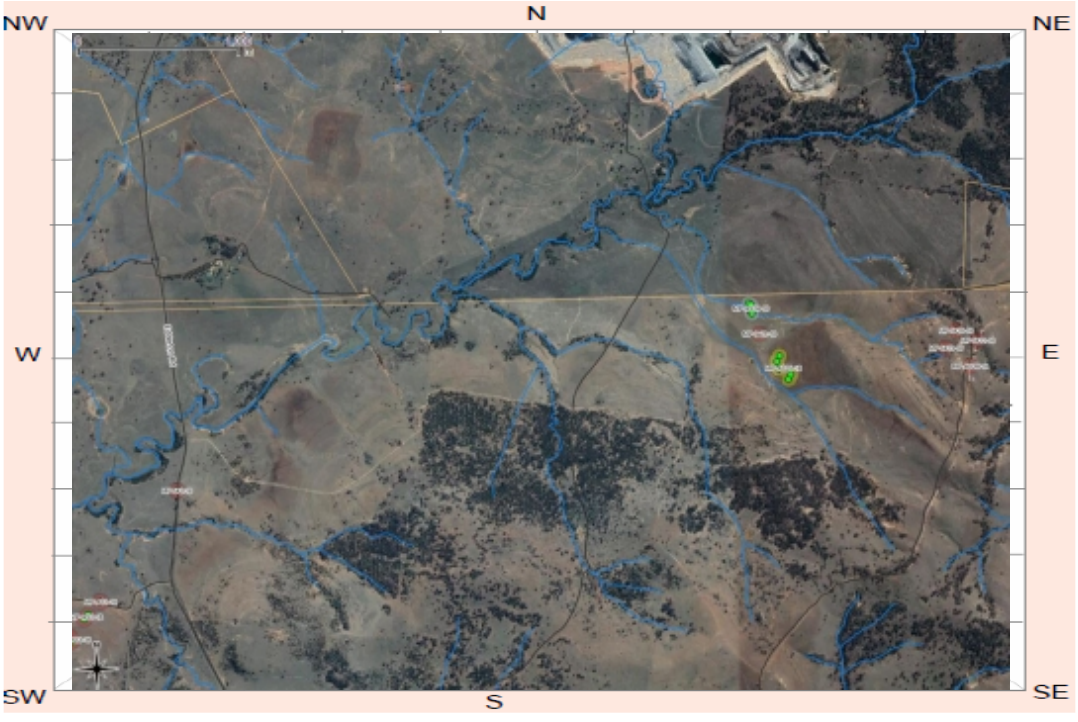
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Site location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5845 **Date recorded:** 19-11-2018

Site Location Information

Site name: MP-AS26-18

Easting: 300439 **Northing:** 6412447 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 3

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

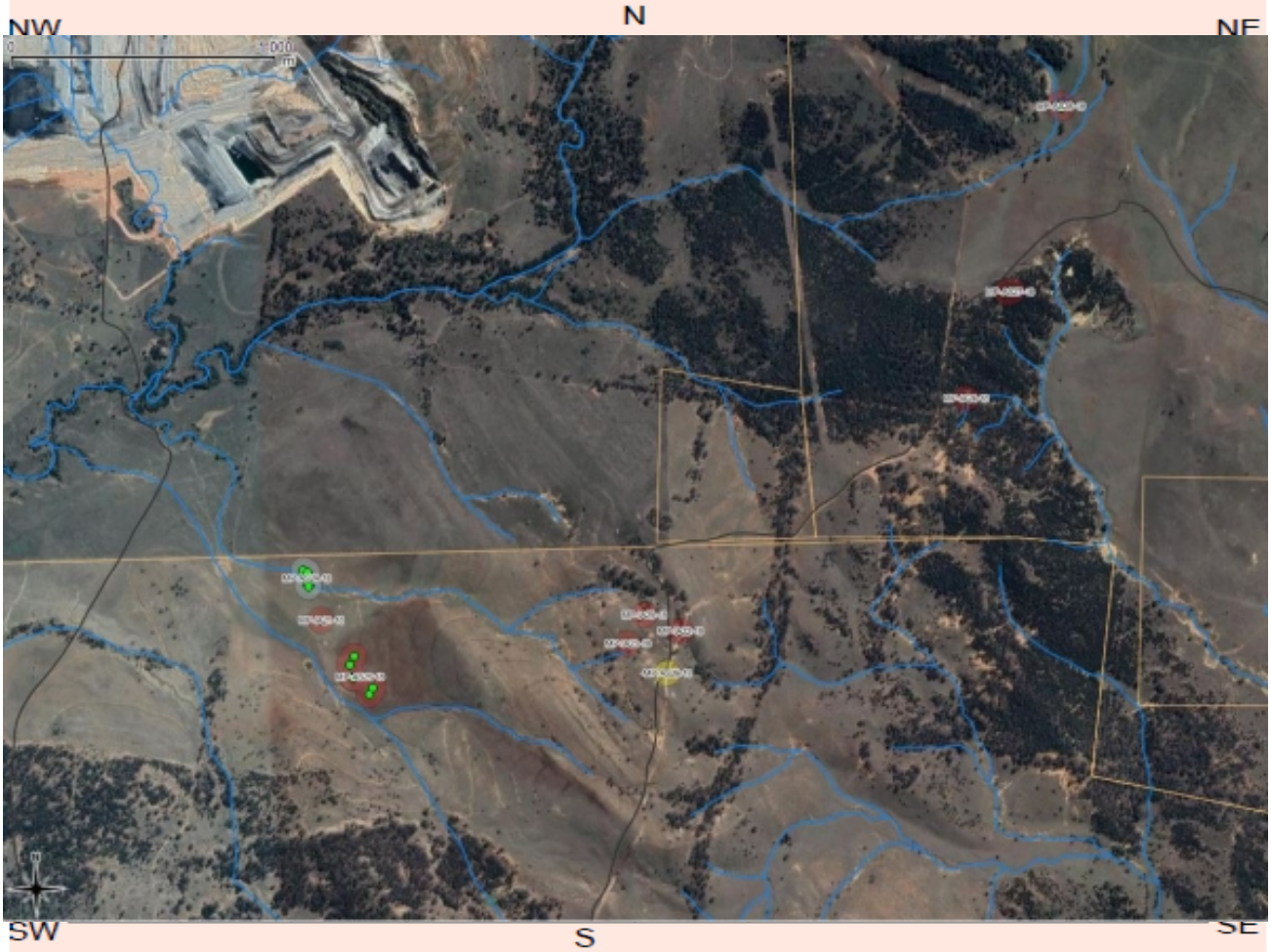
Land Form Unit: Crest **Vegetation:** Cleared

Distance to Water (m): 360 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 5 km east of the Edderton Road.

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	2	3	1				

Description:

Open artefact scatter comprising two artefacts 1 x tuff complete flakes and 1 x tuff angular shatter fragment.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

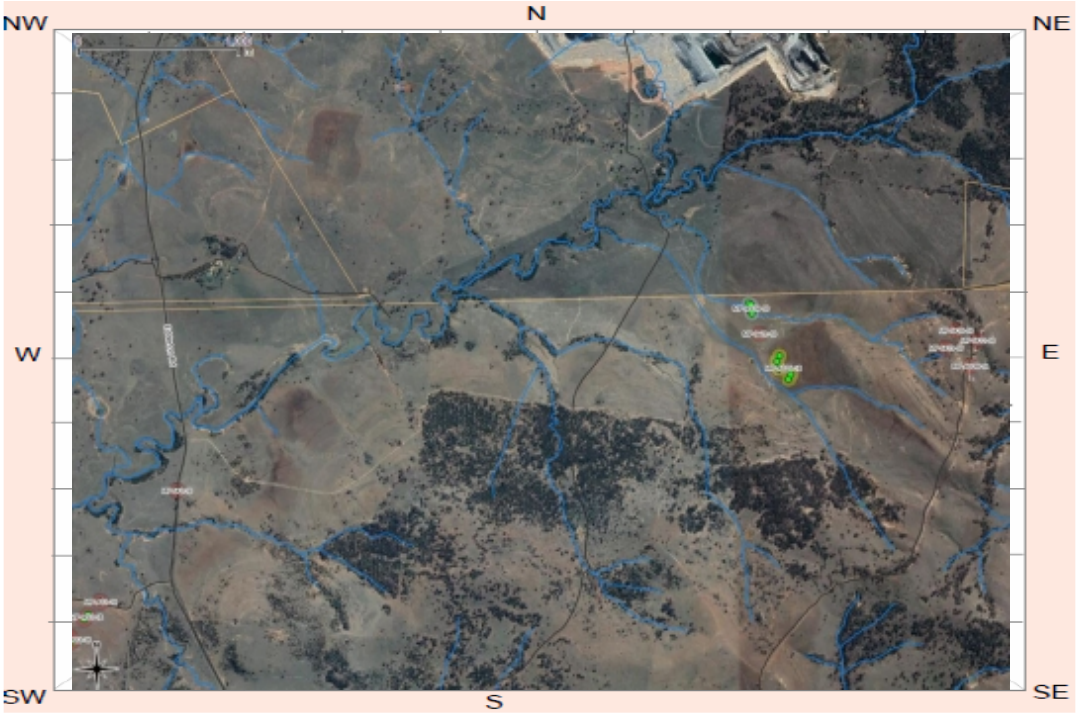
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Site location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5846 **Date recorded:** 19-11-2018

Site Location Information

Site name: MP-AS27-18

Easting: 301739 **Northing:** 6413894 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 3

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

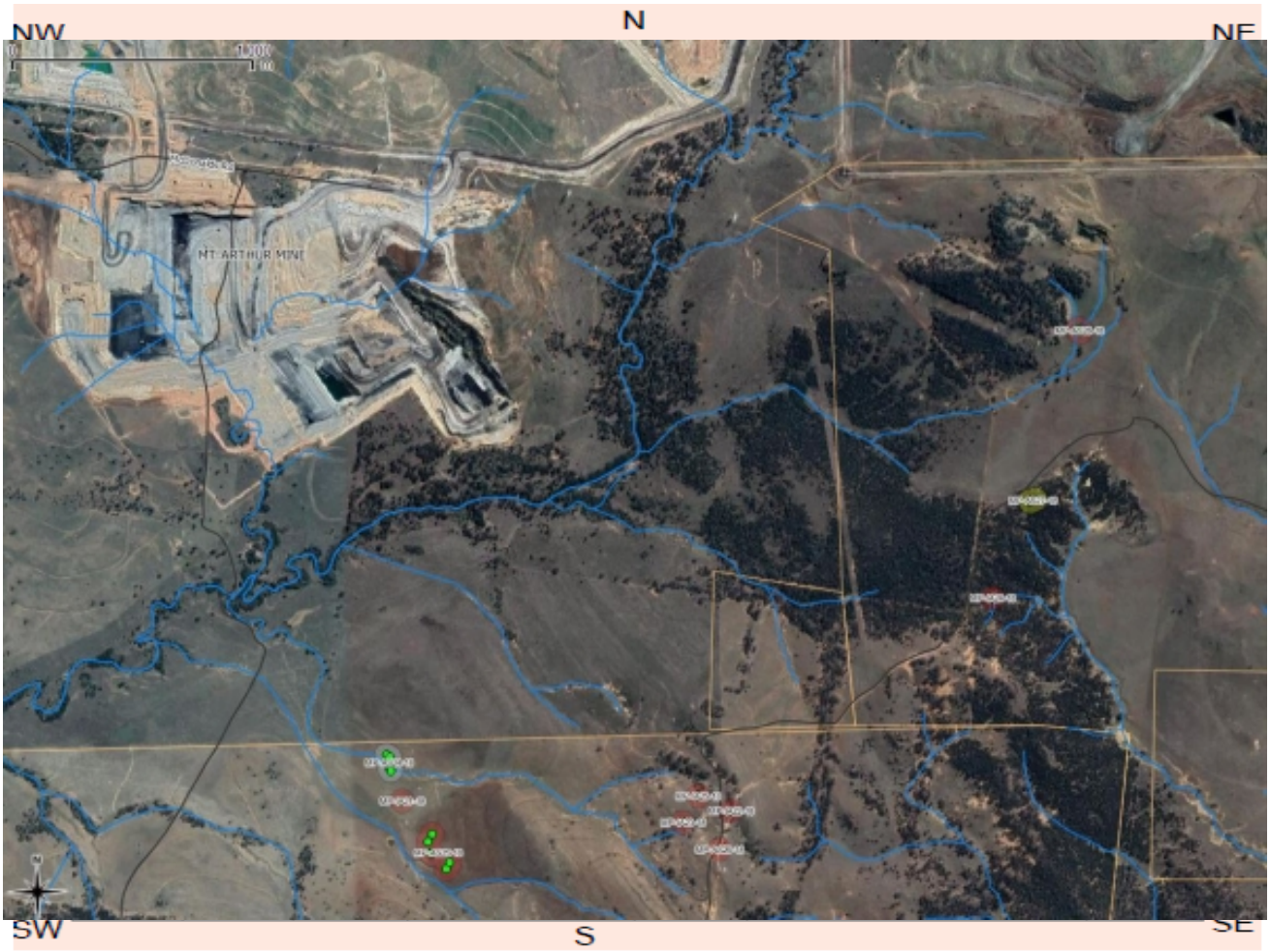
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 160 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 1.4 km south of Drayton Mine (Maxwell).

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Poor

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	3	25	5				

Description:

Open artefact scatter comprising 3 artefacts 1 x silcrete complete flake, 1 x quartz complete flake, and 1 x FGS complete flake.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

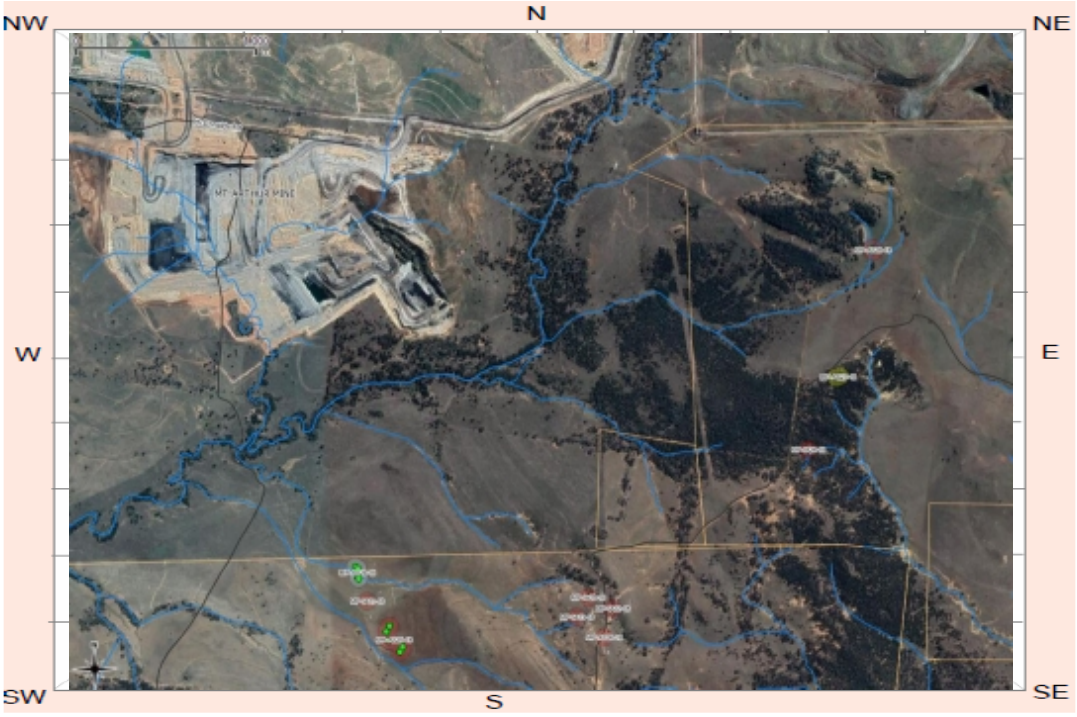
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Site location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5847 **Date recorded:** 19-11-2018

Site Location Information

Site name: MP-AS28-18

Easting: 301931 **Northing:** 6414599 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 3

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 20 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 70m south of Drayton Mine (Maxwell).

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Poor

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	12	20	7				

Description:

Open artefact scatter comprising 12 artefacts 4 x porcellanite proximal flakes, 1 x porcellanite core, 1 x porcellantie complete flake, 3 x porcellanite flake shatter, 2 x silcrete complete flakes, and 1 x tuff flake shatter.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Site location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5848 **Date recorded:** 19-11-2018

Site Location Information

Site name: MP-IA2-18

Easting: 295488 **Northing:** 6411668 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 3

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

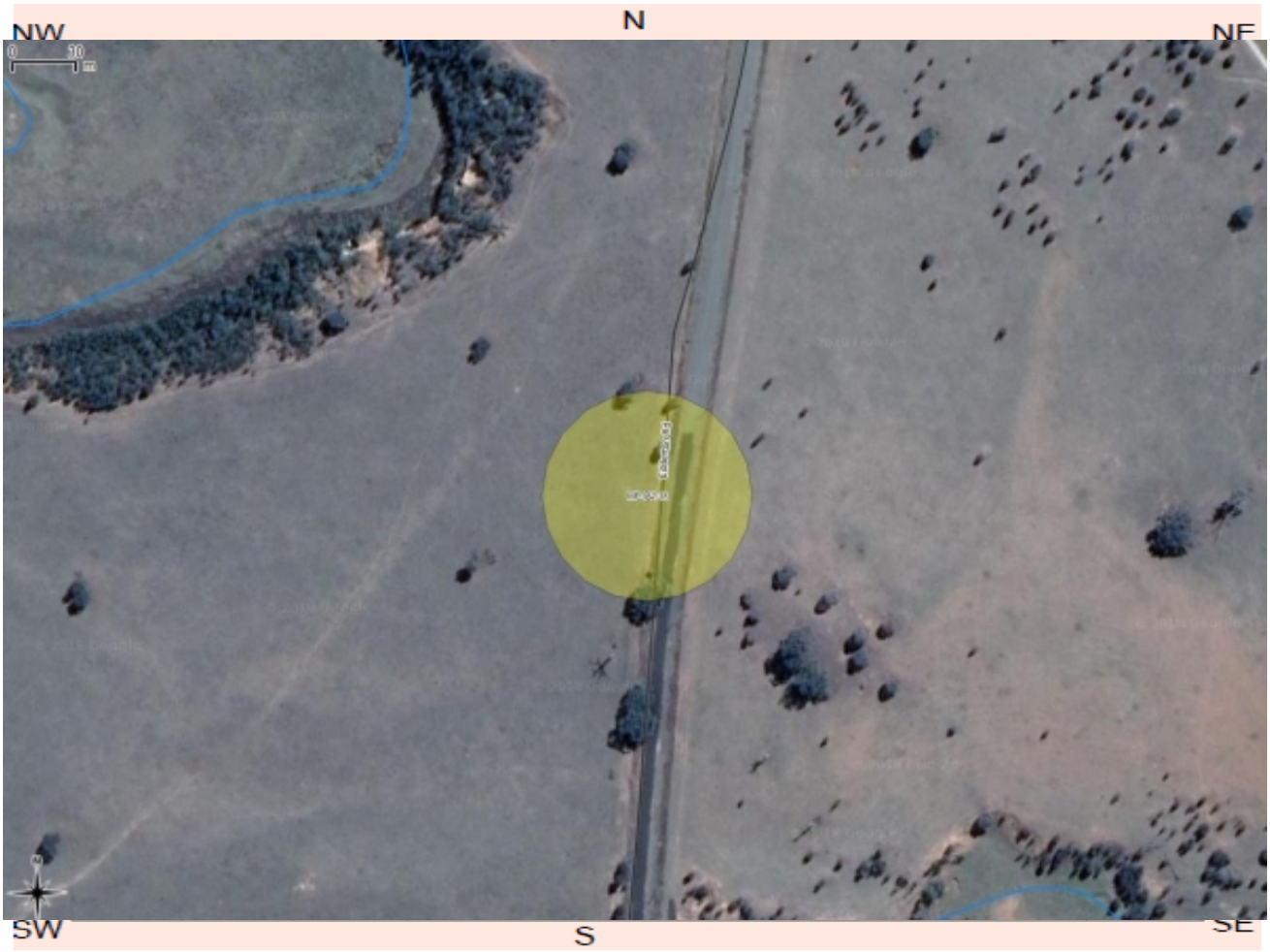
Land Form Unit: Flat **Vegetation:** Cleared

Distance to Water (m): 185 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 10m west of Edderton Road.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	1	1				

Description:

Open artefact scatter comprising 1 x tuff complete flake.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.								

Description:

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.								

Description:

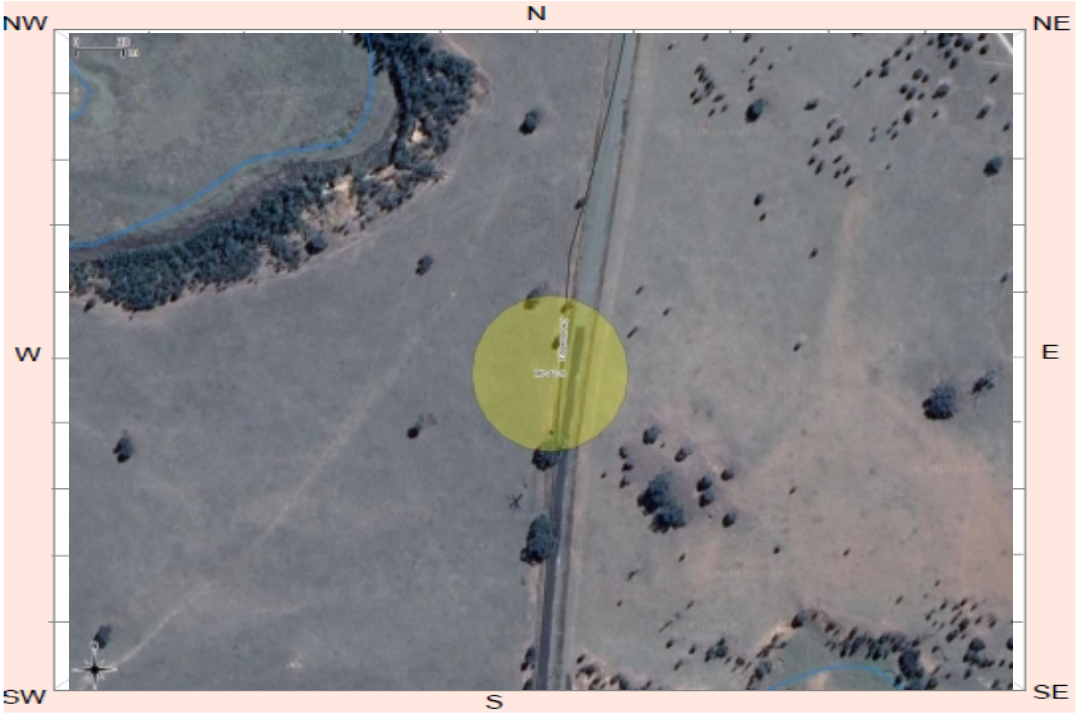
Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.								

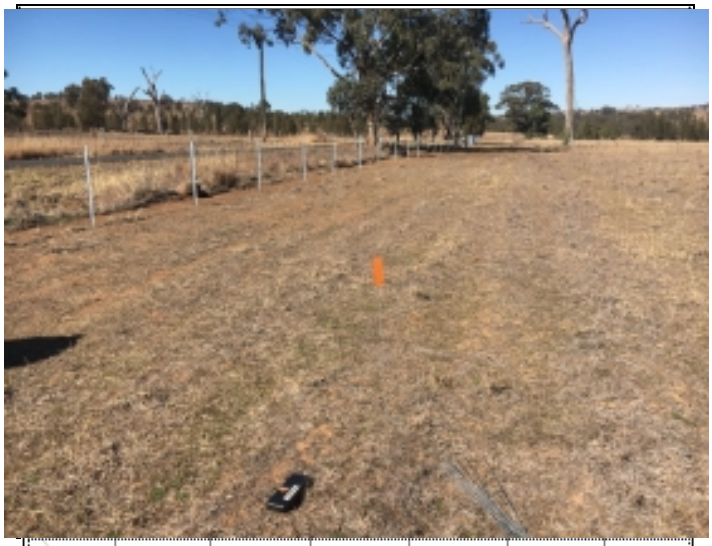
Description:

Other Site Info:

Site plan



Site photographs



Description: Site location

Description:

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 37-2-5849 **Date recorded:** 19-11-2018

Site Location Information

Site name: MP-IA3-18

Easting: 294649 **Northing:** 6409946 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 3

Zone: 56 **Location method:** Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mr.	Oakes	Geordie

Organisation: AECOM

Address: 420 George St, Sydney, 200

Phone: 0410513509 **E-mail:** geordie.oakes@aecom.com

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Pastoral/Grazing

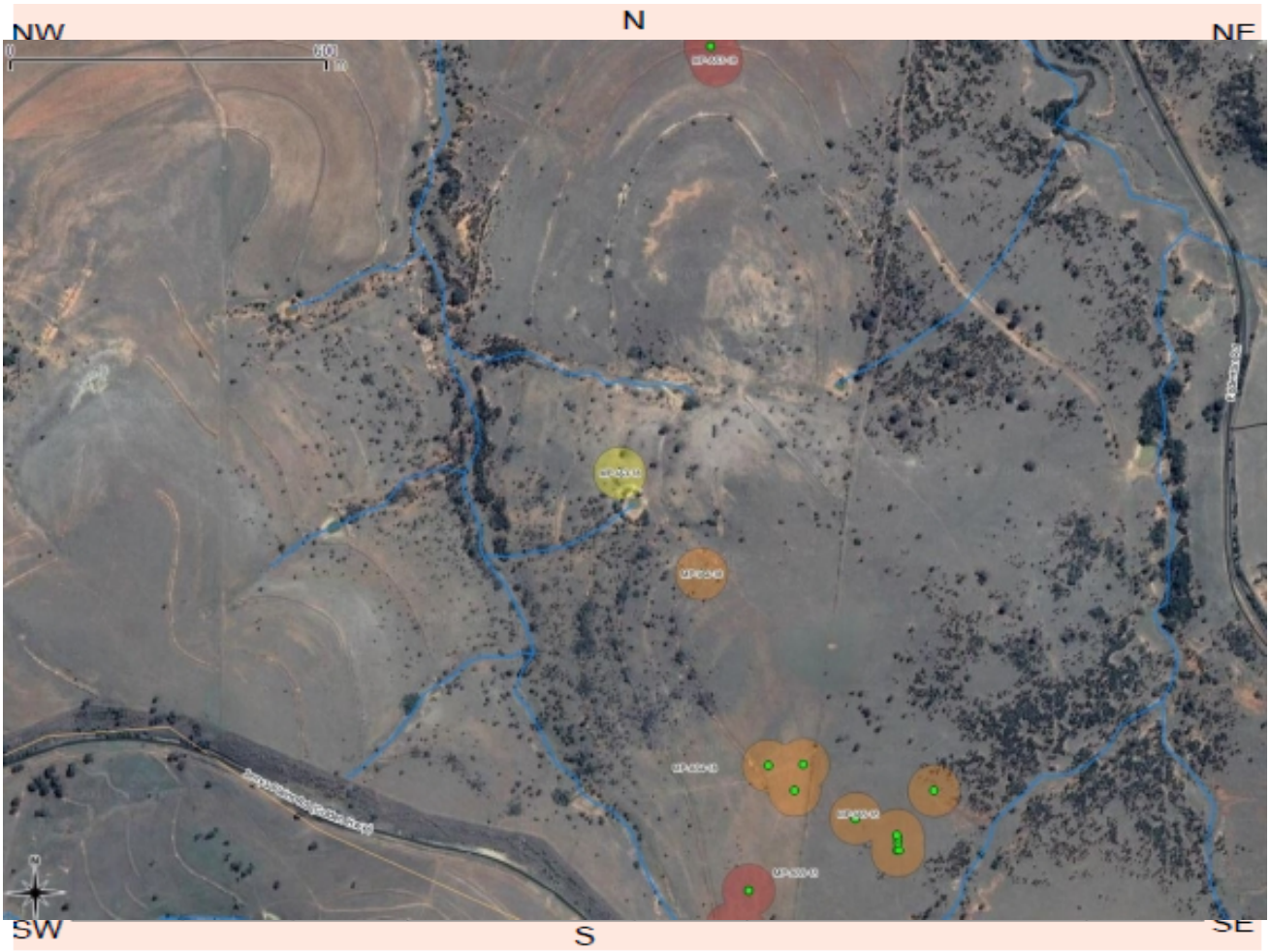
Land Form Unit: Slope **Vegetation:** Cleared

Distance to Water (m): 300 **Primary Report:** AECOM (2018) Maxwell Project ACHAR

How to get to the site: Site is located 800 m north of Golden Highway.

Other site information:

Site location map



Site contents information

open/closed site: Open **Site condition:** Poor

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	1	1				

Description:

Isolated artefact comprising 1 x tuff flake shatter.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

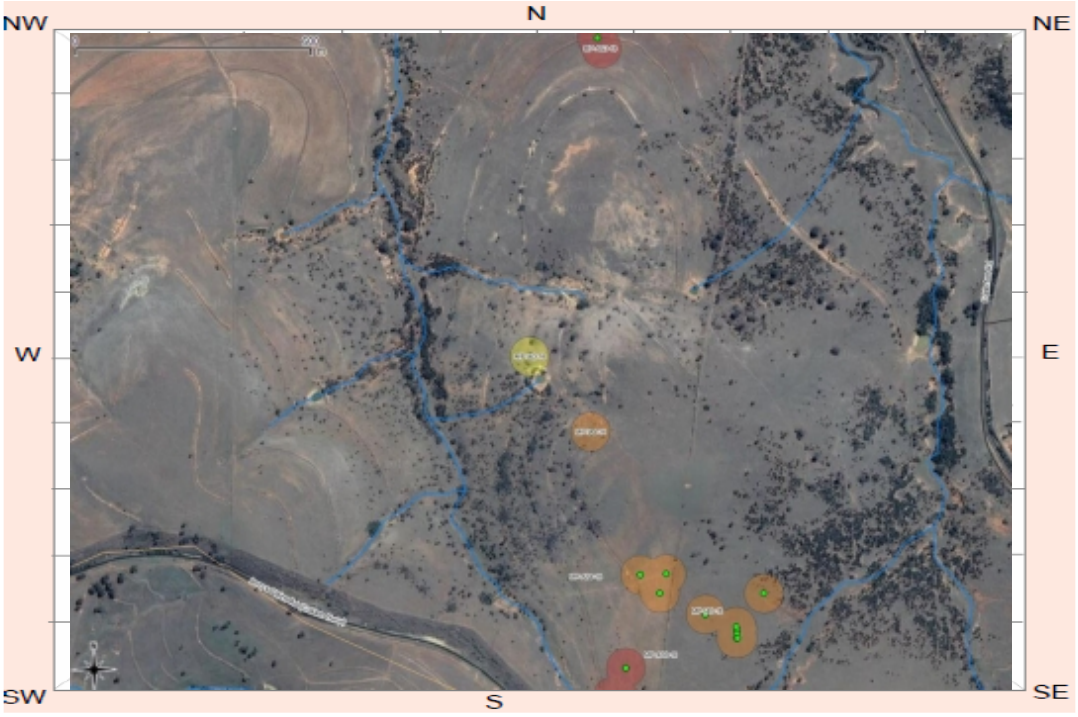
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs



Description: Site location



Description: Artefact

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Appendix M

Subsidence Assessment Extracts

The building structures, surface infrastructure and improvements on the properties located outside the Study Area are predicted to experience negligible vertical subsidence, tilts, curvatures and strains. It is unlikely that these features would experience adverse impacts due to the proposed mining. All structures, infrastructure and improvements on the private properties are expected to remain in safe and serviceable conditions throughout the mining period.

6.15. Aboriginal heritage sites

6.15.1. Descriptions of the Aboriginal heritage sites

The locations of known Aboriginal heritage sites are shown in Drawing No. MSEC986-25. The details of these sites have been provided by *AECOM* (2019).

The Aboriginal heritage sites located within the Study Area and surrounds comprise stone quarries and other open artefact sites, i.e. isolated artefacts, artefact scatters and an artefact scatter with an associated potential archaeological deposit (PAD). The locations of these sites relative to the proposed mining areas are provided in Table D.01, in Appendix D. The locations provided in Table D.01 are based on an amalgamation of the sites and estimated extents due to the proximity of neighbouring sites.

Further details on the Aboriginal heritage sites are provided by *AECOM* (2019).

6.15.2. Predictions for the Aboriginal heritage sites

The maximum predicted total conventional subsidence parameters for each of the Aboriginal heritage sites are provided in Table D.01, in Appendix D. The predictions provided in Table D.01 are based on the maximum values within the amalgamation of the sites and estimated extents.

Summaries of the maximum predicted total vertical subsidence, tilt and curvatures for the stone quarries and the other open artefact sites (i.e. isolated artefacts, isolated artefacts, artefact scatters and artefact scatter with PAD) are provided in Table 6.12 and Table 6.13, respectively.

Table 6.12 Maximum predicted total vertical subsidence, tilt and curvatures for the stone quarries

After completion of seam	Maximum predicted total vertical subsidence (mm)	Maximum predicted total tilt (mm/m)	Maximum predicted total hogging curvature (km^{-1})	Maximum predicted total sagging curvature (km^{-1})
Whynot	< 20	< 0.5	< 0.01	< 0.01
Woodlands Hill	< 20	< 0.5	< 0.01	< 0.01
Arrowfield	< 20	< 0.5	< 0.01	< 0.01
Bowfield	< 20	< 0.5	< 0.01	< 0.01

Table 6.13 Maximum predicted total vertical subsidence, tilt and curvatures for the other open artefact sites

After completion of seam	Maximum predicted total vertical subsidence (mm)	Maximum predicted total tilt (mm/m)	Maximum predicted total hogging curvature (km^{-1})	Maximum predicted total sagging curvature (km^{-1})
Whynot	325	15	0.5	1.0
Woodlands Hill	3100	45	2.0	1.5
Arrowfield	4800	50	2.0	2.0
Bowfield	5450	50	2.0	2.0

The previously reported stone quarries within the Study Area and surrounds are predicted to experience less than 20 mm vertical subsidence. Whilst the stone quarries located outside the proposed mining area could experience very low-levels of vertical subsidence, they are not expected to experience measurable tilts, curvatures or strains.

The maximum predicted total conventional curvatures for the other open artefact sites are 2.0 km^{-1} hogging and sagging, which represent a minimum radius of curvature of 0.5 km. The predicted conventional strains based on applying a factor of 10 to the predicted conventional curvatures are 20 mm/m tensile and compressive.

The distributions of strain above the proposed mining area are provided in Section 4.3. The predicted strains due to the proposed multi-seam mining are 8 mm/m tensile and 9 mm/m compressive based on the 95 % confidence levels.

Non-conventional movements can also occur and have occurred in the NSW coalfields as a result of, amongst other things, anomalous movements. The analysis of strains provided in Chapter 4 includes those resulting from both conventional and non-conventional anomalous movements.

6.15.3. Impact assessments for the Aboriginal heritage sites

The Aboriginal heritage sites are located across the proposed mining area and, therefore, they could experience the range of the predicted mine subsidence movements. These sites can potentially be affected by cracking and heaving of the surface soils due to the proposed mining.

The assessed surface deformations above the proposed panels and longwalls are provided in Section 4.6.

The surface cracking in the flatter areas and at higher depths of cover is expected to be typically between 25 mm and 50 mm in approximately 50 % of cases, between 50 mm and 100 mm in approximately 30 % of cases, between 100 mm and 150 mm in approximately 15 % of cases and greater than 150 mm in approximately 5 % of cases.

The surface cracking in the steeper areas and at shallower depths of cover is expected to be typically between 50 mm and 100 mm in approximately 60 % of cases, between 100 mm and 200 mm in approximately 25 % of cases, between 200 mm and 300 mm in approximately 10 % of cases and greater than 300 mm in approximately 5 % of cases. Multiple cracks resulting in deformations over several metres can also occur in some locations (i.e. less than 1 % of cases).

It is unlikely that the finds, artefacts and deposits themselves would be impacted by surface cracking. It is possible, however, that if remediation of the surface was required after mining, that these works could potentially impact the Aboriginal heritage sites.

It is recommended that Malabar develop appropriate protocols in the event that remediation of the surface is required in the locations of the isolated finds, artefact scatters and deposits. Further assessments of the potential impacts on these sites are provided by *AECOM* (2019).

6.15.4. Recommendations for the Aboriginal heritage sites

Recommendations for Aboriginal heritage sites have been provided by the specialist Aboriginal cultural heritage consultant for the EIS in the report by *AECOM* (2019). It is recommended that the Aboriginal Cultural Heritage Management Plan (ACHMP) include visual inspection of sites prior to mining within 500 m of the site and following the completion of active subsidence at the site. Protocols should be developed to manage sites that may be directly impacted by surface cracking or that may be disturbed during surface remediation activities.

6.16. Historic heritage sites

The locations of the historic heritage sites are shown in Drawing No. MSEC986-25. The details of these sites have been provided by *Extent Heritage* (2019).

Historic heritage sites identified by *Extent Heritage (2019)* are located outside the Study Area. The sites in the region include the Arrowfield Homestead, Bowfield Homestead, Edderton Homestead, Plashett Homestead, Randwick Homestead, Strowan Homestead, Woodlands Homestead and a stockyard.

The historic heritage sites are located at distances between 0.7 km and 5 km outside the proposed mining area. At these distances, these sites are predicted to experience negligible ground movements due to the proposed mining. The potential for mining-induced impacts on these historic heritage sites is considered to be negligible.

Further assessments of the historic heritage sites are provided by *Extent Heritage* (2019).

6.17. Survey control marks

The survey control marks are shown in Drawing No. MSEC986-24. The locations and details of the survey control marks were obtained from *Spatial Services* using the *SCIMS Online* website (SCIMS, 2018).

The survey control marks are located across the Study Area and, therefore, are expected to experience the range of predicted subsidence movements. A summary of the maximum predicted conventional subsidence movements within the Study Area is provided in Chapter 4.

Table D.01 - Details and maximum predicted subsidence effects for the Aboriginal heritage sites within the Study Area

AHIMS	Site type	Located above WN Seam mining area	Located above WH Seam mining area	Located above AF Seam mining area	Located above BF Seam mining area	Located outside of the mining areas	Maximum predicted total vertical subsidence after WN Seam (mm)	Maximum predicted total vertical subsidence after WH Seam (mm)	Maximum predicted total vertical subsidence after AF Seam (mm)	Maximum predicted total vertical subsidence after BF Seam (mm)	Maximum predicted total tilt after BF Seam (mm/m)	Maximum predicted total hogging curvature after BF Seam (1/km)	Maximum predicted total sagging curvature after BF Seam (1/km)
37-2-0004	Artefact Scatter		1	1	1		< 20	2350	4300	5000	50	2.00	1.70
37-2-0006	Artefact Scatter		1	1	1		< 20	2350	4300	5000	50	2.00	1.70
37-2-0053	Artefact Scatter		1	1	1		< 20	2350	4300	5000	50	2.00	1.70
37-2-0069	Artefact Scatter		1	1			< 20	40	525	550	20	0.80	0.40
37-2-0073	Artefact Scatter		1	1	1		< 20	2550	4550	5250	30	1.60	1.30
37-2-0074	Artefact Scatter		1	1	1		< 20	2350	3800	4800	20	0.50	0.35
37-2-0075	Artefact Scatter		1	1	1		< 20	2050	3800	4500	16	0.80	0.60
37-2-0076	Artefact Scatter		1	1	1		< 20	2350	4300	5000	50	2.00	1.70
37-2-0077	Artefact Scatter		1				< 20	225	225	225	7	0.35	0.03
37-2-0078	Artefact Scatter	1	1				175	2900	2900	2900	20	0.50	1.20
37-2-0080	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-0082	Artefact Scatter	1	1				125	2050	2050	2050	20	0.45	0.20
37-2-0089	Artefact Scatter	1					100	125	125	125	2.5	0.15	0.16
37-2-0090	Artefact Scatter	1					100	125	125	125	2.5	0.15	0.16
37-2-0289	Artefact Scatter		1	1	1		< 20	2350	4300	5000	50	2.00	1.70
37-2-0362	Artefact Scatter		1	1	1		< 20	2350	4300	5000	50	2.00	1.70
37-2-0363	Artefact Scatter		1	1	1		< 20	2350	4300	5000	50	2.00	1.70
37-2-0364	Artefact Scatter		1	1	1		< 20	2350	4300	5000	50	2.00	1.70
37-2-0365	Artefact Scatter		1	1	1		< 20	2350	4300	5000	50	2.00	1.70
37-2-0366	Artefact Scatter		1	1	1		< 20	2350	4300	5000	50	2.00	1.70
37-2-0367	Artefact Scatter		1	1	1		< 20	2300	4250	5100	25	1.10	0.70
37-2-0368	Artefact Scatter		1	1	1		< 20	2300	4250	5100	25	1.10	0.70
37-2-0369	Artefact Scatter		1	1	1		< 20	2050	3800	4500	16	0.80	0.60
37-2-0370	Artefact Scatter		1	1	1		< 20	2050	3800	4500	16	0.80	0.60
37-2-0371	Artefact Scatter		1	1	1		< 20	2050	3700	4400	25	0.45	0.35
37-2-0372	Artefact Scatter		1	1	1		< 20	2050	3700	4400	25	0.45	0.35
37-2-0373	Artefact Scatter		1	1	1		< 20	2050	3700	4400	25	0.45	0.35
37-2-0374	Artefact Scatter			1	1		< 20	70	375	500	13	0.30	< 0.01
37-2-0375	Artefact Scatter		1	1	1		< 20	1950	3600	4200	40	0.30	1.00
37-2-0376	Artefact Scatter		1	1	1		< 20	2050	3800	4500	16	0.80	0.60
37-2-0377	Artefact Scatter		1	1	1		< 20	2050	3650	4500	18	0.20	0.45
37-2-0378	Artefact Scatter		1	1	1		< 20	2050	3800	4500	16	0.80	0.60
37-2-0379	Artefact Scatter		1	1	1		< 20	2050	3800	4500	16	0.80	0.60
37-2-0380	Artefact Scatter		1	1	1		< 20	2300	4250	5100	25	1.10	0.70
37-2-0381	Artefact Scatter		1	1	1		< 20	2300	4250	5100	25	1.10	0.70
37-2-0382	Artefact Scatter		1	1	1		< 20	2300	4250	5100	25	1.10	0.70
37-2-0383	Artefact Scatter		1	1	1		< 20	2350	4300	5000	50	2.00	1.70
37-2-0396	Artefact Scatter					1	< 20	40	525	550	20	0.80	0.40
37-2-0397	Artefact Scatter		1	1	1		< 20	2550	4550	5250	30	1.60	1.30
37-2-0398	Artefact Scatter		1	1	1		< 20	2350	4200	4900	9	< 0.01	0.50
37-2-0399	Artefact Scatter	1	1	1	1		175	2650	4800	5450	30	0.60	0.90
37-2-0400	Artefact Scatter	1	1	1	1		175	2650	4800	5450	30	0.60	0.90
37-2-0401	Artefact Scatter	1	1	1	1		175	2650	4800	5450	30	0.60	0.90

Table D.01 - Details and maximum predicted subsidence effects for the Aboriginal heritage sites within the Study Area

AHIMS	Site type	Located above WN Seam mining area	Located above WH Seam mining area	Located above AF Seam mining area	Located above BF Seam mining area	Located outside of the mining areas	Maximum predicted total vertical subsidence after WN Seam (mm)	Maximum predicted total vertical subsidence after WH Seam (mm)	Maximum predicted total vertical subsidence after AF Seam (mm)	Maximum predicted total vertical subsidence after BF Seam (mm)	Maximum predicted total tilt after BF Seam (mm/m)	Maximum predicted total hogging curvature after BF Seam (1/km)	Maximum predicted total sagging curvature after BF Seam (1/km)
37-2-0402	Artefact Scatter	1	1	1	1		175	2650	4800	5450	30	0.60	0.90
37-2-0403	Artefact Scatter	1	1	1	1		175	2650	4800	5450	30	0.60	0.90
37-2-0404	Artefact Scatter	1	1	1	1		175	2650	4800	5450	30	0.60	0.90
37-2-0405	Artefact Scatter	1	1	1	1		175	2650	4800	5450	30	0.60	0.90
37-2-0406	Artefact Scatter	1	1	1	1		175	2650	4800	5450	30	0.60	0.90
37-2-0407	Artefact Scatter	1	1	1	1		175	2650	4800	5450	30	0.60	0.90
37-2-0408	Artefact Scatter		1	1	1		< 20	2300	4100	5000	17	0.25	0.45
37-2-0409	Artefact Scatter	1	1				175	2900	2900	2900	20	0.50	1.20
37-2-0410	Artefact Scatter		1				< 20	2750	2750	2750	40	1.10	0.50
37-2-0411	Artefact Scatter		1				< 20	175	175	175	7.5	0.40	0.12
37-2-0412	Artefact Scatter		1				< 20	175	175	175	7.5	0.40	0.12
37-2-0413	Artefact Scatter					1	< 20	1350	1350	1350	50	1.70	0.70
37-2-0414	Artefact Scatter		1				< 20	1350	1350	1350	50	1.70	0.70
37-2-0415	Artefact Scatter		1				< 20	1350	1350	1350	50	1.70	0.70
37-2-0416	Artefact Scatter	1	1				275	3100	3100	3100	30	2.00	1.70
37-2-0417	Artefact Scatter					1	< 20	175	175	175	7.5	0.40	0.12
37-2-0418	Artefact Scatter with PAD	1	1				125	3050	3050	3050	40	0.60	0.80
37-2-0419	Artefact Scatter with PAD	1	1				125	3050	3050	3050	40	0.60	0.80
37-2-0505	Artefact Scatter		1	1	1		< 20	2350	4300	5000	50	2.00	1.70
37-2-1923	Artefact Scatter		1	1	1		< 20	2150	3950	4800	15	0.20	0.45
37-2-1928	Artefact Scatter	1	1	1	1		175	2650	4800	5450	30	0.60	0.90
37-2-1929	Artefact Scatter		1	1	1		< 20	1400	2400	3900	13	0.20	< 0.01
37-2-1930	Artefact Scatter		1	1	1		< 20	2250	4200	5150	20	0.40	0.50
37-2-1931	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-1932	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-1933	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-1934	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-1935	Artefact Scatter		1				< 20	1350	1350	1350	50	1.70	0.70
37-2-1936	Artefact Scatter		1	1	1		< 20	2550	4550	5250	30	1.60	1.30
37-2-1937	Artefact Scatter		1				< 20	1350	1350	1350	50	1.70	0.70
37-2-1938	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-1939	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-1940	Artefact Scatter	1	1	1			125	3000	4650	4650	35	0.40	0.70
37-2-1941	Artefact Scatter		1	1	1		< 20	2250	4100	5100	14	0.25	0.45
37-2-1942	Artefact Scatter	1	1	1			80	1950	3400	3400	20	0.45	0.06
37-2-1943	Artefact Scatter	1	1	1	1		175	2650	4800	5450	30	0.60	0.90
37-2-1946	Artefact Scatter		1				< 20	1350	1350	1350	50	1.70	0.70
37-2-1947	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-1954	Stone Quarry					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-1955	Stone Quarry					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-1956	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-1957	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-1960	Artefact Scatter		1	1	1		< 20	2150	3950	4800	15	0.20	0.45

Table D.01 - Details and maximum predicted subsidence effects for the Aboriginal heritage sites within the Study Area

AHIMS	Site type	Located above WN Seam mining area	Located above WH Seam mining area	Located above AF Seam mining area	Located above BF Seam mining area	Located outside of the mining areas	Maximum predicted total vertical subsidence after WN Seam (mm)	Maximum predicted total vertical subsidence after WH Seam (mm)	Maximum predicted total vertical subsidence after AF Seam (mm)	Maximum predicted total vertical subsidence after BF Seam (mm)	Maximum predicted total tilt after BF Seam (mm/m)	Maximum predicted total hogging curvature after BF Seam (1/km)	Maximum predicted total sagging curvature after BF Seam (1/km)
37-2-1961	Artefact Scatter		1	1	1		< 20	750	2350	3550	4.5	0.15	< 0.01
37-2-1986	Artefact Scatter		1				< 20	2750	2750	2750	40	1.10	0.50
37-2-2035	Artefact Scatter		1	1	1		< 20	750	2350	3550	4.5	0.15	< 0.01
37-2-2329	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-2330	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4226	Artefact Scatter		1	1	1		< 20	175	525	625	19	0.45	0.04
37-2-4227	Artefact Scatter			1	1		< 20	30	300	800	20	0.50	0.02
37-2-4228	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	0.02	< 0.01
37-2-4234	Artefact Scatter		1	1	1		< 20	2150	3900	4500	20	< 0.01	0.60
37-2-4235	Artefact Scatter		1	1	1		< 20	925	2750	4100	25	1.20	0.05
37-2-4236	Artefact Scatter		1	1	1		< 20	2050	3900	4650	18	0.60	0.60
37-2-4237	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4239	Artefact Scatter		1	1	1		< 20	2400	4300	4950	20	0.60	0.35
37-2-4240	Artefact Scatter		1	1	1		< 20	2400	4250	4950	20	0.70	0.45
37-2-4241	Artefact Scatter		1		1		< 20	2500	2550	4100	15	0.12	1.10
37-2-4242	Artefact Scatter		1				< 20	125	125	150	7.5	0.25	< 0.01
37-2-4243	Artefact Scatter		1		1		< 20	2600	2650	3650	45	0.06	1.30
37-2-4245	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4246	Artefact Scatter		1	1	1		< 20	2600	4350	4500	50	1.60	2.00
37-2-4247	Artefact Scatter	1	1	1	1		250	2650	4650	4800	45	0.90	1.10
37-2-4248	Artefact Scatter	1	1	1	1		275	2600	4600	5250	40	0.70	1.10
37-2-4249	Artefact Scatter	1	1	1	1		30	1900	4300	4800	16	0.25	0.30
37-2-4250	Artefact Scatter	1	1	1	1		175	2600	4750	5050	25	0.60	1.50
37-2-4251	Artefact Scatter	1	1	1	1		175	2600	4750	5050	25	0.60	1.50
37-2-4252	Artefact Scatter		1	1	1		< 20	2250	3450	4700	20	0.60	0.60
37-2-4253	Artefact Scatter		1	1	1		< 20	1850	4050	4800	16	0.25	0.40
37-2-4254	Artefact Scatter		1	1	1		< 20	2250	4100	4900	20	0.40	0.45
37-2-4255	Artefact Scatter		1	1	1		< 20	2000	3600	4400	13	0.10	0.40
37-2-4256	Artefact Scatter		1	1	1		< 20	2250	4050	4900	17	0.30	0.50
37-2-4257	Artefact Scatter		1	1	1		< 20	1250	3300	4000	12	0.25	0.08
37-2-4258	Artefact Scatter		1	1	1		< 20	1100	1800	3400	25	0.30	0.15
37-2-4259	Artefact Scatter					1	< 20	< 20	90	90	2	0.09	< 0.01
37-2-4260	Artefact Scatter		1	1	1		< 20	2250	4100	5100	14	0.25	0.45
37-2-4262	Artefact Scatter					1	< 20	40	60	60	1	0.04	< 0.01
37-2-4264	Artefact Scatter	1	1				100	1350	1800	1800	25	0.30	0.13
37-2-4265	Artefact Scatter	1	1	1	1		125	2200	3400	4700	14	0.30	0.09
37-2-4266	Artefact Scatter		1	1	1		< 20	2250	4050	4950	16	0.25	0.45
37-2-4267	Artefact Scatter	1	1	1			70	2550	4500	4500	25	0.45	0.50
37-2-4268	Artefact Scatter	1	1	1			70	2550	4400	4400	25	0.25	0.50
37-2-4269	Artefact Scatter	1	1				90	2550	2650	2650	11	0.13	0.35
37-2-4270	Artefact Scatter	1	1	1			80	1450	3500	3500	25	0.35	0.13
37-2-4271	Artefact Scatter	1	1				90	1750	1750	1750	18	0.45	< 0.01
37-2-4272	Artefact Scatter	1	1				90	1900	1900	1900	20	0.45	< 0.01

Table D.01 - Details and maximum predicted subsidence effects for the Aboriginal heritage sites within the Study Area

AHIMS	Site type	Located above WN Seam mining area	Located above WH Seam mining area	Located above AF Seam mining area	Located above BF Seam mining area	Located outside of the mining areas	Maximum predicted total vertical subsidence after WN Seam (mm)	Maximum predicted total vertical subsidence after WH Seam (mm)	Maximum predicted total vertical subsidence after AF Seam (mm)	Maximum predicted total vertical subsidence after BF Seam (mm)	Maximum predicted total tilt after BF Seam (mm/m)	Maximum predicted total hogging curvature after BF Seam (1/km)	Maximum predicted total sagging curvature after BF Seam (1/km)
37-2-4274	Artefact Scatter	1	1	1			125	2000	2900	2900	25	0.60	0.20
37-2-4275	Artefact Scatter	1	1	1			125	2500	2750	2750	17	0.35	0.25
37-2-4276	Artefact Scatter	1	1				80	2450	2550	2550	15	0.35	0.40
37-2-4277	Artefact Scatter		1				< 20	650	650	650	16	0.35	< 0.01
37-2-4278	Artefact Scatter	1	1				200	2650	2650	2650	19	0.35	0.90
37-2-4279	Artefact Scatter	1	1				70	2000	2000	2000	15	0.30	0.11
37-2-4280	Artefact Scatter	1	1				250	2400	2400	2400	25	0.70	1.20
37-2-4281	Artefact Scatter		1				< 20	2700	2700	2700	35	0.60	0.70
37-2-4282	Artefact Scatter		1				< 20	2700	2700	2700	35	0.70	0.80
37-2-4283	Artefact Scatter		1				< 20	2750	2750	2750	50	1.40	1.70
37-2-4284	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4285	Artefact Scatter					1	< 20	50	50	50	3.5	0.14	< 0.01
37-2-4286	Artefact Scatter	1	1				< 20	2800	2800	2800	35	0.90	0.70
37-2-4287	Artefact Scatter	1	1				275	2850	2850	2850	30	1.20	1.20
37-2-4288	Artefact Scatter	1	1				325	2800	2800	2800	30	1.30	1.60
37-2-4290	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4291	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4292	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4293	Artefact Scatter		1				< 20	2900	2900	2900	40	0.90	0.80
37-2-4294	Artefact Scatter		1				< 20	3000	3000	3000	40	1.10	0.90
37-2-4296	Artefact Scatter		1				< 20	2900	2900	2900	35	0.60	0.70
37-2-4297	Artefact Scatter	1	1				125	2850	2850	2850	30	2.00	0.60
37-2-4298	Artefact Scatter		1				< 20	2950	2950	2950	40	0.45	1.30
37-2-4299	Artefact Scatter	1	1				175	3050	3050	3050	20	0.25	0.90
37-2-4300	Artefact Scatter		1				< 20	425	425	425	16	0.90	0.04
37-2-4301	Artefact Scatter	1	1				125	2000	2000	2000	20	0.45	0.35
37-2-4302	Artefact Scatter	1	1				200	2800	2800	2800	20	0.20	1.30
37-2-4303	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4307	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4310	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4311	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4312	Artefact Scatter	1	1				175	3100	3100	3100	25	0.12	1.20
37-2-4313	Artefact Scatter					1	< 20	90	90	90	2	0.06	< 0.01
37-2-4317	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4318	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4327	Isolated Find					1	< 20	< 20	60	60	2.5	0.08	0.03
37-2-4328	Isolated Find					1	< 20	< 20	< 20	< 20	0.5	0.03	< 0.01
37-2-4329	Isolated Find		1	1	1		< 20	2200	4250	4550	50	1.50	1.60
37-2-4330	Isolated Find		1	1	1		< 20	750	2400	2650	40	0.80	0.35
37-2-4331	Isolated Find			1			< 20	50	300	375	8.5	0.25	0.02
37-2-4332	Isolated Find					1	< 20	< 20	< 20	30	0.5	0.01	< 0.01
37-2-4333	Isolated Find		1	1	1		< 20	900	2050	4000	17	0.80	0.07
37-2-4334	Isolated Find		1	1	1		< 20	450	1550	1650	30	1.70	0.80

Table D.01 - Details and maximum predicted subsidence effects for the Aboriginal heritage sites within the Study Area

AHIMS	Site type	Located above WN Seam mining area	Located above WH Seam mining area	Located above AF Seam mining area	Located above BF Seam mining area	Located outside of the mining areas	Maximum predicted total vertical subsidence after WN Seam (mm)	Maximum predicted total vertical subsidence after WH Seam (mm)	Maximum predicted total vertical subsidence after AF Seam (mm)	Maximum predicted total vertical subsidence after BF Seam (mm)	Maximum predicted total tilt after BF Seam (mm/m)	Maximum predicted total hogging curvature after BF Seam (1/km)	Maximum predicted total sagging curvature after BF Seam (1/km)
37-2-4335	Isolated Find	1	1	1	1		150	2450	4600	5150	17	0.30	1.20
37-2-4336	Isolated Find	1	1	1	1		100	2000	4400	5350	17	0.20	0.25
37-2-4337	Isolated Find		1	1	1		< 20	2200	4300	4950	11	0.08	0.35
37-2-4338	Isolated Find		1	1	1		< 20	2100	3500	4500	19	0.35	0.35
37-2-4339	Isolated Find		1	1	1		< 20	1900	3550	4400	15	0.12	0.50
37-2-4340	Isolated Find		1	1	1		< 20	425	2050	2950	25	0.25	0.25
37-2-4341	Isolated Find		1	1	1		< 20	700	2400	3800	4.5	0.25	0.08
37-2-4342	Isolated Find		1	1	1		< 20	1150	2900	3950	9.5	0.25	< 0.01
37-2-4343	Isolated Find					1	< 20	30	80	80	1.5	0.02	< 0.01
37-2-4344	Isolated Find	1	1	1	1		40	1550	3800	4400	20	0.25	0.15
37-2-4345	Isolated Find	1	1	1	1		< 20	2150	3950	4750	14	0.14	0.40
37-2-4346	Isolated Find		1	1	1		< 20	2150	3500	4550	17	0.30	0.17
37-2-4347	Isolated Find	1	1	1			70	2500	4600	4600	20	< 0.01	0.50
37-2-4348	Isolated Find	1	1	1			70	2450	2950	2950	17	0.30	0.25
37-2-4349	Isolated Find	1	1	1			70	2450	4150	4150	25	0.30	0.50
37-2-4350	Isolated Find	1	1				100	2750	2750	2750	16	< 0.01	0.40
37-2-4351	Isolated Find	1	1				175	2900	2900	2900	15	0.45	1.00
37-2-4352	Isolated Find	1	1				125	2550	2550	2550	16	0.35	0.70
37-2-4353	Isolated Find	1	1				150	2100	2100	2100	20	0.35	0.50
37-2-4354	Isolated Find	1	1				125	2400	2400	2400	16	0.30	0.30
37-2-4355	Isolated Find		1				< 20	2750	2750	2750	30	0.40	0.60
37-2-4356	Isolated Find		1				< 20	2850	2850	2850	50	2.00	2.00
37-2-4357	Isolated Find	1	1				200	2350	2350	2350	25	0.60	0.80
37-2-4358	Isolated Find		1				< 20	1050	1050	1050	30	0.90	< 0.01
37-2-4359	Isolated Find					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4361	Isolated Find					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4362	Isolated Find					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4364	Isolated Find					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4367	Isolated Find					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4370	Isolated Find					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4371	Isolated Find	1	1				80	1850	1850	1850	20	0.40	0.08
37-2-4372	Isolated Find	1	1				80	2950	2950	2950	18	< 0.01	0.50
37-2-4373	Isolated Find	1	1	1			125	425	2150	2150	30	0.40	0.45
37-2-4376	Isolated Find					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4377	Isolated Find					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4378	Isolated Find					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4379	Isolated Find					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4426	Isolated Find					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4427	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-4428	Isolated Find		1		1		< 20	2550	2550	3650	30	0.07	1.00
37-2-4432	Artefact Scatter	1	1	1	1		175	2600	4750	5050	25	0.60	1.50
37-2-4512	Artefact Scatter					1	< 20	20	30	30	1	0.06	< 0.01
37-2-4536	Isolated Find					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01

Table D.01 - Details and maximum predicted subsidence effects for the Aboriginal heritage sites within the Study Area

AHIMS	Site type	Located above WN Seam mining area	Located above WH Seam mining area	Located above AF Seam mining area	Located above BF Seam mining area	Located outside of the mining areas	Maximum predicted total vertical subsidence after WN Seam (mm)	Maximum predicted total vertical subsidence after WH Seam (mm)	Maximum predicted total vertical subsidence after AF Seam (mm)	Maximum predicted total vertical subsidence after BF Seam (mm)	Maximum predicted total tilt after BF Seam (mm/m)	Maximum predicted total hogging curvature after BF Seam (1/km)	Maximum predicted total sagging curvature after BF Seam (1/km)
37-2-4537	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5002	Artefact Scatter		1	1			< 20	1550	2450	2450	35	0.35	< 0.01
37-2-5003	Artefact Scatter		1	1			< 20	2450	4100	4100	35	0.35	0.50
37-2-5004	Artefact Scatter		1	1			< 20	2200	4400	4400	20	0.20	0.40
37-2-5005	Artefact Scatter		1	1	1		< 20	1000	2550	3000	16	0.35	0.03
37-2-5006	Artefact Scatter		1	1	1		< 20	2400	4150	4550	20	0.11	0.60
37-2-5007	Artefact Scatter	1	1	1	1		175	2650	4800	5450	30	0.60	0.90
37-2-5008	Artefact Scatter		1	1	1		< 20	1950	3350	3650	30	0.25	0.45
37-2-5014	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5016	Isolated Find					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5022	Isolated Find					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5023	Isolated Find					1	< 20	< 20	30	30	0.5	0.05	< 0.01
37-2-5024	Isolated Find		1	1			< 20	2350	4550	4550	20	0.09	0.70
37-2-5035	Isolated Find		1	1			< 20	1650	4050	4050	20	0.25	0.25
37-2-5036	Isolated Find		1	1			< 20	900	3050	3050	20	0.35	< 0.01
37-2-5043	Artefact Scatter	1	1	1			70	2500	4650	4650	25	0.45	0.70
37-2-5469	Artefact Scatter		1	1	1		< 20	2050	3700	4400	25	0.45	0.35
37-2-5470	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5787	Isolated Artefact					1	< 20	30	125	175	2.5	0.03	< 0.01
37-2-5840	Artefact Scatter					1	< 20	< 20	60	60	1	0.04	< 0.01
37-2-5841	Artefact Scatter					1	< 20	< 20	50	50	1	0.02	< 0.01
37-2-5842	Artefact Scatter					1	< 20	< 20	90	90	2.5	0.10	< 0.01
37-2-5843	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5844	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5845	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5846	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5847	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5848	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5849	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5850	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5851	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5852	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5853	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5854	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5861	Isolated Artefact		1	1	1		< 20	70	1450	1650	25	0.50	0.25
37-2-5862	Artefact Scatter	1	1	1			80	2500	4550	4550	25	0.45	0.45
37-2-5863	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5864	Artefact Scatter	1	1	1			70	2500	4250	4250	20	0.35	0.45
37-2-5865	Artefact Scatter	1	1	1			70	2500	4350	4350	20	0.50	0.60
37-2-5866	Artefact Scatter	1	1	1			60	2300	4000	4000	19	0.45	0.45
37-2-5867	Artefact Scatter	1	1	1			80	2400	3950	3950	20	0.40	0.25
37-2-5868	Isolated Artefact	1	1	1			80	1300	3300	3300	20	0.40	< 0.01
37-2-5869	Artefact Scatter		1	1			< 20	850	3100	3150	20	0.35	< 0.01

Table D.01 - Details and maximum predicted subsidence effects for the Aboriginal heritage sites within the Study Area

AHIMS	Site type	Located above WN Seam mining area	Located above WH Seam mining area	Located above AF Seam mining area	Located above BF Seam mining area	Located outside of the mining areas	Maximum predicted total vertical subsidence after WN Seam (mm)	Maximum predicted total vertical subsidence after WH Seam (mm)	Maximum predicted total vertical subsidence after AF Seam (mm)	Maximum predicted total vertical subsidence after BF Seam (mm)	Maximum predicted total tilt after BF Seam (mm/m)	Maximum predicted total hogging curvature after BF Seam (1/km)	Maximum predicted total sagging curvature after BF Seam (1/km)
37-2-5870	Artefact Scatter	1	1	1			70	2500	4550	4550	20	0.25	0.40
37-2-5871	Artefact Scatter		1	1	1		< 20	2400	4250	5300	25	0.30	0.60
37-2-5872	Artefact Scatter		1	1			< 20	1600	3600	3600	35	0.50	0.50
37-2-5873	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5874	Artefact Scatter		1	1	1		< 20	2300	4250	4600	35	0.30	0.60
37-2-5875	Artefact Scatter		1	1	1		< 20	2350	4200	5300	18	0.25	0.45
37-2-5876	Artefact Scatter		1	1	1		< 20	2100	4000	4950	30	0.20	0.50
37-2-5877	Artefact Scatter		1	1	1		< 20	450	850	2350	18	0.17	0.08
37-2-5878	Artefact Scatter					1	< 20	< 20	30	40	1	0.01	< 0.01
37-2-5879	Artefact Scatter					1	< 20	20	70	125	2.5	0.04	< 0.01
37-2-5880	Artefact Scatter			1			< 20	90	325	425	6.5	0.14	0.01
37-2-5881	Artefact Scatter		1	1	1		< 20	2050	3800	4850	20	0.25	0.45
37-2-5882	Artefact Scatter			1			< 20	< 20	100	150	3	0.08	< 0.01
37-2-5883	Isolated Artefact					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5884	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5885	Artefact Scatter					1	< 20	< 20	< 20	20	1	0.03	< 0.01
37-2-5886	Isolated Artefact	1	1	1			60	1550	2700	2700	19	0.40	0.03
37-2-5887	Isolated Artefact	1	1	1			70	2500	4450	4450	17	< 0.01	0.40
37-2-5888	Isolated Artefact		1	1			< 20	2150	3950	3950	18	< 0.01	0.60
37-2-5889	Isolated Artefact		1	1			< 20	500	1350	1350	25	0.20	0.02
37-2-5890	Isolated Artefact		1	1			< 20	2350	4200	4550	30	0.35	0.60
37-2-5891	Isolated Artefact					1	< 20	< 20	100	100	2	0.03	< 0.01
37-2-5892	Isolated Artefact		1	1			< 20	1050	1800	1800	25	0.35	0.18
37-2-5893	Isolated Artefact		1	1	1		< 20	925	2350	4000	4.5	0.15	0.02
37-2-5894	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
37-2-5895	Isolated Artefact					1	< 20	< 20	40	50	1	0.01	< 0.01
37-2-5896	Isolated Artefact		1	1	1		< 20	1650	3300	3650	30	0.25	0.45
37-2-5897	Isolated Artefact		1	1	1		< 20	100	1150	1550	20	0.30	0.07
37-2-5898	Artefact Scatter					1	< 20	< 20	< 20	< 20	< 0.5	< 0.01	< 0.01
						Maximum	**325**	**3100**	**4800**	**5450**	**50**	**2.00**	**2.00**

Appendix N

Salvage Methodology

1.0 Introduction

This research design and archaeological salvage methodology has been prepared to guide the archaeological salvage program recommended for artefact scatter with PAD sites 37-2-0004/37-2-0505. These sites lie adjacent within 100m of each and essentially comprise a single archaeological site. Salvage excavation and surface collection has been recommended as an appropriate mitigation measure for proposed impacts to this site on the basis of its scientific significance.

2.0 Salvage Objectives & Rationale

The overarching objectives of the salvage program are as follows:

- To salvage a representative and statistically viable subsurface assemblage of stone artefacts from 37-2-0004/37-2-0505;
- To investigate whether any sources of silcrete/tuff are located within proximity to sites 37-2-0004/37-2-0505;
- To undertake post-excavation analyses that will produce and conserve knowledge of past Aboriginal occupation of the sites; and
- To investigate the broader archaeological and cultural context of the sites 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 sites 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 at the sites?
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 recovered from these sites and those from other local and sub-regional contexts?

4.0 Methodology

4.1 Open Area Excavation

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.

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.

The proposed excavation methodology is as follows:

- 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 alpha-numeric identifier;
- All excavation units will be excavated in 10 cm spits down to the base of the identified A_2 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;
- 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.

4.3 Geomorphological Assessment

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:

- 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.

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 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.

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.

6.0 Care & Control of Recovered Artefacts

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.