Gunlake Quarry Continuation Project (SSD-12469087)

Modification Report (MOD3) - Western Emplacement

Prepared for Gunlake Quarries Pty Ltd

November 2025

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Gunlake Quarries Pty Ltd

E230595 RP#15

November 2025

Version	Date	Prepared by	Reviewed by	Comments
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Approved by



Philip Towler
Associate Director
25 November 2025

Level 10 201 Pacific Highway
St Leonards NSW 2065
ABN: 28 141 736 558

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Executive Summary

ES1 The Gunlake Quarry Continuation Project

Gunlake Quarries Pty Ltd operates a hard rock quarry located at 715 Brayton Road, Marulan, NSW. The Quarry is approximately 7 kilometres north-west of Marulan in the Goulburn Mulwaree local government area. The land surrounding the Quarry is rural/agricultural land with a low population density.

The quarry was originally approved under the then Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) by the then Minister for Planning (MP 07_0074). This approval (07_0074) was surrendered in 2018. The Gunlake Quarry Extension Project (the 'Extension Project') was approved by State Significant Development (SSD) 7090, NSW Land and Environment Court (LEC) Approval 2017/108663 granted in 2017.

The then Department of Planning and Environment approved the Gunlake Quarry Continuation Project (SSD-12469087) (the 'Consent') to increase the production rate and final depth of the Quarry (the 'Continuation Project') in March 2023. The Consent has been modified twice: MOD1 included revisions to the biodiversity offset areas and the re-instatement of an area originally approved for disturbance under MP 07_0074 but not included in the Extension Project approval (approved July 2025) and MOD2 increased the approved heavy vehicle movements from 375 to 475 per day (approved August 2025).

ES2 Proposed modification

This proposed modification (MOD3) seeks to expand the Continuation Project disturbance area by 2.997 ha, on land wholly within the approved Site Boundary, to allow for expansion of the Western Emplacement (the modification area).

This modification is supported by:

- an Aboriginal cultural heritage assessment (Appendix A) that assesses impacts to archaeological values
- a streamlined Biodiversity Development Assessment Report (Appendix B) that assesses the impacts to flora and fauna.

ES3 Strategic context

The strategic context for the Gunlake Quarry Continuation Project is detailed in Chapter 2 of the *Gunlake Quarry Continuation Project (SSD-12469087) Environmental Impact Statement* (EMM 2021). There have been no changes to the strategic context of the Quarry that relate to the proposed modification.

ES4 Statutory context

The statutory context for the proposed modification remains largely unchanged from that detailed in Chapter 3 of the Continuation Project EIS (EMM 2021).

The statutory context matters specifically relating to the proposed modification are presented in this modification report.

The originally approved Continuation Project disturbance area was about 100 ha. MOD1 increased the approved footprint by 5.4 ha to a total of 105.4 ha. The proposed additional disturbance area is about 2.997 ha, representing a minimal environmental impact by increasing the total disturbance footprint by about 3%. Other than the use of the expanded emplacement area, no change to project activities is proposed. The development as modified would remain substantially the same as that originally approved (SSD-12469087).

A modification under section 4.55 (1A) of the EP&A Act is appropriate as the modification will involve minimal environmental impact.

ES5 Engagement

Gunlake's Engagement activities regarding MOD3 include:

- 20 October 2025 – Gunlake briefed DPHI
- 19 November 2025 – Community Consultative Committee – Gunlake briefed community members and Council representatives: Director of Assets and Operations, R. Hughes, and Councillor, B. Kirk
- 19 November 2025 – Gunlake briefed Goulburn Mulwaree Council Mayor, N. Dillon, and General Manager, S. Gallacher
- 21 November 2025 – Gunlake briefed Mrs Wendy Tuckerman MP, State Member for Goulburn.

Aboriginal consultation associated with the preparation of the ACHA is described in Section 6.1.

ES6 Impact assessment

The following impacts are predicted as a result of the proposed modification:

- Aboriginal heritage: The archaeological field survey and test excavations found no cultural heritage material present within the modification area. An unmodified Stringybark eucalypt was identified as having cultural values by one of the Aboriginal participants during the field survey. This tree was documented as a cultural site, GL-AT1, and is considered to be of low significance. The tree will be removed as part of the proposed modification as it is situated in the centre of the modification area. The timber will be relocated to within one of Gunlake's biodiversity areas. Identified impacts to GL-AT1 can be managed via the Aboriginal Cultural Heritage Management Plan, which will be updated following determination of MOD3, if approved.
- Biodiversity: Biodiversity impacts have largely been avoided through iterative design of the emplacement area, with reductions in footprint and avoidance of higher quality remnants of plant community type (PCT 3738) and areas of Box Gum Woodland critically endangered ecological community (CEEC). The residual impact is limited to the loss of 2.997 ha of highly modified PCT 3738 in DNG condition (with a low vegetation integrity score) and associated habitat for ecosystem credit species. There are no residual impacts to habitat for species credit species or serious and irreversible impact (SAII) entities. The proposed development will not require offsetting to compensate for residual impacts on PCT 3738.
- Air quality: The additional disturbance within the modification area would not materially change dust emissions from the Quarry compared to those assessed in the *Gunlake Quarry Continuation Project (SSD-12469087) Environmental Impact Statement* (EMM 2021) (Continuation Project EIS).
- Noise and vibration: The emplacement footprint would not reduce distance of Quarry activities to sensitive receivers. There would be negligible difference in the noise level associated with the extension of the Western Emplacement compared to those predicted in the Continuation Project EIS.
- Water: There will be no change to the extraction rate or water use and only small changes to the disturbance area and required water management. Therefore, no changes to water impacts as assessed in the Continuation Project EIS are predicted as a result of the proposed modification.
- Visual: No changes to the visual impacts assessed in the Continuation Project EIS are predicted as a result of the proposed modification.

- Historical heritage: There are no historical heritage items within the quarry site. Therefore, no changes to historical heritage impacts as assessed in the Continuation Project EIS is predicted as a result of the proposed modification.
- Traffic: The proposed modification will not change project traffic. Therefore, no changes to traffic impacts as assessed in the Continuation Project EIS are predicted as a result of the proposed modification.
- Waste: There will be no changes to waste management other than the use of the proposed expanded emplacement area for uneconomic material. Waste management will be improved due to the additional area to accommodate the emplacement material.
- Social: The proposed modification will not change the social impacts of quarry operations as assessed in the project EIS.

ES7 Justification

The volume of uneconomic material encountered during quarrying is greater than estimated at the time that the Continuation Project EIS (EMM 2021) was prepared. Therefore, additional emplacement area is required to accommodate the additional material. This modification is required because expanding the emplacement footprint will allow the continued efficient operation of the quarry.

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1 Introduction

1.1 Gunlake Quarry Continuation Project

Gunlake Quarries Pty Ltd (Gunlake) operates a hard rock Quarry (the 'Quarry') located at 715 Brayton Road, Marulan, NSW. The Quarry is approximately 7 kilometres (km) north-west of Marulan in the Goulburn Mulwaree local government area (Figure 1.1). Quarry operations commenced in 2009. The land surrounding the Quarry is rural/agricultural land with a low population density.

The Quarry was originally approved in 2008 under Part 3A of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). This approval (07_0074) was surrendered in 2018. The Gunlake Quarry Extension Project (the 'Extension Project') was approved by State Significant Development (SSD) 7090, NSW Land and Environment Court (LEC) Approval 2017/108663 granted in 2017.

On 2 March 2023, the then Department of Planning and Environment approved the Gunlake Quarry Continuation Project (SSD-12469087) (the 'Consent') to increase the production rate and final depth of the Quarry (the 'Continuation Project').

On 10 July 2025, Modification 1 (MOD1) to the Gunlake Quarry Continuation Project (SSD-12469087-Mod-1) was approved by the Department of Planning, Housing and Industry (DPHI). MOD1 included revisions to the biodiversity offset areas to improve overall biodiversity and conservation outcomes and the re-instatement of an area originally approved for disturbance under MP 07_0074 but not included in the Extension Project approval.

On 1 August 2025, Modification 2 (MOD2) to the Gunlake Quarry Continuation Project (SSD-12469087-Mod-2) was approved by DPHI. MOD2 increased the approved heavy vehicle movements from 375 to 475 per day.

1.2 The applicant

The Gunlake Group, consisting of Gunlake Concrete and Gunlake Quarries, is an Australian family-owned business that has rapidly expanded to meet customer and market demands, particularly across the Greater Sydney area, the Southern Highlands and Tablelands regions.

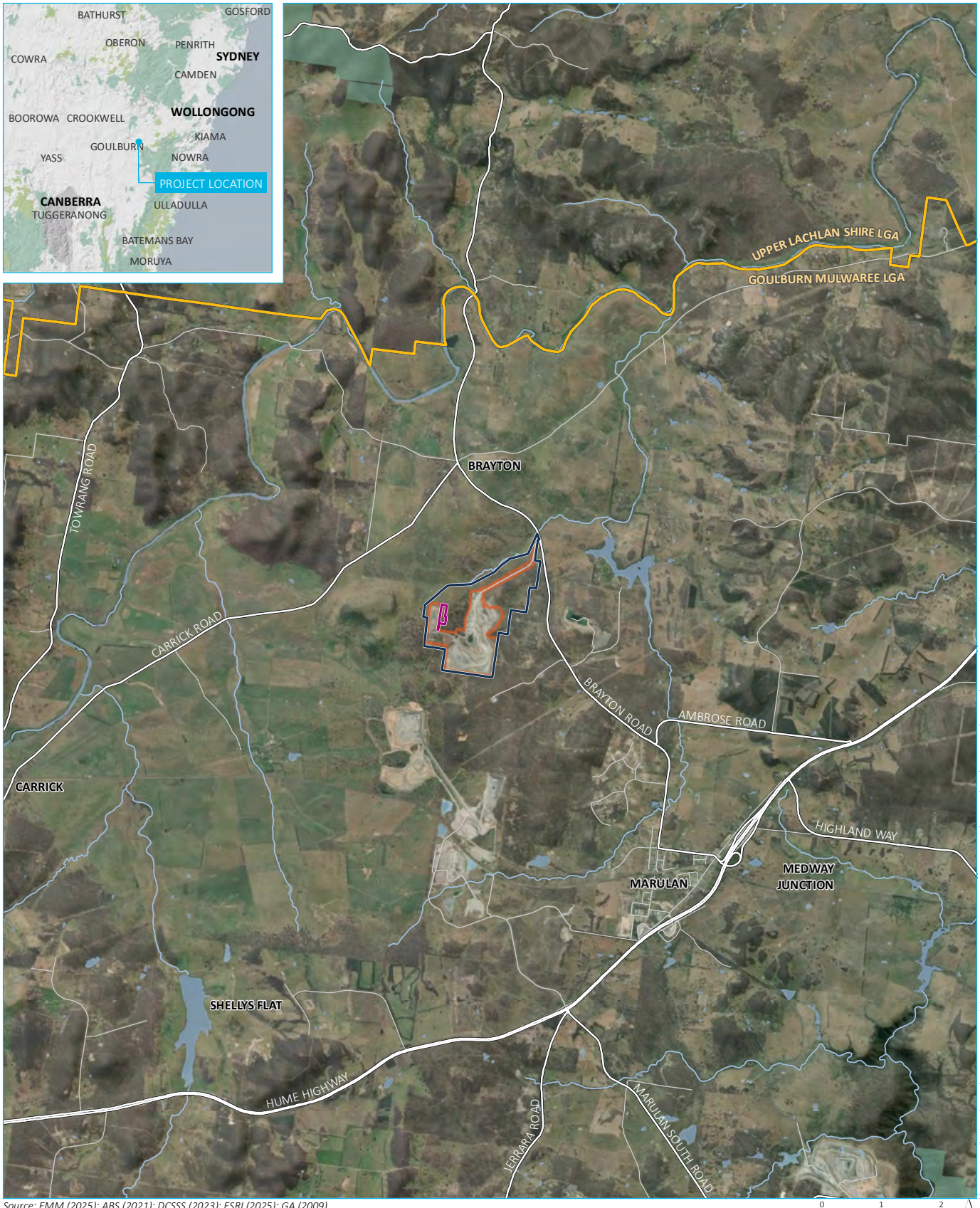
Gunlake Group currently owns and operates five concrete plants in Sydney, a National Association of Testing Authorities (NATA) accredited material testing laboratory, a cement import and distribution terminal at Port Kembla, and Gunlake Quarry. The group has other sites in the planning and development stages. Throughout its operations, Gunlake currently employs over 200 staff, numerous contractors and is the largest independent Quarry and concrete production company in NSW.

The applicant is:

Edward O'Neil
Managing Director
Gunlake Quarries Pty Ltd
ABN: 55118686963
Level 2, 53 Cross Street
Double Bay NSW 2028

Gunlake's nominated contact is:

David Kelly
Head of Development
Gunlake Quarries Pty Ltd
Level 2, 53 Cross Street
Double Bay NSW 2028



Source: EMM (2025); ABS (2021); DCSSS (2023); ESRI (2025); GA (2009)

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KEY

- Modification 3 disturbance area
- Site boundary
- Continuation project disturbance area

Existing environment

- Major road
- Minor road
- Named watercourse
- Waterbody
- NPWS reserve
- Local government area

INSERT KEY

- NPWS reserve
- State forest

Regional context

Gunlake Quarry Continuation Project
Modification 3 Report
Figure 1.1

EMM
creating opportunities

1.3 Approved operations

Under the Continuation Project Consent, the Quarry is approved to:

- operate for a period of 30 years
- extract hardrock down to 546 metres (m) Australian Hight Datum (mAHD)
- operate 24-hour Quarry Monday to Saturday, except 6 pm Saturday to 2 am Monday (with maintenance permitted outside of the hours of operation)
- dispatch of up to 4.2 million tonnes per annum (Mtpa) of Quarry materials by road.

The approved Continuation Project disturbance footprint is shown in Figure 1.2.

1.4 Schedule of lands

The Quarry is located at 715 Brayton Road, Marulan, NSW. Gunlake Quarries is the owner of the land.

The proposed modification relates to the following land:

- Lot 13 DP 1123374 (Quarry site and Biodiversity Area)
- Lot 1 DP1246715 (Quarry site)
- Lot 12 DP 1123374 (Biodiversity Area)
- Lot 271 DP 750053 (Biodiversity Area)
- Lot 1 DP 841147 (Biodiversity Area)
- Lot 2 DP 841147 (Biodiversity Area).

1.5 Modification overview

It is proposed to modify the Consent to allow expansion of the Western Emplacement (Figure 1.2) and operations in this area. This will increase the approved Continuation Project disturbance area by 2.997 ha of land, all within the currently approved Site Boundary.

No other changes are proposed to the quarry or its operations.

This modification report is supported by:

- an Aboriginal cultural heritage assessment (ACHA) (Appendix A) that assesses impacts to archaeological values
- a streamlined Biodiversity Development Assessment Report (BDAR) (Appendix B) that assesses the impacts to flora and fauna.



Source: EMM (2025); ESRI (2025); DFSI (2017); GA (2011)

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KEY

- Modification 3 disturbance area
- Site boundary
- Continuation project disturbance area
- Major road
- Minor road
- Topographic contour (10 m interval)
- Named watercourse
- Waterbody

Local context

Gunlake Quarry Continuation Project
Modification 3 Report
Figure 1.2

EMM
creating opportunities

2 Description of modification

2.1 Proposed changes to operations

The Quarry's hardrock resource is beneath topsoil, subsoil and overburden. The majority of this material has already been removed to allow pit development. Soil and topsoil has been stockpiled separately for use in rehabilitation. Overburden has been placed in the eastern or western emplacements (Figure 1.2).

There are pockets of uneconomic material within the economic hardrock resource that cannot be dispatched from the Quarry as products. This material needs to be deposited in the emplacements. The volume of this uneconomic material encountered during quarrying is greater than estimated at the time that the *Gunlake Quarry Continuation Project (SSD-12469087) Environmental Impact Statement* (EMM 2021) was prepared. Therefore, additional emplacement area is required to accommodate the additional material.

The Eastern Emplacement area is constrained by the processing area and biodiversity areas. Rehabilitation and revegetation of the outer eastern face is largely complete. Therefore, this emplacement cannot be expanded to accept additional overburden. Accordingly, it is proposed to expand the Western Emplacement by 2.997 ha, all within the currently approved site boundary (Figure 1.2). This will increase the Continuation project disturbance area to about 108.4 ha.

Other than expanding the Western Emplacement area and operating in this area, there will be no other changes to the quarry layout, its operations or material transport as a result of the proposed modification.

2.2 Current conditions of development consent

Appendix 2 of the Consent provides the Development Layout, including the Continuation Project Disturbance Area and the location of the Western Emplacement.

2.3 Proposed changes to the development consent

It is proposed to replace the Development Layout Plan in Appendix 2 of the Consent with the 'Development Layout Plan - Revised continuation project disturbance area' with the Development Layout Plan provided in Appendix C of this modification application.

As described in Section 6.2, no changes to biodiversity offset conditions (B58–B62) of the Consent are required as a result of the proposed modification.

3 Strategic context

The strategic context for the Gunlake Quarry Continuation Project is detailed in Chapter 2 of the *Gunlake Quarry Continuation Project (SSD-12469087) Environmental Impact Statement* (EMM 2021). There have been no changes to the strategic context of the Quarry that relate to the proposed modification.

4 Statutory context

The statutory context for the Gunlake Quarry Continuation Project is detailed in Chapter 3 of the Gunlake Quarry Continuation Project EIS (EMM 2021).

There are no changes to the following statutory context matters as a result of the proposed modification:

- Permissibility (EIS Section 4.1) – the proposed modification does not affect the permissibility of the Continuation Project.
- Approval pathway (EIS Section 4.2) – the Continuation Project will remain an SSD, the modification pathway is described in Section 4.1.1.
- Other approvals (EIS Section 4.3) – the proposed modification does not affect the other approvals required by the Continuation Project.
- Pre-conditions to approval (EIS Section 4.4) – other than Goulburn Mulwaree Local Environmental Plan 2009, clause 7(2)(4) Terrestrial Biodiversity as described in Section 4.3.
- Mandatory matters for consideration (EIS Section 4.5 and Appendix C) – the proposed modification does not affect the mandatory matters for consideration.

4.1 Approval pathway

4.1.1 Section 4.55(1A) modification

Development consents for SSD may be modified under section 4.55 of the EP&A Act provided that the development as modified will be substantially the same development as the development for which consent was originally granted. Gunlake seeks to modify Development Consent SSD-12469087 pursuant to section 4.55(1A) of the EP&A Act.

The consistency of the proposed modification with section 4.55(1A) of the EP&A Act is summarised in Table 4.1.

Table 4.1 EP&A Act section 4.55(1A) requirements

Section 4.55(1A) requirements	Comment
(1A) **Modifications involving minimal environmental impact** A consent authority may, on application being made by the applicant or any other person entitled to act on a consent granted by the consent authority and subject to and in accordance with the regulations, modify the consent if—	
a) it is satisfied that the proposed modification is of minimal environmental impact, and	The proposed modification will not change the nature or impacts of the approved project, except for: • the loss of 2.997 ha of highly modified Goulburn-Lithgow Tableland Hills Grassy Forest (PCT 3738) in derived native grassland condition (DNG) and associated habitat for ecosystem credit species • the removal of an unmodified Stringybark eucalypt that was identified as having cultural values by one of the Aboriginal participants during the field survey. An assessment of impacts is undertaken in Section 6.

Section 4.55(1A) requirements	Comment
b) it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which the consent was originally granted and before that consent as originally granted was modified (if at all), and	The proposed modification relates to a 2.997 ha increase in the Continuation Project disturbance area on land all within the currently approved site boundary. It is not proposed to modify the activities of the project. It is not proposed to modify the site boundary. Therefore, the development would remain substantially the same as that originally approved by SSD-12469087.
c) it has notified the application in accordance with— i) the regulations, if the regulations so require, or ii) a development control plan, if the consent authority is a council that has made a development control plan that requires the notification or advertising of applications for modification of a development consent, and	This requirement will be carried out by the consent authority as per EP&A Act section 4.55(8).
d) it has considered any submissions made concerning the proposed modification within any period prescribed by the regulations or provided by the development control plan, as the case may be.	This requirement will be carried out by the consent authority as per EP&A Act section 4.55(8).

4.1.2 Matters for consideration

In accordance with section 4.55(3) of the EP&A Act, when determining a modification of development consent, the consent authority must take into consideration the matters referred in section 4.15(1) of the Act. The section 4.15(1) matters and where they are addressed in the Continuation Project EIS (EMM 2013) or in this Modification Report are detailed in Table 4.2.

Table 4.2 EP&A Act section 4.15(1) matters for consideration

Section 4.15(1) matter for consideration	Comment
In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:	
a) the provisions of:	
i) any environmental planning instrument, and	The proposed modification alters the Quarry layout, but not the activities as described in Chapter 3 of the Continuation Project EIS (EMM 2021). The Quarry, as modified, will remain consistent with the relevant environmental planning instruments, including the *Goulburn Mulwaree Local Environmental Plan 2009*, as described in Chapter 4 of the Continuation Project EIS.
ii) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred definitely or has not been approved), and	There are no proposed instruments that are relevant to the application.
iii) any development control plan, and	The Quarry, as modified, will remain consistent with the *Goulburn Mulwaree Development Control Plan 2009*.

Section 4.15(1) matter for consideration	Comment
iv) any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4, and	No planning agreements are in force or proposed.
v) the regulations (to the extent that they prescribe matters for the purposes of this paragraph) that apply to the land to which the development application relates,	The proposed modification does not contravene the provisions of the regulations.
b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,	The likely impacts of the Quarry are described in detail in the Continuation Project EIS (EMM 2021). The impacts of the proposed modification are described in Chapter 6 of this Modification Report.
c) the suitability of the site for the development,	The suitability of the site for the development was addressed in Section 7.3 of the Continuation Project EIS (EMM 2021). The proposed modification would not change the findings of the EIS as Quarry operations will continue to be generally in accordance with the operations described in the EIS.
d) any submissions made in accordance with this Act or the regulations,	This is a matter for the determining authority.
e) the public interest.	As described in Chapter 7 of the Continuation Project EIS (EMM 2021), the Continuation Project as a whole is considered to be in the public interest. This will remain the case for the proposed modification, which will not materially increase the impacts of the quarry on public amenity or the environment.

4.1.3 Environmental Planning and Assessment Regulation 2021

Section 100 of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation) lists the information required in a modification application. An outline of where this required information is provided is presented in Table 4.3.

Table 4.3 EP&A Regulation section 100 information requirements

Section 100 Content of modification application requirement	Where addressed
2. A modification application must contain the following information—	
a) the name and address of the applicant,	Section 1.1
b) a description of the development that will be carried out under the development consent,	Section 1.3
c) the address and folio identifier of the land on which the development will be carried out,	Section 1.3
d) a description of the modification to the development consent, including the name, number and date of plans that have changed, to enable the consent authority to compare the development with the development originally approved,	Chapter 2

e)	whether the modification is intended to— (i) merely correct a minor error, misdescription or miscalculation, or (ii) have another effect specified in the modification application,	Section 4.1
f)	a description of the expected impacts of the modification,	Chapter 6
g)	an undertaking that the modified development will remain substantially the same as the development originally approved,	Table 4.1
h)	for a modification application that is accompanied by a biodiversity development assessment report—the biodiversity credits information,	Chapter 6 Section 10.1 within Appendix B
i)	if the applicant is not the owner of the land—a statement that the owner consents to the making of the modification application,	The applicant is the owner of the land.
j)	whether the modification application is being made to— (i) the Court under the Act, section 4.55, or (ii) the consent authority under the Act, section 4.56.	The application is made to DPHI under section 4.56 of the EP&A Act.

4.2 Other approvals

The following approvals have been obtained for the Continuation Project as required under NSW legislation and summarised in the Continuation Project EIS (EMM 2021):

- a development consent under Part 4, Division 4.1 of the EP&A Act
- an amendment to EPL 13012 under the POEO Act to reflect the increase in extraction
- a water access licence under the WM Act for predicted take from the Goulburn Fractured Rock Groundwater Source
- approvals under section 138 of the *Roads Act 1993* for works associated with public roads or road reserves
- biodiversity offsets.

No change to any of the above approvals is required due to the proposed modification.

4.2.1 Biodiversity Conservation Act 2016

Biodiversity Conservation Act 2016 section 7.14 states:

> (2) The Minister for Planning, when determining in accordance with the *Environmental Planning and Assessment Act 1979* any such application, is to take into consideration under that Act the likely impact of the proposed development on biodiversity values as assessed in the biodiversity development assessment report. The Minister for Planning may (but is not required to) further consider under that Act the likely impact of the proposed development on biodiversity values.

The biodiversity impacts of the proposed modification are assessed in the Biodiversity Development Assessment Report - Small area assessment, provided in Appendix B and summarised in Section 6.2

Biodiversity impacts have largely been avoided through iterative design of the emplacement area, with reductions in footprint and complete avoidance of higher quality remnants of plant community type (PCT) 3738 and areas of Box Gum Woodland critically endangered ecological community (CEEC). The residual impact is limited to the loss

of 2.997 ha of highly modified PCT 3738 in DNG condition and associated habitat for ecosystem credit species. The proposed development will not require offsetting to compensate for residual impacts on PCT 3738.

There are no residual impacts to habitat for species credit species or serious and irreversible impact (SAII) entities.

4.2.2 Environment Protection and Biodiversity Conservation Act 1999

The BDAR (Biodiversity Development Assessment Report, Appendix B) considers impacts on species and ecological communities listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). It found that there is unlikely to be any matters of national environmental significance (MNES) present within the subject land; therefore, the proposed development is unlikely to have a significant impact on MNES.

4.3 Pre-conditions to approvals

4.3.1 Goulburn Mulwaree Local Environmental Plan 2009

One pre-condition to approval (as described in EIS Section 4.4) relates to biodiversity. The Goulburn Mulwaree Local Environmental Plan 2009, clause 7(2)(4) Terrestrial Biodiversity is listed as a pre-condition:

(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the development is consistent with the objectives of this clause and—

(a) the development is designed, sited and managed to avoid the potential adverse environmental impact, or

(b) if a potential adverse impact cannot be avoided, the development—

(i) is designed and sited so as to have minimum adverse impact, and

(ii) incorporates effective measures so as to have minimal adverse impact, and

(iii) mitigates any residual adverse impact through the restoration of any existing disturbed or modified area on the site.

The residual adverse biodiversity impact of the approved Quarry have been addressed through the provision of biodiversity offsets as required by Conditions B58–B62 of the existing Consent.

The proposed modification would result in an additional impact to 2.997 ha of highly modified vegetation consistent with PCT 3738. The modification area has been designed and located adjacent to existing disturbed areas to minimise biodiversity impacts and to avoid areas of higher ecological value.

The proposed modification is considered consistent with the biodiversity provisions detailed in clause 7(2)(4).

5 Engagement

Gunlake's Engagement activities regarding MOD3 include:

- 20 October 2025 – Gunlake briefed DPHI
- 19 November 2025 – Gunlake sought feedback from Community Consultative Committee (CCC) community members, and Council representatives: Director of Assets and Operations, R. Hughes, and Councillor, B. Kirk. No matters were raised
- 19 November 2025 – Gunlake briefed Goulburn Mulwaree Council Mayor, N. Dillon, and General Manager, S. Gallacher
- 21 November 2025 – Gunlake briefed Mrs Wendy Tuckerman MP, State Member for Goulburn.

Aboriginal consultation associated with the preparation of the ACHA is described in Section 6.1.

6 Assessment of impacts

6.1 Aboriginal heritage

An ACHA was prepared by EMM to assess potential impacts to Aboriginal heritage associated with the proposed modification (Appendix A). The assessment adopted the processes and methods outlined in the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010).

6.1.1 Aboriginal consultation and fieldwork

The twenty-eight Aboriginal stakeholder organisations that were identified in the consultation process for the Continuation Project were notified of the proposed modification. Three of the organisations responded and requested to be consulted with in regard to the project, and two of these were able to participate. They included one locally based Traditional Owner, as well as one Aboriginal community from the broader region interested in cultural heritage management.

A field survey and test excavation program was completed over two days in October 2025. Representatives of Pejar Local Aboriginal Land Council (PLALC) and Dean Delponte from Mundawari Heritage Consultants Pty Ltd (Mundawari Heritage Consultants) participated in the survey and test excavation.

The draft ACHA was provided to the RAPs on 22 October 2025, requesting any comments within 28 days. A reminder of the closing of the comment period was sent on 12 November 2025. No responses were received.

Documentation of the consultation process is provided in Appendix B of the ACHA.

6.1.2 Assessment

The modification area is not located on a landform commonly associated with cultural materials, such as a ridgeline or prominent hilltop. Other key environmental indicators of the presence of cultural materials, such as steep relief and remnant vegetation are absent, limiting the potential for sites, such as rockshelters and culturally modified trees to occur. The modification area has been subject to pastoral use, vegetation clearance and erosion which may reduce the likelihood of cultural material occurring.

The archaeological field survey and test excavations found no cultural heritage material present within the modification area. This included validation that previously documented sites, GL14c (#47-6-0789) and GL14a (#47-6-0787), which were originally identified as occurring primarily within the approved emplacement area and extending into the modification area, are no longer present within the modification area. These sites were subject to surface collection as part of the Extension Project's post-approval mitigation measures, and any artefacts formerly present may have been recovered during these activities.

An unmodified Stringybark eucalypt was identified as having cultural values by one of the Aboriginal participants during the field survey. This tree was documented as a cultural site, GL-AT1, and is considered to be of low significance. This value relates to the lack of broader inputs from the local Aboriginal community, and the absence of scientific significance, such sites having little anthropological or historical basis. The tree will be removed as part of the proposed modification as it is situated in the centre of the proposed emplacement area extension. The timber will be relocated to within one of Gunlake's biodiversity areas. This would have minor potential cumulative impacts to the regional cultural assemblage.

There is a low likelihood of tangible cultural materials being present within the modification area.

Discussions with RAPs have not identified any regional cultural places, stories or sites that would be affected by the project.

6.1.3 Management measures

The Continuation Project SSD approval (SSD-12469087) contains conditions to manage identified impacts to Aboriginal heritage, primarily the preparation of an Aboriginal Cultural Heritage Management Plan (ACHMP) which provides a framework for the identification, assessment and management of cultural heritage for all of its quarrying operations. The ACHMP provides a structured approach to managing cultural heritage, including consultation with the Aboriginal community, mitigation approaches and methods, and unexpected discoveries of cultural material, during construction activities and for the life of the project. Identified impacts to GL-AT1 will be managed via the ACHMP. Following determination of the proposed modification, if approved, the ACHMP will be reviewed, and updated as required, in accordance with Condition D5(d) of the Continuation Project Development Consent (SSD-12469087).

6.2 Biodiversity

A Biodiversity Development Assessment Report (small area assessment) BDAR was prepared by Nature Positive Advisory Pty Ltd to assess potential impacts to biodiversity associated with the proposed modification (Appendix B). The assessment was prepared in the 'streamlined assessment module - small area' in accordance with the requirements set out in Appendix C of the *Biodiversity Assessment Method* (BAM) (DPIE 2020).

6.2.1 Methods

The assessment for the BDAR included:

- Review of flora and fauna species, populations, communities and habitats information from the locality (generally within 10 km) from NSW and Commonwealth government databases and previous biodiversity assessments prepared for Gunlake Quarry.
- Field vegetation mapping within the modification area on two separate occasions, 28 June 2023 and 9 December 2024.
- Estimation of native vegetation cover in the modification area using aerial photography, regional mapping data and ground-validated vegetation mapping data of the Gunlake Quarry.
- Assessment of Native Vegetation Integrity using data obtained via a series of plots, as per the methodology outlined in Section 4.2 of the BAM.
- Determination of the potential for ecosystem credit species based on the PCTs present.
- Determination of the potential for species credit species at risk of serious and irreversible impact (SAII), predicted by the BAM-C, in accordance with Appendix C (streamlined assessment module – small area) of the BAM.

6.2.2 Assessment

i Existing environment

The only PCT present in the modification area is PCT 3738 (Goulburn-Lithgow Tableland Hills Grassy Forest). This area was originally mapped as PCT 731 (Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills, South Eastern Highlands Bioregion) which was also identified to occur in other parts of the Quarry site.

When the revised PCTs in eastern NSW came into effect and the BAM-C was subsequently updated on 14 April 2023, PCT 731 became unavailable for new assessments. Therefore, PCT 3738 was selected to replace PCT 731 in

the BDAR for the proposed modification. PCT 3738 is not associated with a BC Act-listed or EPBC Act-listed Threatened Ecological Community (TEC) within the BioNet Vegetation Classification.

PCT 3738 occurs as a derived grassland (DNG) community within the modification area. The tree and shrub strata are missing, and the dominant stratum is the ground layer dominated by grass species, with a high proportion of this cover comprising exotic groundcover (approximately 80%). This vegetation zone includes scattered trees and shrubs.

No SAII entities are likely to occur within the modification area.

ii Impacts on native vegetation and TECs or ECs (ecosystem credits)

In accordance with Section 9.2.1(1) of BAM, impacts on vegetation zones and threatened species habitat do not require offsets where:

- a vegetation zone representative of a critically endangered or endangered ecological community has a vegetation integrity score less than 15, and/or
- a vegetation zone representative of a vulnerable ecological community and/or threatened species habitat has a vegetation integrity score less than 17, and/or
- a vegetation zone that is not listed has a vegetation integrity score less than 20.

One vegetation zone was identified within the modification area, being PCT 3738, with a vegetation integrity score of 11. Accordingly, there are no impacts to vegetation zones in the modification area that require offsets.

iii Impacts on threatened species and their habitat (species credit)

There are no impacts on threatened species (species credits) that require an offset as per BAM subsection 9.2.2(2).

iv Impacts on EPBC Act listed species

The proposed modification will not result in any direct impacts on TECs, or threatened and migratory species listed under the EPBC Act and will not result in significant impacts on MNES.

6.2.3 Avoidance, minimisation and management measures

i Avoidance and minimisation

The key measure to avoid and minimise impacts has been through the iterative design of the expanded emplacement (see BDAR Figure 7-1). The original design would have resulted in impacts to areas of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions critically endangered ecological community (CEEC), including areas meeting the definitions for listing under both the BC Act and EPBC Act. The original design would also have resulted in impacts to woodland areas of PCT 3738 in higher condition.

The final design is sited to ensure impacts are restricted to the removal of highly modified DNG that has a low vegetation integrity score, that is dominated by weeds.

ii Management

The Continuation Project SSD approval (SSD-12469087) contains conditions to manage identified impacts to biodiversity, including the preparation of a Biodiversity Management Plan (BMP).

Following determination, if approved, the BMP will be reviewed, and updated as required, in accordance with Condition D5(d) of the Continuation Project Development Consent (SSD-12469087).

6.3 Other potential impacts

Table 6.1 Assessment of potential impacts

Aspect	Comment
Air quality	The current extent of the Western Emplacement was modelled as part of the *Gunlake Quarry Continuation Project (SSD-12469087) Air Quality Impact Assessment* (EIS Appendix F.4). The additional area of disturbance within the modification area would be about 2.997 ha, which is about 3% of the Continuation Project disturbance area, and would not reduce distance to sensitive receivers. The additional disturbance area would not materially change dust emissions from the Quarry or the dispersion modelling results.
Noise and vibration	The closest residence to the Western Emplacement is R4 (see Consent Appendix 4: Receiver Locations). This residence is owned by Gunlake. The closest residence to the Western Emplacement, that is not owned by Gunlake, is R5 (1.73 km away). There are two new residences south-west of R5 that are the same distance, or further, from the emplacement. The emplacement footprint would not reduce distance to sensitive receivers. There would be negligible difference in the noise level associated with the use of the additional land, and any change would be within the noise modelling uncertainty.
Water	There will be no change to the extraction rate or water use and only small changes to the disturbance area and required water management.
Visual	There is the potential for a fleeting view of the existing Western Emplacement (from about 1.3 km) from cars travelling along Carrick Road. However, this view is largely (or entirely) obscured by the ridge that runs along the southern side of Carrick Road. Extending the emplacement to the east (behind the existing emplacement from Carrick Road) will not change the character of any views.
Historical heritage	There are no historical heritage items within the quarry site. Therefore, the proposed modification will not change the impacts of the Continuation Project on historical heritage.
Traffic	The proposed modification will not change project traffic. Therefore, the proposed modification will not change the impacts of the Continuation Project on traffic.
Waste	Excess uneconomic material will be effectively and efficiently managed, eliminating the need for offsite disposal. Waste management at the site would be improved as a result. There will be no other changes to waste management.
Social	The proposed modification will not change the social impacts of quarry operations. Therefore, the proposed modification will not change the social impacts of the Continuation Project.

6.4 Proposed mitigation measures

Proposed mitigation measures for potential impacts caused by the modified project are provided in Table 6.2.

Table 6.2 Proposed mitigation measures

Aspect	Impact	Proposed mitigation measure
Aboriginal Heritage	Impact to GL-AT1	Integrate the modification project area into the Gunlake Quarry Continuation Project ACHMP, including: • methods for the relocation and long-term management of the felled Stringybark tree GL-AT1, determined in consultation with representatives of as Mundawari Heritage Consultants Pty Ltd.
Biodiversity	The loss of 2.997 ha of highly modified plant community type (PCT 3738) in DNG condition (with a low vegetation integrity score) and associated habitat for ecosystem credit species. There are no residual impacts to habitat for species credit species or serious and irreversible impact (SAII) entities.	Integrate the modification project area into the Gunlake Quarry Biodiversity Management Plan.
Water	Potential uncontrolled runoff from Western Emplacement causes erosion	The drainage channel at the current toe of the Western Emplacement will be reconstructed at the toe of the extended emplacement. The Gunlake Quarry Water Management plan will be updated accordingly.

7 Justification of modified project

The justification for the Continuation Project is provided in the Continuation Project EIS (EMM 2021).

The volume of uneconomic material encountered during quarrying is greater than estimated at the time that the Continuation Project EIS (EMM 2021) was prepared. Therefore, additional emplacement area is required to accommodate the additional material.

This modification is required because expanding the emplacement footprint will allow the continued efficient operation of the quarry.

The modified development would remain substantially the same as that originally approved (SSD-12469087) because:

- no change to the nature of operations is proposed – the proposed modification does not introduce new types of activities or processes. Extraction, overburden handling, processing and transport methods remain as approved, the modification only increase the area used to emplace uneconomic material
- no change to the operational scale and output is proposed – annual transportation rates, transport routes and operating hours remain unchanged, so the project's scale and offsite impacts are consistent with the original approval
- the disturbance footprint is wholly within the currently approved site boundary – the expanded emplacement is located adjacent to the existing Western Emplacement.
- no new access roads will be required as the expanded emplacement will be accessed from the south via existing access.
- the modification area avoids all Box Gum Woodland in the surrounding area.
- there will be no material change in impacts to air quality, noise and visual amenity.

A modification under section 4.55 (1A) of the EP&A Act is appropriate as the modification will involve minimal environmental impact.

References

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

DPIE 2020, *Biodiversity Assessment Method*. Department of Planning, Industry and Environment.

EMM 2021, *Gunlake Quarry Continuation Project (SSD-12469087) Environmental Impact Statement*. Report prepared by EMM Consulting Pty Limited for Gunlake Quarries Pty Ltd.

Appendix A
Aboriginal cultural heritage assessment

EMM
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Gunlake Quarry Continuation Project - Modification 3

Aboriginal cultural heritage assessment addendum

Prepared for Gunlake Quarries Pty Ltd

November 2025

Gunlake Quarry Continuation Project - Modification 3

Aboriginal cultural heritage assessment addendum

Gunlake Quarries Pty Ltd

E230595 RP17

November 2025

Version	Date	Prepared by	Reviewed by	Comments
1	17 October 2025	Angus Lynch, Georgia Burnett	Alan Williams Philip Towler	Draft
2	21 November 2025	Georgia Burnett	Alan Williams	Final

Approved by



Dr Alan Williams FSA FRSA FRSN MAACAI MEIANZ MAIATSIS
Technical Lead, Aboriginal Heritage
21 November 2025

Level 10 201 Pacific Highway
St Leonards NSW 2065
ABN: 28 141 736 558

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Executive Summary

EMM Consulting Pty Ltd (EMM) have been engaged by Gunlake Quarries Pty Ltd (Gunlake) to assist them in a modification application for Gunlake Quarry, 715 Brayton Road, Marulan NSW. The quarry was originally approved in 2008 (MP 07_0074), with two state significant consents approved since that time to allow expanded operations, being the 'Extension Project' in 2017 (SSDA 7090) ; and the 'Continuation Project' (SSD-12469087) in 2023. Gunlake seeks to modify the Continuation Project Conditions of Approval to allow for an expansion of the Western Emplacement. No other changes are proposed to the quarry or its operations.

As part of the assessments undertaken for the above-mentioned approvals and their associated modifications, extensive Aboriginal heritage investigations have been undertaken. Specifically, a comprehensive Aboriginal cultural heritage assessment (ACHA) undertaken for the Extension Project that incorporated both field survey and test excavations between April 2015 and February 2016, as well as the development of an Aboriginal cultural heritage management plan (ACHMP) for the project in 2018. Subsequent activities have included the implementation of the ACHMP requirements (e.g. fencing off sites, artefact recovery, etc.) and various updates of the ACHMP in recent years to support the Extension and Continuation Projects, including through late 2023/early 2024, and in early 2025.

In August 2025, Heritage NSW supported the preparation of an addendum to the existing ACHA to inform the proposed modification. This includes identification of cultural materials within the proposed extension of the Western Emplacement (the 'modification project area'), determining any potential impacts, and developing suitable Aboriginal cultural heritage management strategies. Consultation for this current modification application has continued established processes from the previous assessments outlined above, and involved liaison and on-Country activities with locally-based registered Aboriginal parties (RAPs).

The Gunlake Quarry site and its immediate environs have been subjected to extensive archaeological investigation, and the archaeological and cultural resource of the region is well understood. Regionally, archaeological models stress the importance of flat and elevated terraces, ridge spurs and hills in close proximity to the region's major watercourses, where predominantly stone artefact sites of varying densities can be expected. The quarry site conforms well to this regional archaeological model. Previous investigation spanning back to 2008 have resulted in the identification of 18 Aboriginal sites within the Gunlake Quarry site, and of these, two artefact scatter sites, GL14c (#47-6-0789) and GL14a (#47-6-0787) were recorded to extend into the modification project area. However, due to a myriad of factors relating to historical disturbances, erosion and anthropogenic processes, neither site remains extant within the modification project area. Additional on-Country activities did not identify any surface or sub-surface cultural materials. However, one of the Aboriginal participants identified an unmodified tree as having cultural values, and which has been documented as a 'cultural' site in this addendum, GL-AT1.

The modification project will adversely affect GL-AT1, which is in the centre of the proposed development activities. No further cultural materials were identified or are considered likely to be affected by the project. From a cultural heritage management perspective, both GL14c and GL14a have already been subjected to cultural salvage as part of an earlier phase of work under for the Extension Project, and both sites have been designated as being 'partially destroyed' on the AHIMS database, and within the existing Gunlake Quarry ACHMP (Gunlake 2025). Since these databases (and associated documentation) provide legislative protection to cultural material and guide future investigations of the site, both the ACHMP and AHIMS database should be updated to document the findings of this report – resulting in revisions to the site boundaries to reflect that GL14c and GL14a do not extend into the modification project area, and that both sites can be considered 'destroyed' for cultural heritage management purposes.

It is recommended that the proposed modification proceed with caution, subject to the implementation of an unexpected finds protocol and the recommendations outlined below:

1. Management of the modification project area is integrated into the Gunlake Quarry Continuation Project ACHMP, which has established processes for Aboriginal consultation, mitigation approaches and methods, and protocols for unexpected finds and ancestral remains. The ACHMP should be updated to:

    a) In consultation with representatives of as Mundawari Heritage Consultants Pty Ltd, develop suitable approaches and methods for the relocation and long-term management of GL-AT1.

    b) Specify that there are no anticipated impacts to GL14c and GL14a resulting from the proposed modification, and the proposed modification is considered to have low risk of harming Aboriginal objects.

2. Where the heritage consultant changes through the project, suitable hand over should be undertaken to ensure no loss or mistranslation of the intent of the information, findings and future steps in heritage management occur.

3. A final copy of the ACHA should be provided to the RAP groups for their records.

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1 Introduction

1.1 Background and purpose

EMM Consulting Pty Limited (EMM) has been engaged by Gunlake Quarries Pty Ltd (Gunlake Quarries) to provide Aboriginal heritage inputs in their application to modify the Gunlake Quarry Continuation Project to allow for an expansion of the Western Emplacement at 715 Brayton Road, Marulan NSW (hereafter referred to as 'the modification area'). The quarry was originally approved in 2008 (MP 07_0074), with two new consents approved since that time to allow expanded operations, the 'Extension Project' in 2017 (SSDA 7090); and the 'Continuation Project' (SSD-12469087) in 2023. Gunlake seeks to modify the Continuation Project Approval to allow for an expansion of the Western Emplacement to the east. No other changes are proposed to the quarry or its operations.

As part of the assessments undertaken for the above-mentioned approvals and their associated modifications, extensive Aboriginal heritage investigations have been undertaken. Specifically, a comprehensive Aboriginal cultural heritage assessment (ACHA) undertaken for the Extension Project that incorporated both field survey and test excavations between April 2015 and February 2016, as well as the development of an Aboriginal cultural heritage management plan (ACHMP) for the project in 2018. Subsequent activities have included the implementation of the ACHMP requirements (e.g. fencing off sites, artefact recovery, etc.) and updates of the ACHMP in recent years to support the Extension and Continuation Projects, including through late 2023/early 2024, and in early 2025.

In August 2025, Heritage NSW supported preparation of an addendum to the existing ACHA to inform the proposed modification. As such, this report describes the results of archaeological investigation undertaken to identify the extent and significance of any physical remains of past Aboriginal occupation within the modification project area. The objectives of the investigation were to:

- liaise and consult with key Aboriginal community members and knowledge holders to identify areas and places of cultural value within or in the vicinity of the modification project area
- compile a review of existing environmental, historical and archaeological information for the modification project area, by identifying and summarising known and previously recorded Aboriginal heritage places, cultural values areas and landforms of archaeological interest in its immediate surrounds
- determine if any Aboriginal objects, places, cultural values areas, or areas of archaeological potential are present (or are likely to be present) within the modification project area, as well as areas of existing disturbance, through ground-truthing
- identify the type, nature, and extent of any Aboriginal sites, objects, archaeological deposits, potential archaeological deposits, and cultural values areas within the modification project area
- map the locations of known and potential Aboriginal sites, objects and deposits and cultural values areas identified
- assess the archaeological and cultural significance of the modification project area
- assess and identify heritage constraints and opportunities and the potential impacts of the project
- identify and recommend measures to mitigate any heritage impacts and risks to the project.

The project is being assessed as part of a modification of a State Significant Development project under Part 4 of the NSW *Environmental Planning and Assessment Act 1979*. Therefore, this report has been developed in accordance with the following relevant guidelines:

- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011)
- *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010)
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010).

1.2 Modification project area

The modification project area is located at 715 Brayton Road, Marulan NSW (Lot 13, Deposited Plan (DP) 1123374) and is approximately 2.997 ha in size (Figure 1.1 and Figure 1.2). Despite being within the Gunlake Quarry broader curtilage, the modification project area has not been previously subject to development activities but has had a long history of agricultural use.

1.2.1 Proposed development

The proposed modification seeks to increase the total project disturbance area allowed for the Continuation Project under Development Consent SSD-12469087 (the 'Consent'). Appendix 2 of the Consent provides a Development Layout Plan which indicates the Continuation Project disturbance area and site boundary.

It is proposed to modify the Consent to increase the approved Continuation Project disturbance area by approximately 2.997 ha to allow for an expansion of the Western Emplacement.

The works within the modification project area will involve bulk earthworks conducted by heavy machinery.

1.3 Legislative context

There are several Commonwealth and state Acts (and associated regulations) that manage and protect Aboriginal cultural heritage (Appendix A). These are summarised in Table 1.1.

Table 1.1 Commonwealth and State legislation relevant to the project

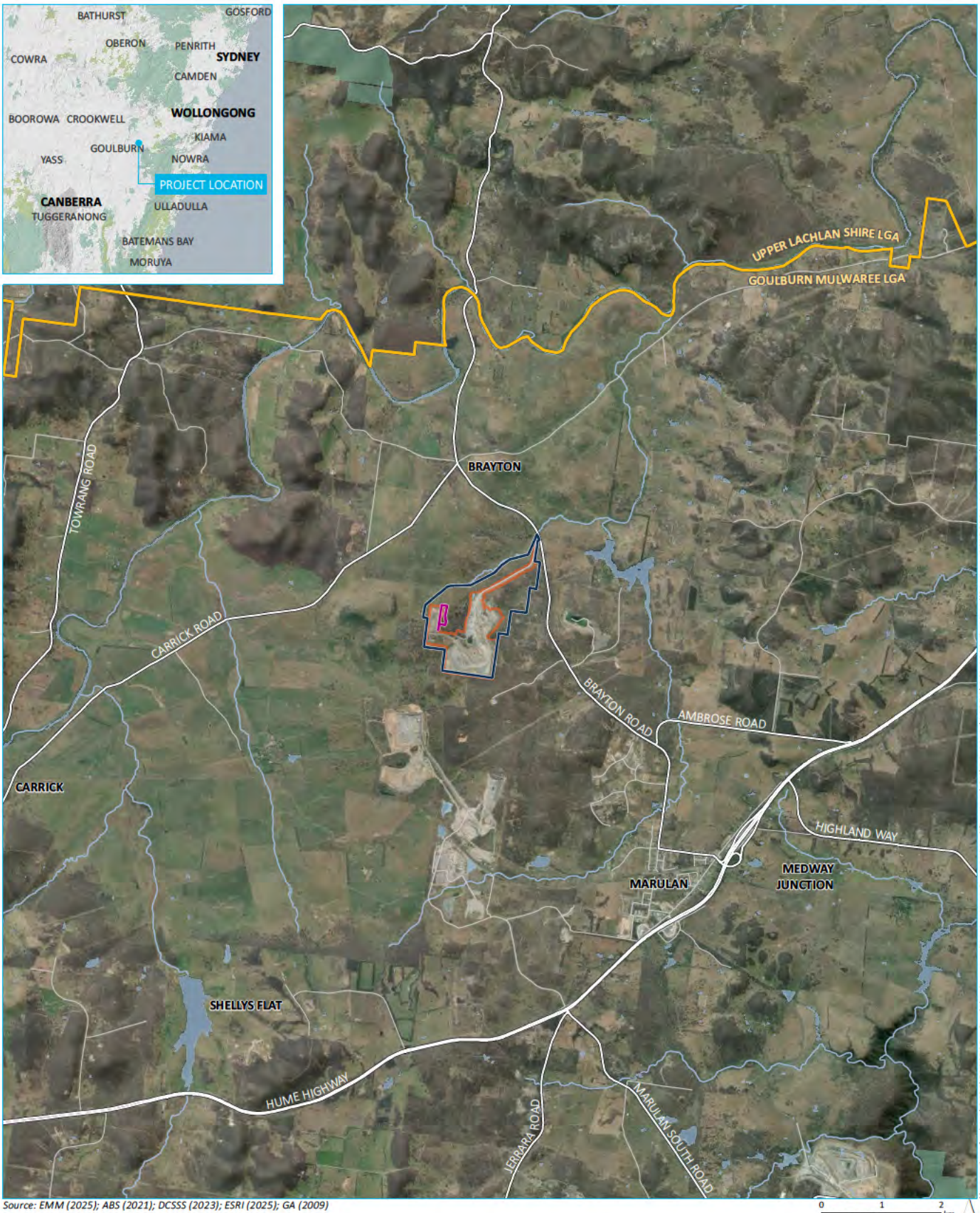
Legislation	Description	Relevant to the project?	Details
Commonwealth			
Environment Protection and Biodiversity Conservation Act 1999	Recognises sites with universal value on the World Heritage List (WHL). Protects Indigenous heritage places with outstanding heritage value to the nation on the National Heritage List (NHL), and significant heritage value on the Commonwealth Heritage List (CHL).	No	There are no Indigenous heritage places within the modification project area that are listed on the WHL, NHL, or the CHL.
Native Title Act 1993	Administers rights and interests over lands and waters by Aboriginal people. Provides for negotiation and registration of Indigenous Land Use Agreements (ILUAs). Often used in NSW to identify relevant stakeholders for consultation.	No	There are no Native Title claims listed with the National Native Title Tribunal encompassing the modification project area.
Aboriginal and Torres Strait Islander Heritage Protection Act 1984	Preserves and protects areas and objects of particular significance to Aboriginal people that are under threat from injury or desecration.	No	There are no areas or objects within the modification project area subject to a Declaration under the Act.

Legislation	Description	Relevant to the project?	Details
State			
Environmental Planning and Assessment Act 1979	Requires environmental impacts, including to Aboriginal heritage, to be considered in land use planning. Provides for the development of environmental planning instruments, including State Environmental Planning Policies and Local Environmental Plans.	Yes	The proposed project is being assessed under Part 4, Division 4.7 of the Act. As a modification, advice has been sought from Heritage NSW as to the contents and nature of the assessment. These requirements stipulate that an addendum to existing Aboriginal cultural heritage assessment is required (in broad accordance with standard Heritage NSW procedures and guidelines) to assess whether the project has the potential to impact on Aboriginal objects, sites, or places of Aboriginal heritage significance.
National Parks and Wildlife Act 1974	Provides blanket protection for all Aboriginal objects and declared Aboriginal places. Includes processes and mechanisms for development where Aboriginal objects are present, or where Aboriginal Places are proposed for harm.	Yes	While elements of this Act do not apply to SSD projects, the potential impact on Aboriginal objects generally still requires consideration as a part of the assessment needs of such projects.
Aboriginal Land Rights Act 1983	Establishes Local Aboriginal Land Councils (LALCs). Allows transfer of ownership of vacant crown land to a Local Aboriginal Land Council. The Office of the Registrar, *Aboriginal Land Rights Act 1983 (ORALRA)*, registers Aboriginal land claims and maintains the Register of Aboriginal Owners. Often used in NSW to identify relevant stakeholders for consultation.	No	The project is within the boundaries of the Pejar Local Aboriginal Land Council, who are a RAP for this project and have been consulted.

1.4 Limitations

This report is based on existing and publicly available environmental and archaeological information (including the Aboriginal heritage information management system (AHIMS) data) and reports about the modification project area. The background research did not include any independent verification of the results and interpretations of externally sourced existing reports (except where the ground-truthing was undertaken). The report further makes archaeological predictions based on these existing data and targeted ground-truthing, and which may contain errors depending on the accuracy of these third-party studies and the extent of ground-truthing investigations.

This report does not consider historical and/or built heritage unless specifically related to Aboriginal heritage values.



Source: EMM (2025); ABS (2021); DCSSS (2023); ESRI (2025); GA (2009)

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GDA2020 MGA Zone 56

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KEY

- Modification project area
- Site boundary
- Continuation project disturbance area

Existing environment

- Major road
- Minor road
- Named watercourse
- Waterbody
- NPWS reserve
- Local government area

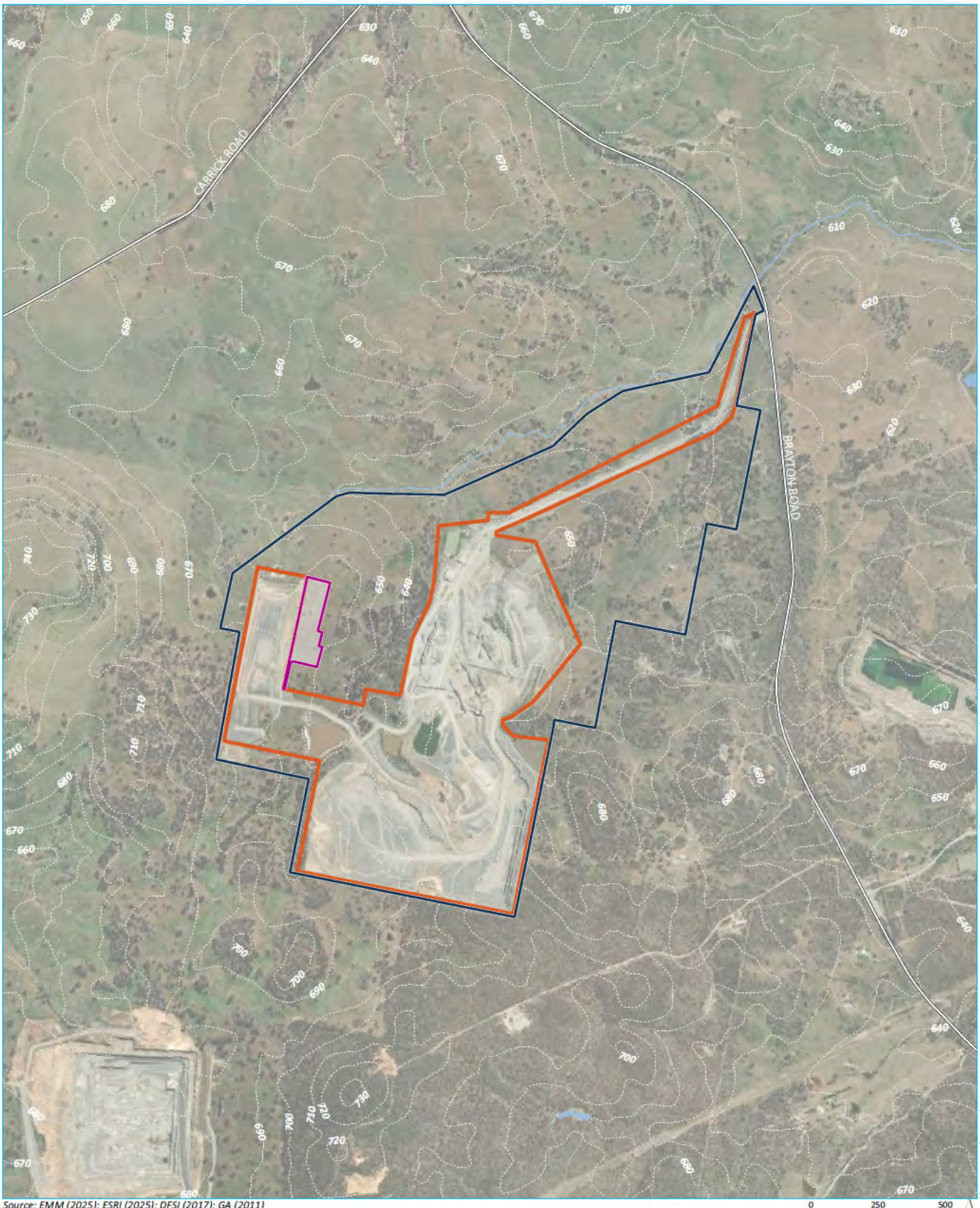
INSERT KEY

- NPWS reserve
- State forest

Regional context

Gunlake Quarry Continuation Project
Modification 3
Aboriginal Cultural Heritage Assessment
Figure 1.1

EMM
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Source: EMM (2025); ESRI (2025); DFSI (2017); GA (2011)

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KEY

- Modification project area
- Site boundary
- Continuation project disturbance area

Existing environment

- Major road
- Minor road
- Topographic contour (10 m interval)
- Named watercourse
- Waterbody

Local context

Gunlake Quarry Continuation Project
Modification 3
Aboriginal Cultural Heritage Assessment
Figure 1.2

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2 Aboriginal consultation

2.1 Key findings

- The assessment adopted the processes and methods outlined in DECCW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010). In discussion with Heritage NSW, early stages of this process were not implemented, and rather established processes under a previous ACHA and active ACHMPs for the project have been continued.
- The consultation process included 28 Aboriginal individual and/or organisations who have been involved in previous phases of the Gunlake Quarry activities. These included a number of locally based Gundungurra and Ngunawal traditional owners, as well as others interested in cultural heritage management more broadly.
- Field survey and test excavation program was completed over two days in October 2025. These included representatives of Pejar Local Aboriginal Land Council (PLALC) as well as Mundawari Heritage Consultants Pty Ltd (Mundawari Heritage Consultants).
- A draft report was provided to Aboriginal stakeholders for review and comment on 22 October 2025, for a period of 28 days. A reminder of the closing of the comment period was sent on 12 November 2025. No responses were received during this period.

2.2 The process

Aboriginal consultation for this project has been undertaken in accordance with procedures set out in the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010). These guidelines identify a five-stage process:

1. Pre-notification – identification of the Aboriginal individuals and/or communities relevant to the modification project area by contacting several state government agencies.
2. Notification – contacting all Aboriginal individuals and/or communities identified in Stage 1 to determine their interest in being consulted during the project. This includes direct communication and the placement of advertisements in local media seeking further expressions of interest from Aboriginal individuals and/or communities that may have been missed through Stage 1. Those Aboriginal individuals and/or communities that wish to be consulted become a 'registered' Aboriginal party (RAP).
3. Presentation of project information/assessment methodology – briefing RAPs about the project and scope of any Aboriginal heritage assessment and investigations. This is usually undertaken through written correspondence, but can include meetings, and may undergo several iterations through the project as the nature of the assessment changes (e.g. surface ground-truthing may lead to a requirement for test excavations).
4. Impacts and mitigation strategies – discussion of potential impacts to cultural materials and mitigation options with the RAPs prior to developing the ACHA. This is often undertaken either onsite at the end of any field program and/or as part of Stage 4.
5. Report review – the RAPs are provided an opportunity to review and comment upon the draft ACHA, to contribute input into the overall findings, significance, and management of cultural heritage.

The consultation process for this project had two aims:

1. to comply with the mandated consultation procedures to obtain input on the ACHA process

2. to identify cultural places and intangible values that may be affected by the project.

In discussions with Heritage NSW, it was determined that established processes at Gunlake Quarry under the existing Continuation Project ACHMP could be utilised in the consultation process. This document included a list of established RAPs who were contacted for this project. As such, for the purposes of this addendum, the project began at (3) above.

2.3 Continuation project modification 3

An established list of 28 Aboriginal individuals and/or organisations have been involved in previous assessments and/or post-approval mitigations associated with Gunlake Quarry operations (Appendix B.2). These RAPs included locally based Ngunawal and Gundungurra traditional owner group, as well as a others with a general interest in cultural heritage management more broadly.

On 29 August 2025, each registered party was sent an email presenting information about the proposed modification project and set out the methods for gathering information about cultural significance. The email invited the 28 RAPs to provide feedback on the project, proposed methodology for archaeological assessment and any information they would like to share about cultural values relevant to the modification project area and surrounds. Feedback included endorsement of the approach, and a need to remain consistent with established process and activities already occurring on site.

In October, three locally based traditional owners were invited to participate in on-Country activities. One of these was unavailable, and ultimately only representatives of PLALC and Mundawari Heritage Consultants participated.

A complete log of actions and correspondence regarding Aboriginal community consultation is included in Appendix B and summarised in Table 2.1.

Table 2.1 Consultation process summary

Stage	Description	Date started	Date completed	Notes
1	Government Agency Pre-Notification	N/A	N/A	N/A
	Advertisement in the Tweed Valley Weekly	N/A	N/A	N/A
	Notification and registration of potential Aboriginal stakeholders	N/A	N/A	N/A
2/3	Presentation of information about the proposed project; and gathering information about cultural significance	29 August 2025	16 September 2025	Additional details are provided in Appendix B.4
	Fieldwork – survey	30 September 2025	30 September 2025	Additional details are provided in Section 6
	Fieldwork – test excavation	30 September 2025	1 October 2025	Additional details are provided in Section 6
4	Review of draft report	22 October 2025	19 October 2025	Additional details are provided in Appendix B.5

2.4 Aboriginal stakeholder feedback

During the field assessments, RAPs were invited to discuss and provide information about cultural values and oral history in relation to the modification project area should they wish to do so. Any comments received are summarised below and included in full in Appendix B.5:

- On-site discussions were held with Mundawari Heritage Consultant, Mr Delponte, who provided observations on the landscape and a number of scattered remnant mature trees within the modification footprint. Mr. Delponte identified one mature Stringybark eucalypt as a possible ancestral tree, based on the cultural and ecological values associated with this species observed within the modification project area (see Section 4.3). Mr Delponte recommended that archival recording of the identified eucalypt be undertaken prior to any disturbance. If removal of the tree is unavoidable, he advised that the tree should remain on-Country, either in its entirety or with significant sections retained within the landscape. Furthermore, he recommended that new tree saplings be planted in culturally appropriate areas to maintain the ecological and cultural functions associated with the tree species.

A copy of the ACHA has been provided to the RAPs (Appendix B.2). A draft report was provided to the RAPs on 22 October 2025 for a period of 28 days. A reminder of the closing of the comment period was sent on 12 November 2025. No responses were received during this period.

3 Existing environment

3.1 Key findings

The modification project area is located in the South Eastern Highlands bioregion, part of the Lachlan fold belt, and lies atop the Bindook porphyry complex, geologically characterised by rhyolitic to dacitic ignimbrite and lava, turbiditic quartzose and volcanic sandstone and siltstone.

The modification project area is situated approximately 5 km north-west of Marulan and is characterised by a landform pattern of undulating hills with level to moderately inclined slopes. Chapmans Creek, a 2nd order watercourse, runs adjacent to the north of the project area, feeding into Jaorimin Creek to the project area's east. The Wollondilly River runs approximately 4 km north of the site.

The modification project area lies in a landscape characterised by grasslands, which are present due to the historically extensive clearance of native vegetation to better facilitate pastoral uses of the land. Dense remnant dry sclerophyll forest with a shrub understorey is still present to the south-east of the quarry, and patches of trees and shrubbery exist in the modification project area's curtilage.

Intensive pastoral activities on the local landscape, in conjunction with the extensive clearance of native vegetation, would have impacted the upper layers of the soil profile in the modification project area. Furthermore, the intensive clearing may have destroyed Aboriginal culturally modified trees and significantly altered watercourses and artefact distribution, particularly potentially moving artefact down from crests into slopes and gullies.

3.2 Rationale

Understanding environmental context assists with predictions of archaeological potential, such as the likelihood of archaeological material being present in the landscape, its spatial distribution, and its preservation. Landscape features were an important factor in the choice of camping, transitory, and ceremonial areas used by Aboriginal people. Similarly, these landscape features and historical land-use plays a role in the level of preservation and the integrity of archaeological sites.

A landscape consisting of suitable topography, hydrology, geology, and soils has strong links with natural resources that would have been available to, and sought after, by Aboriginal people. Flora and fauna would have provided food, tools and ceremony (e.g. culturally modified trees) and proximity to fresh water was necessary for life and growing crops, as well as gathering fish and eels. Landscape features, such as sandstone overhangs, were useful for shelter. The material used in stone tool manufacture and stone arrangements were quarried from sites in the local and regional landscape.

3.3 Landscape overview

Bioregions are relatively large land areas characterised by broad, landscape scale natural features and environmental processes that capture large scale geophysical patterns at an ecosystem scale. The modification project area is part of the Sydney Basin Bioregion which covers large parts of the catchments of the Hawkesbury-Nepean, Hunter and Shoalhaven River systems. Bioregions may be further classified into smaller subregions which delineate significant geomorphic patterns within a bioregion, and are based on finer differences in geology, vegetation, and biophysical attributes (Bannerman & Hazelton 1990). The modification project area is situated withing the South Eastern Highlands bioregion, characterised by a temperate climate, extensive plateau remnants and granite basins, deeply incised rivers, and varied vegetation communities including grassy woodlands and heathlands.

The modification project area sits on a landscape surrounded by gentle undulating hills, largely cleared of vegetation aside from grass, shrubbery, and dispersed trees. The proximity to minor and major watercourses, namely Chapmans and Jaorimin Creek and the Wollondilly River increases the likelihood of Aboriginal artefacts to be present in and around the modification project area. However, it should be noted that while the presence of major water courses would have been a key resource for past occupation, they can be subject to significant flooding and scouring. As such, evidence of past occupation may be more likely to survive on elevated areas (e.g. terraces) adjacent to and above these watercourses. The extensive prior land clearance may affect this likelihood, with soil disruptions and tree uprooting moving or destroying artefacts, pushing them downhill into gullies and flats at the bottom of slopes.

3.4 Geology, geomorphology and soils

Geology, geomorphology and soil landscapes classifications and their boundaries provide pre-defined areas that are classified by several geographic features, and which are informative for the archaeological investigation. They provide localised information including landform patterns, soils, geology, rock outcrop percentage, land use and vegetation. This information provides another layer to categorise the landscape for the predictive model, additional to what a topographic description can provide. Soil landscape information builds on underlying geology and describes the depths of residual soils and colluvial soils and identifies areas that are characterised by erosion or skeletal soils and exposed bedrock, versus those that may contain a deeper profile where cultural material may be buried.

3.4.1 Geology

The nature of the surrounding and local geology, along with the availability and distribution of stone materials, has a number of implications for Aboriginal land use and archaeological investigations. Evidence of stone extraction, and manufacture, can be predicted to be concentrated in the areas of stone availability. However, stone can also be transported for manufacture and/or trading across the region. With reference to the *Goulburn Geology Map 1:250,000* (Thomas et al 2012), the modification project area is located in the south-eastern extension of the Molong-South Coast Anticlinorial Zone, a broadly north-south trending geological structural zone in the eastern central part of the Lachlan Belt Fold. The Lachlan Belt Fold is a Palaeozoic litho-tectonic assemblage underlying the south-east of Australia.

The quarry sits on a folded and deformed Bindook Porphyry Complex sequence of Devonian age volcanic rock, volcanoclastics, and intrusive lithologies. Dominant lithologies of granite occur to the west and south-west of the quarry, and basalt occurs to the west and north-west. The Bindook Porphyry can be divided into two-groups: the Jaorimin Ignimbrite and the Barrallier Ignimbrite. Ignimbrites are poorly sorted, pyroclastic rocks which are comprised mainly of pumice and ash. The Jaorimin Ignimbrite consists largely of pale pink to green-grey, densely welded, crystal-rich, rhyolitic ignimbrite, whilst the Barrallier Ignimbrite is dark blue-grey, massive, welded, crystal-rich, compositionally uniform dacitic ignimbrite. Neither of these materials are typically suited for stone tool manufacture, although finer grades of porphyry have manufacturable qualities and there are instances of this material being used in the Hunter Valley (Umwelt 2008).

The most abundant material in the region suitable for stone tool manufacture is quartz, which can occur in pockets and veins of geology such as granite and sandstone conglomerates. The material has been widely utilised in the broader region, yet it's quality can vary greatly, likely resulting in the necessitation of importing stone tools or more suitable material for manufacture from other areas.

3.4.2 Soil landscapes

Soil landscape classifications and their boundaries provide pre-defined areas that are classified by several geographic features, and which are informative for the archaeological investigation. They provide localised information including landform patterns, soils, geology, rock outcrop percentage, land use, and vegetation. This information provides another layer to categorise the landscape for the predictive model, additional to what a topographic description can provide. Soil landscape information builds on underlying geology and describes the depths of residual soils and colluvial soils and identifies areas that are characterised by erosion or skeletal soils and exposed bedrock versus those that may contain a deeper profile where cultural material may be buried.

Soil landscape mapping of the region indicates the modification project area is situated within the Bindook Road and Wyangala Soil landscapes. These soils typically comprise red and yellow acidic duplex soils with B2 horizons and sporadically bleached/non-bleached A2 horizons on side slopes and crests. These soils are similar to yellow and red podzolic soils, with red podzolic soils becoming more prevalent towards the south. Yellow podzolic soils and yellow and red earths occur to a lesser extent on footslopes. Overall, A horizon soils typically comprise a fine sandy loam, overlying a red/yellow clay loam, on top of a B horizon yellow/grey mottled tertiary clay soils or bedrock (100 cm depth) that predate Aboriginal occupation of the landscape. Soil erosion is minimal, with some gullying of drainage lines occurring south of the modification project area. During dry seasons and following bushfires, sheet erosion is expected to occur.

The modification project area lies within the Bindook Road Soil Landscape. The Bindook Road Soil Landscape occurs on undulating rises of low relief (10–40 m) and gentle slopes overlying Bindook Porphyry geology. The A soil horizon is typically sandy loams on crests and sideslopes overlying red sandy clay loams and bleached sandy clay loams. The A horizon overlies either weathering porphyry directly (typically on crests) or an intermediately B horizon on side slopes. These soils have formed in situ from alluvial-colluvial material derived from the parent rock (Hird 1991, p. 34).

3.5 Hydrology

Hydrological features are the most likely indicator of archaeological potential within the project site. Access to water, and the natural resources associated with it, would have influenced the distribution of habitation throughout the area. The Strahler stream order is a hierarchical system that ranks watercourses and maps watersheds, based on the connectivity and hierarchy of contributing tributaries, and is a useful measure for archaeological potential. In general, higher Strahler watercourses are usually more permanent and established, and as a result a foci of abundant resources due to reliable access to water, while lower order watercourses are more ephemeral, and likely only hold water during or shortly after periods of rain. For purposes of considering Aboriginal cultural heritage, higher densities of material evidence for past occupation are more likely to be identified within proximity of higher order, permanent watercourses due to the more abundant available resources.

Extensive historical land clearance of the modification project area and its curtilage may have had adverse effects on the watercourses in the area, and as such, may not be an accurate reflection of the pre-1788 landscape. At the closest point, the nearest waterway to the project is Chapmans Creek, a 2nd-order stream located approximately 200 m north-west of the modification project area at its closest point. Chapmans Creek connects to Jaorimin Creek to the east of the modification project area, which itself feeds into a small lake approximately 1,800 m to the north-east of the quarry. Jaorimin Creek then feeds into the Wollondilly River, a tributary of the Warragamba River, lies approximately 4,200 m to the north of the quarry. A number of the streams in the immediate surroundings of the quarry have been dammed to retain water in the drier months, and there is evidence of drainage diversion bunds being built into hillslopes as part of historic pasture improvement practices.

Chapmans Creek is a second-order tributary originating some 300 m to the north-west of the quarry, fed by two unnamed first-order streams, and runs for approximately 3,000 m before feeding into Jaorimin Creek. As well as providing water, these watercourses would have supported diverse plant and animal resources. The banks of the Wollondilly River and Jaorimin Creek have revealed numerous Aboriginal sites prior to contact, and Aboriginal sites are common within 200 m of waterways. The availability of permanent water would have been attractive to Aboriginal people in the past and the area was conducive to repeated or long-term occupation.

The groundwater impact assessment for the original Gunlake Quarry Project Cook (2008) identified nine water features (springs) which were essentially areas of shallow groundwater discharge that existed within 1,500 m of the quarry pit in the headwaters of Chapmans Creek (Figure 3.1). The report noted that the discharges from these types of springs likely vary in response to seasonal and climatic factors, but anecdotal evidence indicated that they are low-volume semi-permanent flows. Springs #4, 5 and 6 are likely to have influenced water availability in the modification project area: Spring 6 is in the approved pit area, Spring 5 is to the west of the project area but is northerly flowing and may have contributed to stream flows in proximity to the modification project area, and Spring 4 is approximately 400 m west of the modification project area flowing north.

The modification project area's proximity to several major and minor watercourses suggest that it would have had many natural resources necessary for sustaining life. Birds and mammals would have presented an abundant source of food, and the increased vegetation in the area prior to the clearance would have hosted far more fauna. Furthermore, increased animal activity, aside from a steady food source, would have proved material such as hides and bone for clothing and tools, a valuable resource considering the lack of suitable stone in the region.

3.6 Vegetation

The natural vegetation of a landscape is an important consideration when assessing Aboriginal archaeological potential because it provided Aboriginal people with food and natural resources used in everyday life. Bark from trees could be stripped to make canoes, shields, housing and other items. The vegetation itself provided food resources, such as edible plants, fruit and seeds, windbreaks and shelter, and also provided habitats for animals, such as possums and birds and herbivores, which could be hunted or skinned for clothing and other purposes (Attenbrow 2010; Turnbull et al. 2019).

The modification project area's proximity to both Chapmans and Jaorimin Creek, as well as the Wollondilly River, would have provided various flora and faunal resources, whilst these watercourses would have served as significant water sources. The modification project area is situated in an area mostly cleared of native vegetation, with some remnants of a dry sclerophyll forest with shrub understorey still present. Current vegetation is more specifically addressed in the Biodiversity Development Assessment Report (BDAR) being prepared for the addendum report (in prep).

3.7 Land use history

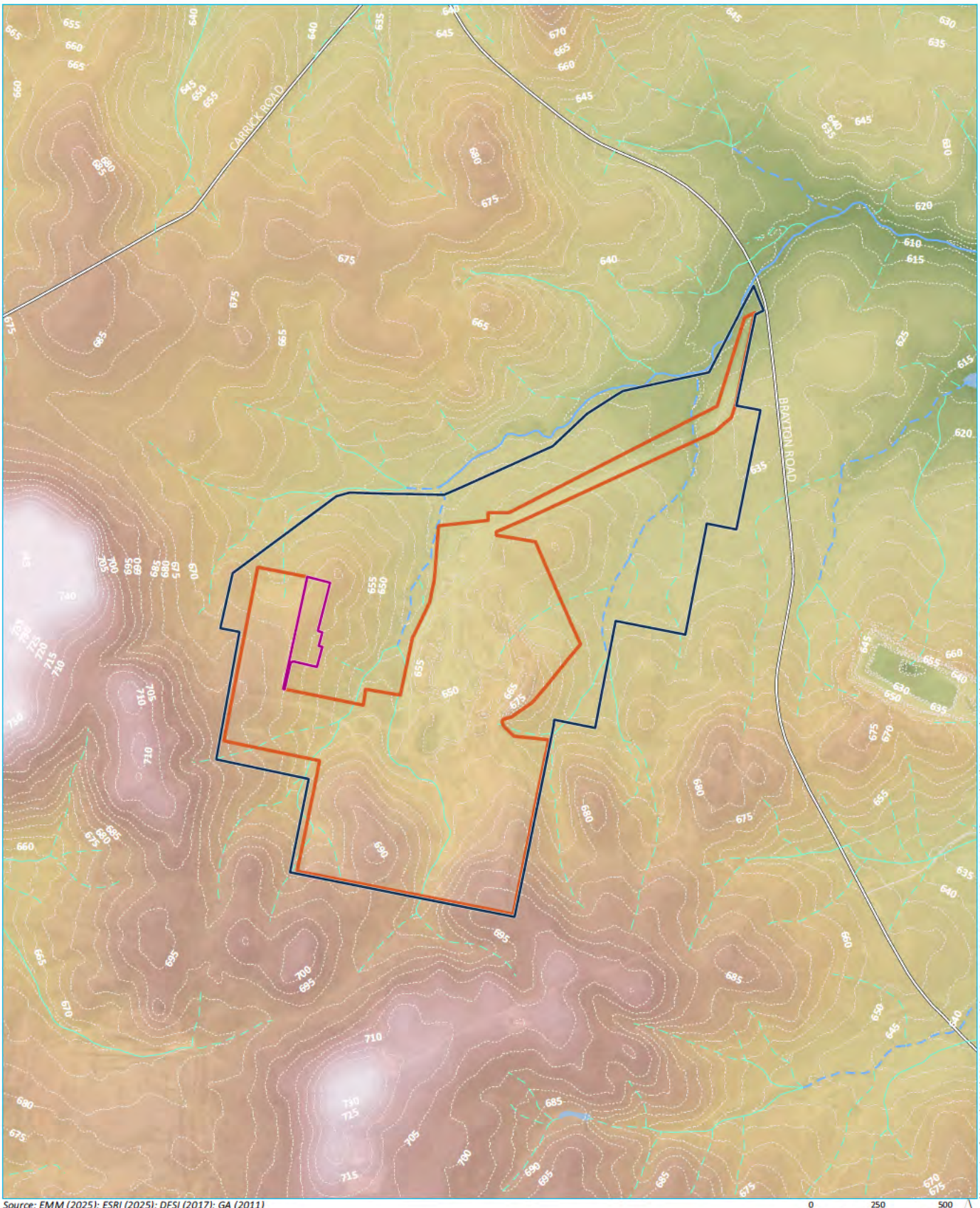
Previous land disturbance must be considered when determining the likelihood or potential of intact Aboriginal archaeological deposits. The Due Diligence Code of Practice **(DECCW 2010b, p. 18)** defines disturbed land or land already disturbed by previous activity as follows:

> Land is disturbed if it has been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable. Examples include ploughing, construction of rural infrastructure (such as dams and fences), construction of roads, trails and tracks (including fire trails and tracks and walking tracks), clearing vegetation, construction of buildings and the erection of other structures, construction or installation of utilities and other similar services (such as above or below ground electrical infrastructure, water or sewerage pipelines, stormwater drainage and other similar infrastructure) and construction of earthworks.

The land around the modification project area, excepting the south-east of the quarry, has undergone extensive land clearance for pastoral purposes, predominately for raising sheep. Vegetation clearance close to streams such as Chapmans Creek can alter their morphology, increase bank erosion and cause sediment aggradation. The process can significantly reduce the flow of surface water, especially in creek headwaters. Vegetation clearance also results in sheet erosion on crests and hillslopes which transports soils down-slope. This results in increasingly skeletal soils on crests and upper slopes and aggrading soils on lower slopes and foot slopes.

The extensive land clearance may have potential impacts on Aboriginal archaeology, particularly through the destruction of Aboriginal culturally modified trees such as scar trees and ring trees. Furthermore, land clearance would have greatly disrupted ecosystems and removed significant or important plant species for both native fauna and Aboriginal people living in the area. Another major impact is the disruption of soil layers as a result of this land clearance, leading to the mixing and reburial of artefacts from different sites and of different ages in areas where colluvium has aggraded, as well as the potential destruction of artefacts.

The village of Mooroowoolen was established as a private village in the early 1820s, existing under this name for a brief period before a new town was surveyed and laid out by Surveyor General Thomas Mitchell in 1834, which was officially gazetted as the town of Marulan a year later. In 1868, the town migrated 3 km north to the railway station upon the construction of the Main Southern Railway, yet the old cemetery still resides near the old town location, at the Bungonia Road intersection. Other towns established in the area included Bungonia (1836), Tallong (1869) and Wingello (1871), and the area has historically been used primarily for sheep and cattle grazing due to the areas' limited agricultural potential.



Source: EMM (2025); ESRI (2025); DFSI (2017); GA (2011)

0 250 500 m
GDA 1994 MGA Zone 55
N

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KEY

Modification project area
Site boundary
Continuation project disturbance area

Strahler stream order
1st order
2nd order
3rd order
4th order

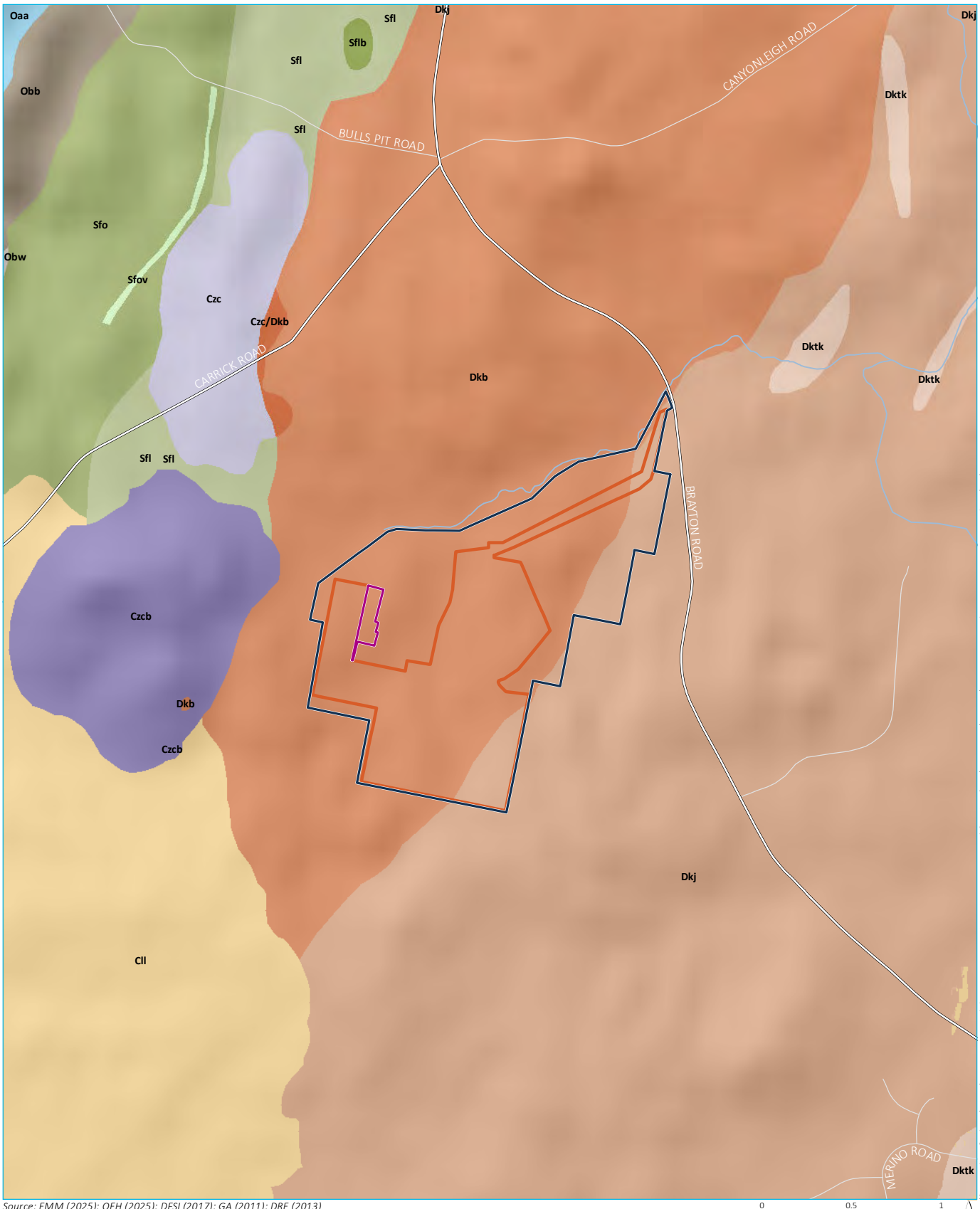
Existing environment
Major road
Minor road
Contour (5 m interval)
Waterbody

Terrain elevation
760 m
590 m

Topography and hydrology

Gunlake Quarry Continuation Project
Modification 3
Aboriginal Cultural Heritage Assessment
Figure 3.1

EMM
creating opportunities



Source: EMM (2025); OEH (2025); DFSI (2017); GA (2011); DRE (2013)

0 0.5 1 km

GDA 1994 MGA Zone 55

N

KEY

- Modification project area
- Site boundary
- Continuation project disturbance area

Geology 250K - Group | Unit

Adaminaby Group
- Abercrombie Formation (Oaa)

Bendoc Group
- Bumballa Formation (Obb)
- Warbisco Shale (Obw)

Bindock Group
- Barrallier Ignimbrite (Czc/Dkb)
- Barrallier Ignimbrite (Dkb)
- Joaramin Ignimbrite (Dkj)
- Kerrawarra Dacite Member (Dktk)

Cainozoic Units
- Billyrambija Dolerite (Czcb)
- Crookwell Basalt (Czc)

Lockyersleigh Suite
- Lockyersleigh Granite (Cll)

Mount Fairy Group
- Brayton Limestone Member (Sflb)
- Covan Creek Formation (Sfo)
- Longreach Volcanics (Sfl)
- Unnamed (Sfov)

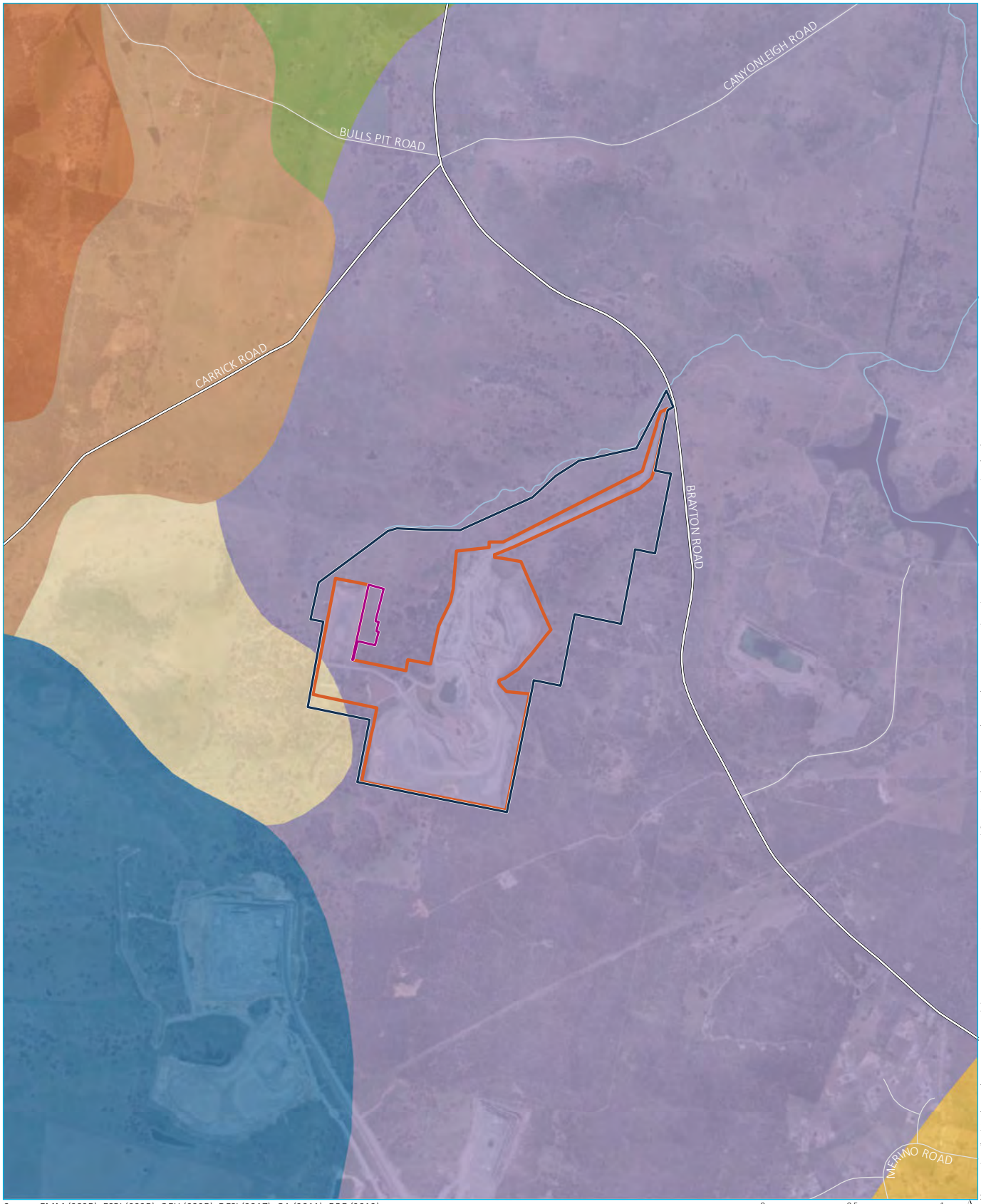
Existing environment
- Major road
- Minor road
- Named watercourse

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Geology

Gunlake Quarry Continuation Project
Modification 3
Aboriginal Cultural Heritage Assessment
Figure 3.2

EMM creating opportunities



Source: EMM (2025); ESRI (2025); OEH (2025); DFSI (2017); GA (2011); DRE (2013)

0 0.5 1 km

GDA 1994 MGA Zone 55

N

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KEY

- Modification project area
- Site boundary
- Continuation project disturbance area

Soil landscape

- SI5512bc | Blakney Creek
- SI5512br | Bindook Road
- SI5512ga | Garland
- SI5512li | Lickinghole
- SI5512mi | Midgee
- SI5512mn | Marulan
- SI5512wy | Wyangala

Existing environment

- Major road
- Minor road
- Named watercourse

Soil landscapes

Gunlake Quarry Continuation Project
Modification 3
Aboriginal Cultural Heritage Assessment
Figure 3.3

EMM
creating opportunities

4 Ethnohistorical context

4.1 Key findings

The modification project area lies on the lands of the Ngunawal and Gundungurra peoples. The Ngunawal territories extended to the south and south-west of Queanbeyan to Yass and east to beyond Goulburn, and the Gundungurra to the north and northwest of Goulburn and Berrima, down the Hawksbury River to Camden.

There are also two groups whose boundaries occur nearby to the east and north-east, namely the Wodi Wodi, a sub-group of the Tharawal people, whose territory extends to the north-east nearby the Shoalhaven River to Wollongong, and the Wandandian people, who have connections with the Yuin and Tharawal nations, whose territory extends to the south-east from Ulladulla to the Shoalhaven River and Nowra.

Project specific cultural values were discussed during the on-Country activities and focussed on native flora and fauna (which in part is protected under current approvals) and the broader cultural landscape within which the project is situated.

4.2 Documentary ethnography

4.2.1 Regional information

Information about the socio-cultural structure of Aboriginal society prior to European contact largely comes from ethno-historical accounts made by colonial settlers. These accounts and observations were often made after significant social disruption due to disease and displacement. As a result, this information is often contentious, particularly in relation to language group boundaries. Therefore, it is likely that language group boundaries were far more diffuse than the arbitrary demarcations drawn by colonial observers and this likelihood must be taken into consideration when using the existing literature.

According to Tindale (1974), the modification project area falls within *Ngunawal* Country extending to the south and south-west from Queanbeyan, Yass and east to beyond Goulburn to the Shoalhaven River; and *Gandangara* (or *Gundungurra*) Country whose territory extended to the north and north-west at Goulburn and Berrima, down the Hawkesbury River to Camden and whose name incorporates terms meaning west and east (Tindale 1974). There are also two groups whose boundaries occur nearby to the east and north-east: the Wodi Wodi whose territory extends to the north-east north of the Shoalhaven River to Wollongong; and the Wandandian whose territory extends to the south-east from Ulladulla to the Shoalhaven River and Nowra. Linguistic studies recorded in the 20th century suggest that the *Gandangara* and *Ngunawal* people may have shared a common language (Eades 1976, p. 6). There are also two groups whose boundaries occur nearby to the east and north-east; *Wodi Wodi* Country extending to the north-east of the Shoalhaven River to Wollongong and *Wandandian* Country whose territory extends to the south-east from Ulladulla to the Shoalhaven River and Nowra (Tindale 1974). It is important to remember that these groupings represent an account of Aboriginal groups post-contact, they may not necessarily present an accurate picture of the way lands were occupied or used in the past.

Tindale's work does not capture the local nuances of group names and complex relationships. Recent studies by Jackson-Nakano (2005) and Koch (2009, 2010) have illuminated upon the complexities of local Aboriginal language, place names and group names of the region. The Australian Institute of Aboriginal and Torres Strait Islander Studies (1996) provided an updated version of group boundaries that differs from Tindale's map.

The history of Aboriginal groups in the Alps and tablelands above is less detailed than their counterparts in more climate friendly areas (Mulvaney & Kamminga 1999, p. 298). Winter brings harsh weather to the south-east sector of Australia, which led to the movement of tribes seasonally. In the summer many other groups came to the area for "annual congregations" (Mulvaney & Kamminga 1999, p. 290). This in part was due to the arrival of the Bogong moths, which were a great delicacy and important resource. The Bogong moth migrates from surrounding states (Queensland, NSW and Victoria) during summer to the cooler caves of the Alps.

4.2.2 Contact and post-Contact overview

Much of the information on the practices of Aboriginal people has been lost due to settlement and interactions with European settlers. Certain generalisations can be made from early colonial records and subsequent research. Aboriginal people moved in small family groups, which belonged to clans, all of which were united by language and cultural affinities with ties to specific territories (Smith 1992). Historical records have noted large gatherings of people took place in Goulburn in the early 1800s (Smith 1992).

European explorers first visited the Southern Tablelands as early as 1798 when John Wilson was sent to the area by Governor Hunter (Chisholm 2006). His reason for exploring the area was to dispel the myth that convicts would be able to walk to China (Higginbotham 2009, p.21). He ascended Mt Towrang and viewed the Goulburn Plains before returning home. Stock and cattle stations were established in the 1820s throughout the Goulburn Plains and the wool industry dominated the area during the 1800s (Lester Firth Associates Pty Ltd 1983). Pastoralists set up stations run by the convict labour force and some of the wealthiest pastoralists ran their stations from Sydney or the Cumberland Plain sending sons or overseers to run the day-to-day operations (Higginbotham 2009, p.27). Marulan, the closest town to the extension area (5 km south-east), was established first in 1834 and then moved approximately 2 km to the north-west in 1868 when the Great South Railway Line was constructed. Other towns established in the area included Bungonia (1836), Tallong (1869) and Wingello (1871). Tourism to the Southern Highlands has increased as the improvements to the Hume highway connected the area to Sydney. The area was amalgamated into the Goulburn Mulwaree local government area (LGA) in 2005.

4.3 Information provided by RAPs

Consultation with the local Aboriginal community has formed a vital part of this assessment, and the field investigations provided an opportunity for the RAP representatives to discuss intangible values associated with the project modification area, such as connection to other cultural places, stories, view lines, contemporary values.

During the site survey on 30 September 2025, Dean Delponte noted several trees within the modification project area. These trees are Thin-leaved stringybark (*Eucalyptus eugenoides)*, and Dean highlighted the cultural values associated with the local fauna and flora, particularly as a source of protection from the elements. Dean also noted that a large tree lying in the centre of the modification project area may have been an ancestral tree.

Following this conversation, the Gunlake Quarry site contact, Kirsty Nielsen, explained that the vegetation in and around the modification project area had been examined as part of the modification to the continuation project, and that there were protection measures in place to limit the amount of disturbance to the environment.

The existing Western Emplacement is situated on the western boundary of the modification project area and completely obstructed the views of the landscape in that direction. [redacted] noted this during the site survey and highlighted that views of the surrounding area, specifically to the north, north-west, and west would have given past inhabitants nearly uninterrupted coverage of those areas from the modification project area, depending on the density of past vegetation.

5 Archaeological context

5.1 Key findings

Regional information, environmental characteristics, and previous land use of the modification project area indicate potential for artefact scatters and isolated finds across the region. These site types may be present across all landforms in the region, however primarily in close proximity to watercourses on elevated, level to gently inclined landforms.

Previous studies of the modification project area, the broader Gunlake Quarry and its surrounds are primarily constrained to cultural heritage management studies associated with quarrying and mining activities. Where available, these studies suggest a prevalence for open stone artefact sites. Open stone artefact sites are usually situated close to streams on elevated, level to gently inclined landforms, such as hill crests, hill spur crests and foot slopes. Subsurface archaeological deposits mostly occur on level to gently inclined landforms, such as hill crests and hill spur crests. The dominant raw materials for stone artefact production in the area are silcrete and quartz which are found regionally as outcroppings.

Regional studies of the South-Eastern Highlands and Southern Tableands notably of Birrigai (Tidbinbilla) and Wee Jasper 99 (Namadgi ranges) rockshelters reflect some of the earliest evidence of Aboriginal people in the uplands of Australia with occupation greater than 10,000 years old. Recent studies suggest that the region may have been occupied all year round by small mobile groups who could adapt more quickly to the harsh conditions of the region. Studies of excavated sites in the Namadji Ranges have established that Aboriginal people travelled along routes in this region from the late Pleistocene and into the late Holocene (Theden-Ringl 2018). Excavations at Lake George have revealed dates of occupation up to 50,000 years ago (50 ka), demonstrating that the climate of the region was likely similar to that of the Snowy Mountains around 21,000 years ago: cool with snow in the winter and mild but temperate in the summer.

Two artefact scatters, GL14c and GL14a (AHIMS #47-6-0789 and #47-6-0787, respectively) have previously been identified during earlier investigations of the Gunlake Quarry Continuation Project (EMM 2016) as extending into the modification project area. Both have been subjected to archaeological test excavation and surface collection, as authorised under an ACHMP for the Extension Project, and have been partially mitigated (i.e. destroyed) as a result.

5.2 Regional context

The first peopling of Australia occurred ~50 ka, and likely consisted of reasonably large groups of technologically advanced hunter-gatherers (Bradshaw et al. 2019; O'Connell et al. 2018; Turney et al. 2001). The peopling of the continent was rapid, with sites such as Devil's Lair (WA), Warratyi (SA), and Lake Mungo (NSW) all occupied within a few thousand years of arrival (Bowler et al. 2003; Hamm et al. 2016). Genomic research has shown that following these initial explorations of the continent, regional populations or nomadic sedentism, was established by ~40 ka (Tobler et al. 2017). These small populations were highly mobile, but remained within a broad spatial geographic area, dictated in general by the nature of resources and water availability. In the case of some of the arid parts of the continent, mobility encompassed thousands of square kilometres (Gould 1977) while major riverine corridors such as the Murray River had near permanent settlements (Pardoe 1995).

In NSW, the earliest evidence of Aboriginal people are human remains recovered from the lunette in Lake Mungo and dating to ~42 ka (Bowler et al. 2003; O'Connell et al. 2018). The presence of red ochre covering the remains are suggestive of a society with significant cultural and symbolic complexity (Langley et al. 2011). Near the coastal edge, the earliest populations were found at Cranebrook Terrace, near Penrith (western Sydney). Here a handful of rudimentary stone tools were found in an alluvial unit, some 8 m below the current surface, and which were dated to ~40 to 45 ka (Williams et al. 2017). However, it is not until ~21 ka, that regional populations appear to have become established in the South Eastern Highlands (Flood 1980).

The terminal Pleistocene and early Holocene (~18 to 8 ka) was characterised by significant environmental change, notably the rapid inundation of much of the coastal shelf, resulting in the reduction of the continent by ~21% (~2 million km²) (Williams et al. 2018) in tandem with improving climatic conditions – the Holocene climatic optimum (Williams et al. 2015). The excavation of a rockshelter (Y259) at Yarrangobilly Plateau in the Southeastern Highlands region indicates dates of 9700 to 9120 calibrated years before present (BP) suggesting occupation during the Holocene climatic optimum (Aplin et al. 2010). More broadly, these conditions resulted in increasing population growth, expansion of ranging territories, increasing sedentism (longer patch residence time) and the beginnings of low-level food production (e.g. aquaculture), and ultimately the initiation of social and cultural groupings observed in the late Holocene (Williams et al. 2015). The Southeastern Highlands region was heavily glaciated during the last Ice Age and in turn, distinctive landforms such as U-shaped valleys, cirques, aretes and tarns were formed from these former glaciers. As a result, fertile valleys and river systems were created and may have been utilised for occupation in the post-glacial period (Williams et al. 2015). Previously excavated sites in the highlands region suggest a relative continuity in the presence of short-term occupation beginning in the terminal Pleistocene and continuing into the early to mid-Holocene, with evidence of lithic technology gradually becoming more complex in the latter period (Theden-Ringl & Langley 2018).

The late Holocene saw significant population increase, with hunter-gatherers reaching their zenith of ~1.2 million km² at 0.5 ka, a tenfold increase on Pleistocene levels (Williams 2013). Data suggests that the highest populations during this time were in the southeast of Australia. Williams et al. (2015) suggest that this increase was likely a result of intensification of earlier technological advancements, including hafting technology, plant and seed processing, and localised landscape management (using fire), allowing climatic downturns to be successfully weathered. These included strong arid El Nino Southern Oscillation (ENSO) conditions between 4 to 2 ka, and increasingly turbulent climatic conditions during the Medieval Climatic Anomaly (1.3 to 1 ka) (generally wetter) and Little Ice Age (0.3 to 0.5 ka) (generally drier) (Williams 2013; 2015). A result of these denser populations was decreasing freedom of movement and the formation of strong classificatory kinship systems, complex cultural and symbolic landscapes based on geographic totemism (the 'Dreaming'), distinctive graphic art systems, land rights in the form of ritual property, and formalized exchange networks (Williams et al. 2015). For the South Eastern Highlands region, these conditions resulted in a significant increase in the archaeological visibility of past Aboriginal populations, with sites occurring in a much wider range of locations, and generally indicative of a more intensive use of the landscape.

Open artefact sites including artefact scatters and campsites are the most common archaeological feature in the Southeastern Highlands landscape. These site types mainly occur adjacent to permanent watercourses including rivers, creeks and lakes as an advantageous resource gathering areas (AECOM 2021, p. E-2). Flood (1980) categorised these open artefact sites into five categories, large lowland bases, medium sized lowland camps, montane valley camps, high summer camps and camps above snow-line. From these site types, flaked stone artefacts are the most common to feature across the South Eastern Highlands (AECOM, 2021, p. E-3). WE-1 on the northern end of Lake George, approximately 75 km from the modification project area, is a wide-ranging artefact scatter located on sand deposits dated to 6 ka to 2.4 ka. The assemblage found at WE-1 shows a change from early silcrete dominant assemblages to quartz rich assemblages with a high degree of bipolar artefacts showing a shift in tool production and technology (Hughes et al. 2014).

Rockshelters are a rare site type that occur in the South Eastern Highlands region that have been well-studied in order to understand former human occupancy. Rockshelters are found in well elevated highland contexts with a few exceptions in lower elevations below 745 m. A rockshelter, WJ99, located on the foothills of Namadgi National Park shows uninterrupted archaeological deposit spanning 12,000 years beginning in the terminal Pleistocene age (Theden-Ringl & Langley 2018).

There are a range of site types that occur within the Southeastern Highlands region including open artefact sites, rock shelters, culturally modified trees, stone arrangements quarry sites and burials.

5.3 Local information

Gunlake Quarry and the modification project area lies within the South-Eastern Highlands which has a long and extensive history of extractive industries for a variety of products. Quarrying activities for various deposits, including limestone, sandstone, marble, slate and iron ore has occurred since the early 19th century. This focus on quarrying has led to numerous local archaeological investigations and some larger regional investigations of the area. The region around the modification project area contains Lynwood Quarry (south-west), Peppertree Quarry and Marulan South Limestone Mine (south) and the existing Gunlake Quarry (adjacent). Extensive archaeological investigations have been undertaken since the 1980s across the region, primarily associated with quarrying activities (EMM 2016, 2018b, 2022; ERM 2006, 2012; Haglund 1986; RPS Harper Somers O'Sullivan 2009; Umwelt 2005, 2008, 2015).

Archaeological material is prevalent across the regional landscape. The Marulan South area has the greatest archaeological record in the region. Salvage excavation results at nearby Peppertree Quarry has indicated an average of 171 artefacts/m^2 in one instance (ERM 2012). The most common Aboriginal site types are open stone artefact sites. Open stone artefact sites are usually situated close to streams on elevated, level to gently inclined landforms, such as hill crests, hill spur crests and foot slopes. These may occur on all landforms as background scatter but are likely to occur as larger scatters on hill crest, hill spur crest and foot slope landforms. Subsurface archaeological deposits mostly occur on level to gently inclined landforms, such as hill crests and hill spur crests. To a lesser extent they are found on foot slopes. However, the intactness of the deposit is reliant on the condition and depth of soils.

The Gunlake Quarry site has been the subject of several cultural heritage investigations since 2008, and therefore the archaeological and cultural resource of the site is well understood. Three Aboriginal Cultural Heritage Assessments have been developed to guide earlier phases of the quarry's development (e.g. AASC 2008) and later expansion (e.g. CHMA 2014; EMM 2016), and investigations have continued into the post-approval heritage management and mitigation phase of the project (e.g. Gunlake Quarry 2025). Plate 2.2 illustrates the nature and distribution of the Aboriginal sites that have been identified as part of these earlier investigations.

The initial investigation for the hard rock quarry was undertaken in 2008 by Australian Archaeological Survey Consultants (AASC). The initial site covered ~230 hectares, and included project elements such as the quarry, processing and stockpile areas, overburden emplacement, and haul roads. Three small artefact scatters, all with no more than six artefacts at each site, were identified approximately 1 km east of the modification project area: GL1 (#51-6-0747), GL2 (#51-6-0748), and GL3 (#51-6-0749). All were identified as having low significance due to their small size; with other, more extensive artefact sites being represented in the archaeological record of the region. A further two sites, an isolated find (GL4; #52-4-0382) and one artefact scatter comprising two artefacts (GL5; #52-4-0383), were identified some distance (>4 km) away from the modification project area. These sites were similarly assessed as being of low significance. As part of the conditions of approval, all five sites (GL1-GL5) were subject to surface collection and have since been reburied outside of the project disturbance footprint (designated GL123 (#51-6-0750) and GL45 (#52-4-0384) on the AHIMS register).

In 2014, Gunlake sought to modify the pit and overburden embankment areas into areas not previously subject to investigation, and commissioned Cultural Heritage Management Australia (CHMA) to prepare an ACHA (CHMA 2014). Desktop assessment identified moderate–high archaeological potential within the assessment area, due to the presence of flat areas adjacent to an ephemeral watercourse (Chapman's Creek), as well as the relative proximity (i.e. within travelling distance) of Joarimin Creek and the Wollondilly River – permanent watercourses in the region. However, in line with other local studies, the assessment area was predicted to demonstrate evidence of sporadic use by prehistoric Aboriginal people, in the form of infrequent, low density open artefact scatters comprising less than 10 artefacts, and predicted that sites would be of low archaeological significance, if present (CHMA 2014, p. 40). No Aboriginal objects were identified during the survey. The absence of surface artefacts was ultimately attributed to highly eroded soils, extensive rocky outcrops and the considerable distance to permanent water (over 1 km) which arguably made the area unsuitable for anything other than transitory occupation. CHMA determined that only unpredictable deposits of artefacts would occur across the landscape (CHMA 2014, p. 2). No

test excavation was recommended because outcropping bedrock dominated the ground surface, limiting the potential for intact soil deposits. The assessment area was assessed to have low archaeological potential, and no further investigation was recommended.

In 2016, Gunlake sought to expand the existing quarry footprint, establish an overburden/waste rock storage area known as the Western Emplacement, and modify existing infrastructure (the 'Extension Project'). Gunlake commissioned EMM to undertake an ACHA for the project (EMM 2016). Similar to previous assessments, the desktop assessment concluded that artefact sites were the most likely site type to occur within the Extension Project area, with more complex and/or higher density sites likely to occur on hill crest, hill spur crest, and footslope landforms. The survey undertaken for the assessment identified 15 Aboriginal sites, including 12 artefact scatters and three isolated finds. Notably, part of the survey included a portion of the current modification project area (Plate 2.1). The majority of surface sites were identified as low-density artefact scatters, exhibiting <20 artefacts per site, and more commonly <5 artefacts per site. The highest densities of artefacts were identified on a hill spur crest on the western side of the site immediately adjacent to the current modification project area (MOD3), whereby four artefact scatters were identified, known as GL14a (n=32 artefacts), GL14b (n=3), GL14c (n=235), and GL14d (n=11) respectively. The subsequent test excavation of this area aimed to resolve whether the surface material was indicative of a more extensive subsurface deposit. The test excavation comprised 42 x 1 m^2 test pits along eight transects, targeting landforms of interest, and which recovered a total of 89 artefacts, averaging 2.12 artefacts/m^2. The majority of artefacts (95%) were recovered from the top 20 cm of soil, indicating an eroded and/or truncated landscape. Transect 5 that investigated GL14c, recovered the most artefacts (n=35), followed by Transect 8, which investigated GL14b and recovered 21 artefacts. All other transects recovered <20 artefacts or were culturally sterile. No new sites were identified as part of the test excavations, and the results indicated that GL14a-d may be inferred as a single larger site across the hill spur crest landform, albeit presented as fragmented concentrations.

A total of 18 Aboriginal sites have been identified within the Gunlake Quarry site, and of these sites, two – GL14c and GL14a – extend into the MOD 3 modification project area (Plate 5.1). Except for sites GL14a–d, all of the sites were considered to have low significance due to the limited archaeological potential, their small size, and lack of further research potential. GL14a–d were assessed as retaining moderate significance due to the density of material present, although significance was constrained by the perceived historical disturbance of the cultural deposit. The ACHA recommended surface collection of all impacted cultural material, as well the development of an ACHMP to further guide the investigation, assessment and management of all cultural heritage sites (whether recorded or as yet unidentified) into the future.

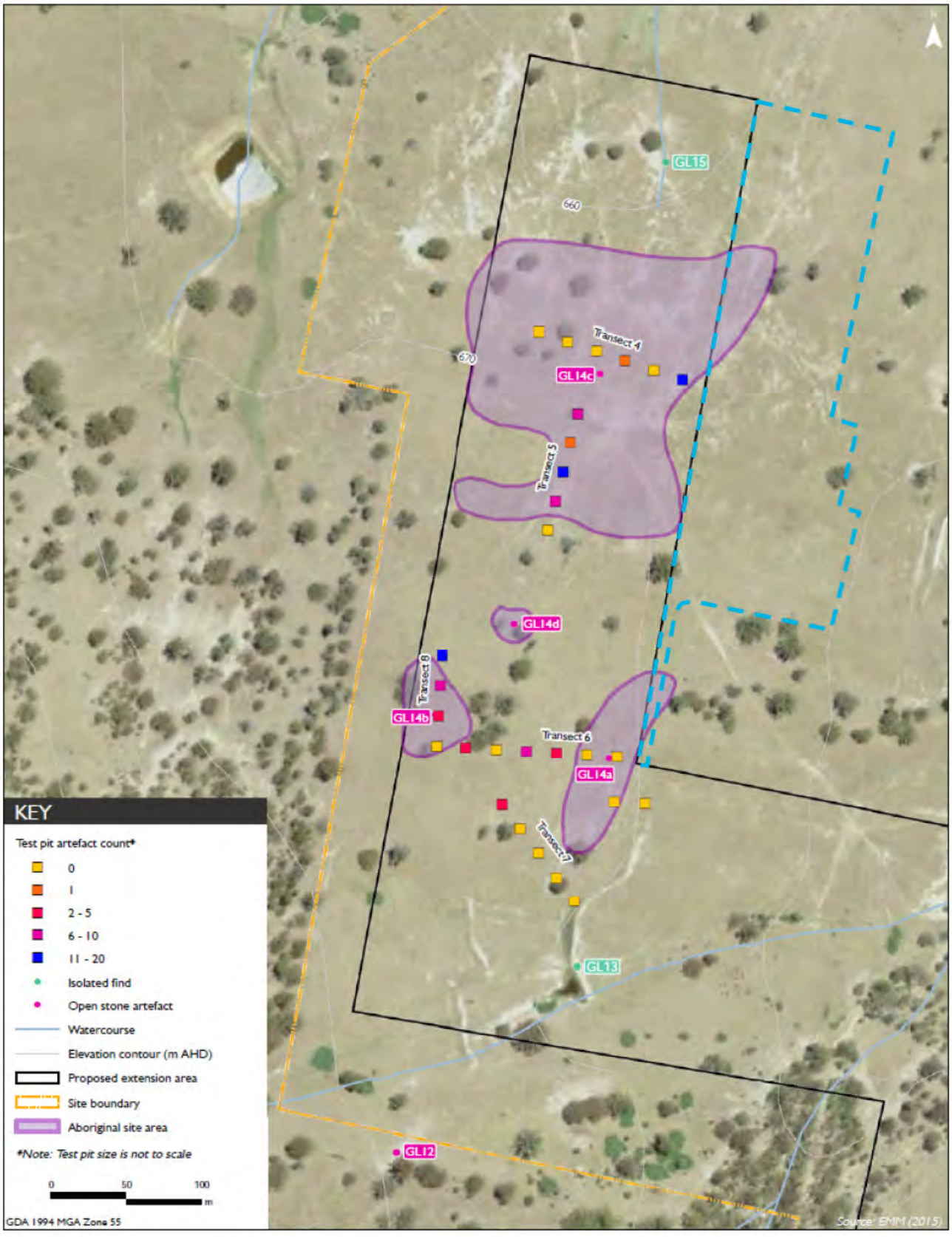


Plate 5.1 **Aboriginal sites identified as part of the Gunlake Quarry Extension Project (EMM 2016). Moderate density artefact scatter sites GL14c (#47-6-0789) and GL14a (#47-6-0787) extend into the modification project area (the extent of which is shown in blue)**

EMM prepared an ACHMP for the Extension Projects in 2018, and this document has been subject to ongoing update since that time – the latest updates having occurred in mid-2025 for the Continuation Project (Gunlake Quarry 2025). The ACHMP includes measures to protect, monitor, and manage identified and newly documented Aboriginal sites, facilitate archaeological investigations, and ensure ongoing consultation with RAPs and Heritage NSW. Under the ACHMP, 13 of the 18 sites identified during the various assessments have been salvaged in accordance with the various methodologies outlined in the document. Notably, the ACHMP enabled collection of the complete extent of the Aboriginal sites that were proposed to be partially or totally destroyed by project-related impacts. In 2018, a total of 867 artefacts were collected from 11 of the 18 previously identified Aboriginal sites, including GL14c and GL14a. Consistent with the findings of the survey in 2015, the majority of artefacts (n=791) were recovered from site GL14c on the hill spur crest within the Extension Project emplacement footprint. Nearby, on the same hill, an additional 56 artefacts were recovered from GL14a and 8 artefacts from GL14d. No artefacts were found at GL14b, despite three artefacts having been identified there in the initial survey. GL15 was inspected but the isolated artefact was not found. Artefact density was particularly high in areas subject to extensive scald exposure, particularly on the hill crest. Ground surface visibility in the southern half of the emplacement area was more obscured by vegetation and artefact density decreased toward the southern boundary of the emplacement area.

At the remaining sites to the southeast, artefact distribution was much sparser. As part of the surface collection works in 2018 twelve artefacts were recovered from sites GL7, GL8, GL9, GL10 and GL11. GL5EXT and GL6 were inspected by the salvage team but artefacts were not found. While it is inevitable that not every artefact within the Extension Project footprint would have been identified and collected, the extensive sample that was collected provided a representative and comprehensive sample of archaeological material at the site.

A variety of artefact raw material types and qualities were present in the recovered assemblage. Silcrete was the predominant raw material recovered during the surface collection, comprising 44% of all artefacts collected (n=375). Outcropping silcrete has been identified in the region, from the banks of Marulan Creek. Chert was also dominant within the assemblage, comprising 31% of the total (n=273). Quartz flakes and cores were found across most of the sites, comprising 19% of the assemblage (n=166). Quartz outcropping was not observed within the extension area but is a locally and regionally available raw material and would likely be available nearby. Other materials included IMT (indurated mudstone/tuff), a hard fine grained igneous rock that made up less than 5% of the assemblage, quartzite (less than 2%) and a single white chalcedony flake.

Overall, it was considered that the results of the 2018 salvage collection confirmed the interpretation of the project area as presented in the Continuation Project ACHA. The ACHA identified the most common Aboriginal site types in the regional context were open artefact scatters and these were most likely to occur on elevated, level to gently inclined landforms that overlook streams. Survey and test excavation results showed that GL14a, b, c and d (associated with a low hill spur crest and its upper hill slope) contained the greatest concentration of stone artefacts, suggesting that these were the most intensely occupied area within the extension area. Dominant raw materials for stone artefact production in the area were silcrete, chert and quartz.

5.4 Aboriginal Heritage Information Management System search results

Heritage NSW maintains the Aboriginal Heritage Information Management System (AHIMS), a database of registered Aboriginal heritage sites in NSW. An AHIMS search was undertaken on 6 January 2025, encompassing a wide area centred on the modification project area (AHIMS service ID: 963385). The results are summarised in Appendix C.2 and Table 5.1.

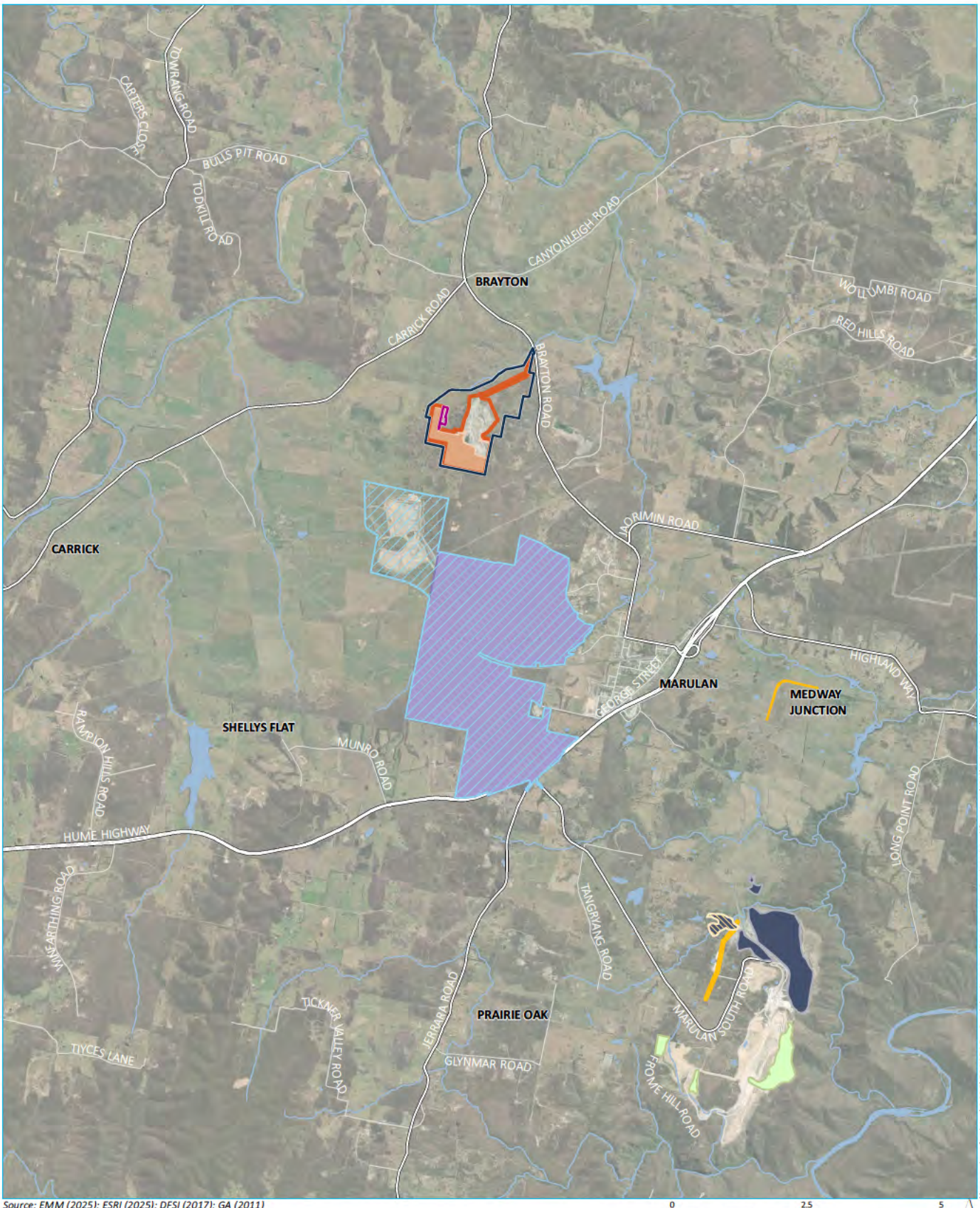
The search originally identified 94 registered Aboriginal heritage sites, objects and/or places within the general region. However, upon review of previous archaeological reports and projects in and around Gunlake Quarry, an additional 15 sites were identified, not appearing in the original search due to incorrect coordinates being entered, likely as a result of the modification project area's proximity to the border of zones 55 and 56 of the Universal Transverse Mercator system (UTM). Of these, 30 are registered as 'destroyed' with one considered as 'partially destroyed'. No sites have been restricted. A detailed breakdown of these 109 sites is provided in Table 5.1 and Figure 5.1.

The most commonly recorded site type in the area are stone artefact types (n=95, 87.16%) including either artefact scatters, isolated finds and/or undefined artefact sites. Many of these registered stone artefact sites do not specify the number of artefacts associated with the site (hence 'undefined") although inference from site names and site cards enables identification of some. Other sites represented across the landscape included culturally modified trees (n=7, 6.42%), stone arrangements (n=2, 1.83%), and potential archaeological deposits (n=5, 4.59%).

Two artefact scatters, GL14c (AHIMS ID#47-6-0789) and GL14a (AHIMS ID#47-6-0787) have been registered adjacent to, and extending into, the modification project area. Both are moderate density artefact scatters on a spur crest that have been at least partially salvaged (i.e. 'destroyed') by the development of the quarry extension.

Table 5.1 Summary of AHIMS site types within the search area

Site types	Count (n)	Percentage (%)
Stone artefact site	95	87.16
Undefined artefact site	22	20.18
Isolated find	38	34.86
High density artefact scatter (>50)	2	1.83
Moderate density artefact scatter (20-50)	4	3.67
Low density artefact scatter (<20)	29	26.61
Potential archaeological deposit (PAD)	5	4.59
Stone arrangement	2	1.83
Culturally modified tree (carved or scarred)	7	6.42
Total	**109**	**100**



KEY

- Modification project area
- Site boundary
- Continuation project disturbance area

Previous investigation

- EMM 2012
- EMM 2016, 2018
- ERM 2006
- ERM 2012
- RPS 2009
- Umwelt 2005, 2008, 2010
- Umwelt 2015

Existing environment

- Major road
- Minor road
- Named watercourse
- Waterbody

Previous investigations

Gunlake Quarry Continuation Project
Modification 3
Aboriginal Cultural Heritage Assessment
Figure 5.1

EMM
creating opportunities

5.5 Predictive model

On the basis of the archaeological sites registered in the region, a review of previous archaeological studies and the environmental context, the following conclusions can be drawn regarding the potential presence and location of Aboriginal sites within the modification project area:

- Artefact scatters and isolated finds are the most common sites within proximity to the modification project area, and can occur across most landforms, even in disturbed contexts. Open stone artefact sites are usually found close to streams on elevated, level to gently inclined landforms, such as hillcrests and hill spur crests, alluvial plains, and terraces. Subsurface archaeological deposits mostly occur on level to gently inclined landforms, such as hill crests and hill spur crests. To a lesser extent, archaeological deposits are found on foot slopes. However, the integrity and extent of the deposit is reliant on the condition and depths of soils. Where present, stone artefacts are most likely to reflect occupation over the last 5,000 years.

- Rock shelters and grinding grooves are unlikely to occur in the study area as the underlying ignimbrite geology is not conducive for these site types. Additionally, previous archaeological investigations and a search of the AHIMS database have shown a lack of these site types to be present.

- Culturally modified trees have not been previously recorded within and around the modification project area, despite the dense woodland surrounding Gunlake Quarry..

- The distance from any major water source makes it unlikely that shell middens will be present within the study area.

- Stone arrangements are most likely to occur on elevated and relatively flat landforms such as crests, terraces, or ridges, often near sources of outcropping cobbles or small boulders capable of being moved manually. Whilst the areas surrounding Goulburn and Marulan have areas of boulders and cobble outcrops, the lack of previously recorded sites of this type make it unlikely for this site type to occur within the modification project area.

- Burials can occur anywhere in the landscape, but their identification is rare. Generally, they would be identified by mounds of earth, carved trees, or stone markers. Burial sites have been historically and orally noted by RAPs in previous projects, but evidence of burials is generally rare because human bodies are susceptible to the generally acidic Australian environments and other taphonomic processes. The lack of soil deposit conducive for human burial and lack of burials recorded within the archaeological record in proximity to the modification project area makes it unlikely for this site type to occur.

6 Field investigation

6.1 Key findings

An archaeological field survey was undertaken on 30 September 2025. This investigation identified that no cultural materials relating to GL14c and GL14a were present on the surface, and the presence of exposed bedrock, particularly in areas of higher elevation, revealed only shallow soil profiles in the modification project area, especially along the western extent of the modification project area. Tall grass limited ground surface visibility, but no further cultural materials were identified.

A mature Stringybark eucalypt was identified by an Aboriginal participant as a potential ancestral tree site. While no cultural modifications were observed, the tree has been recorded as a cultural site. No other trees within the modification project area or its immediate surroundings exhibited cultural modifications.

Test excavation consisted of 18 test pits (0.25 m) in a grid with 20 m spacing, spread across the whole of the modification project area, with the exception of the future roadway portion connecting the southern end of the proposed emplacement extension area to the existing haul road. The survey team, in consultation with the RAPs on site, determined that this area was unlikely to retain evidence of cultural material due to the nature of the soil materials, and so excavation was not proposed in this locale. The depths of each pit ranged from 5–45 cm, with shallower soil profiles typically on high elevations and/or the western boundary. Deeper test pits were encountered downslope, although here to geological substrate was reached in under 50 cm. No cultural materials were encountered within the test excavations.

6.2 Archaeological survey

6.2.1 Approach and methods

The survey was undertaken on 30 September 2025, prior to the archaeological test excavation program, and aimed to:

- identify landforms that may have higher potential to contain Aboriginal cultural deposits
- identify evidence of previous disturbance that may have resulted in partial or complete removal of Aboriginal objects that may have been present
- identify and record any previously recorded or newly identified surface Aboriginal objects or sites present in the modification project area, as well as any cultural values associated with the site.

The focus of the archaeological field survey was to investigate soil exposures for extant Aboriginal objects and identify landforms that have potential for cultural material to be present (either in surface or subsurface deposits). All Aboriginal objects and/or landforms of interest were mapped and documented using handheld GPS, photographs, sketches and/or written descriptions.

A significant focus of the survey was to discuss intangible values associated with the modification project area, such as connection to other cultural places, stories, view lines, and contemporary values.

The archaeological field survey was undertaken in accordance with Requirements 5 to 10 of the Code of Practice (DECCW 2010b). In summary, the Code of Practice requires the following general methodology:

- Pedestrian survey of the modification project area.
- Recording of beginning and end points of transects or the boundaries of survey units, and the spacing between survey personnel.

- Recording of landform, soil information, land surface, vegetation conditions, visibility and exposure, and survey coverage.
- Recording of any identified Aboriginal sites according to Requirements 6¬8 and recording of any identified Aboriginal objects in accordance with Requirements 18¬24 of the Code of Practice. This would include the spatial location, photographs and sketches, and written description of any identified sites, such as culturally modified trees, artefact sites, etc.
- If any Aboriginal objects and/or sites are identified in the course of the survey, site cards will be completed and submitted to the AHIMS registrar.
- In the event of Aboriginal heritage being identified within the project footprint, discussions would be held on site to understand whether further investigation and/or management of these finds is warranted. Where sites are considered of high archaeological and/or cultural value, further characterisation, consideration of avoidance and re design would be explored with the registered Aboriginal parties. Appropriate mitigation measures would be developed in consultation with the Registered Aboriginal Parties and Heritage NSW for any potential unavoidable impacts.

The pedestrian survey was undertaken by Angus Lynch and Phillipa O'Brien-Pounde (EMM archaeologists) with representatives from the PLALC, Chris McAshter and Ashleigh Croker, as well as Dean Delponte (Table 6.1). Participants were spaced around 2–5 m apart and the team targeted ground exposures along transects. It must be noted, that archaeological surveys are inherently limited by ground surface visibility conditions and therefore any survey, despite the intensity of survey effort and spacing of survey transects, is considered to only sample the archaeological landscape. The team began in a northerly direction, hugging the eastern boundary, before turning around, now hugging the western boundary, before heading south into the south-east corner of the modification project area.

Table 6.1 Aboriginal representatives involved in the survey

Organisation	Representatives
Pejar Local Aboriginal Land Council	Chris McAshter Ashleigh Croker
Mundawari Heritage Consultants Pty Ltd	Dean Delponte

The effectiveness of the survey is determined through recording and analysing survey coverage data. It is evaluated for its effectiveness in identifying the distribution of Aboriginal objects across the landscape, taking into account the potential for archaeological deposits. The percentage of the ground surface exposed in each landform and the visible ground surface within exposures (as ground exposures are often obscured by vegetation, gravels, etc.) influences the survey results. For example, an archaeologically sensitive landform surface that is highly exposed by erosion is likely to reveal Aboriginal objects, whereas a similar landform that is thickly grassed will obscure surface artefacts if they are present. Overall, calculation of effective survey coverage is used to estimate not only how much area was physically surveyed, but also how favourable the survey conditions were for the identification of Aboriginal sites.

Site recording was completed in accordance with the Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW (DECCW 2010b). Survey transects were recorded as tracks on GPS units and detailed information about each transect recorded in field notebooks.

6.2.2 Results

The archaeological field survey included one survey unit (SU) across the entirety of the modification project area targeting the location of the proposed development footprint (Figure 6.1). The modification project area varies in elevation, with a gentle undulating hill occurring approximately 200 m from the southern boundary, and the aforementioned decrease in elevation in the modification project area's south-east corner, occurring at a steeper, yet still gentle, angle than the hill in the centre of the modification project area. The transects extended across the entirety of the modification project area, which is approximately 400 m long and up to 100 m wide. One pass was made hugging the eastern boundary, and another hugging the western boundary, before heading south into the south-east corner. Overall, the ground surface exposure was generally poor with average visibility of 10%, and an effective coverage of 2% (Table 6.2).

The survey unit did not focus on one specific area of the modification project area, as vegetation and visibility were relatively standard across the entirety of the modification project area. Some special consideration was made in the immediate areas around the two trees located in the modification project area where visibility was slightly better. There is no evidence of previous structures having been built on the land. Several steel star picket posts were noted, put there by Gunlake or a previous owner.

The modification project area appears to have been exposed to moderate–high levels of ground disturbance associated with historic farming practices. Water runoff from the Western Emplacement has revealed subsoils at the toe of the emplacement within the water management area for the emplacement. Outside of this area, visibility was extremely low (<20%), with the survey area covered in areas of tall grasses, with some cleared patches displaying evidence of wombat and rabbit activity, as well as numerous burrows spread across the modification project area. Mr Delponte noticed a plant nearby the modification project area had been torn up overnight, and attributed the damage to feral pigs, which may have also disturbed the modification project area.

The southern extent of the modification project area (corresponding to the narrow roadway) immediately adjacent to the exiting emplacement is used for vehicle access. The survey team, in consultation with the RAPs on site, determined that this southern area was unlikely to retain evidence of cultural material due to the nature of the soil materials, and so excavation was not proposed in this locale.

No Aboriginal objects were observed during the pedestrian survey. No trees were observed exhibiting cultural modifications, although [redacted] highlighted that the tree on the north-west boundary of the modification project area may have been an ancestral tree.

Table 6.2 Survey coverage

SU	Landform	Length (m)	Survey unit area (m^2)	Visibility (%)	Exposure (%)	Effective survey coverage area (m^2) (=survey unit area x visibility % x exposure %)	Effective coverage (%) (effective coverage area/survey unit area x 100)	Aboriginal sites identified
SU1	Plain	410	30,000	10	10	300	1	0



Plate 6.1 West view of emplacement on west border of the modification project area



Plate 6.2 Southern view of the modification project area, taken from the north boundary



Plate 6.3 Toe of the emplacement with subsoils exposed



Plate 6.4 View north of the modification project area, taken from the south boundary



Plate 6.5 View north adjacent to the emplacement — exposed topsoil within water management area



Plate 6.6 View east of the soils at the toe of the emplacement



Source: EMM (2025); ESRI (2025); DFSI (2017); GA (2011)

0 50 100 m

GDA 1994 MGA Zone 55

N

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Site boundary
Modification project area
Continuation project disturbance area
Field survey track

AHIMS
Isolated find
Open stone artefact
Aboriginal site area

Existing environment
Topographic contour (10 m interval)
Named watercourse

Proposed test excavation

Gunlake Quarry Continuation Project
Modification 3
Aboriginal Cultural Heritage Assessment
Figure 6.1

EMM
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6.2.3 Identified Aboriginal sites

During the field investigation, a mature Stringybark eucalypt located -in the centre of the northern end of the modification project area was identified by an Aboriginal participant as a potential ancestral tree based on the cultural and ecological values associated with this tree species (Figure 6.2 and Plate 6.7). Although no visible cultural modifications were exhibited on the tree, and previous investigations of the site failed to identify this feature, it has nonetheless been identified as a cultural site in this report (classified as 'GL-AT1').

No additional cultural materials or areas of subsurface potential were identified during the survey works. No surface cultural materials associated with sites GL14c or GL14a were observed or encountered within the modification project area.



Plate 6.7 **Potential ancestral tree (GL-AT1) identified by an Aboriginal participant. View south-west.**

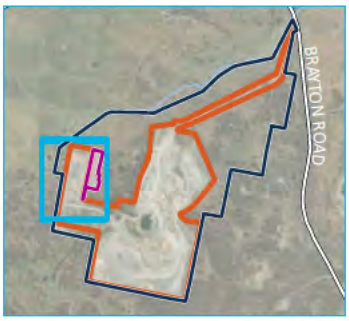


Source: EMM (2025); ESRI (2025); DFSI (2017); GA (2011)

0 50 100 m

GDA 1994 MGA Zone 55

N



Site boundary
Modification project area
Continuation project disturbance area
Field survey track

AHIMS
Isolated find
Open stone artefact
Gunlake quarry ancestral tree
Aboriginal site area

Existing environment
Topographic contour (10 m interval)
Named watercourse

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Identified Aboriginal sites

Gunlake Quarry Continuation Project
Modification 3
Aboriginal Cultural Heritage Assessment
Figure 6.2

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6.3 Test excavation

6.3.1 Approach and methods

The findings of the desktop review and the field survey indicated that there was moderate potential for buried soil profiles of archaeological interest to be present with the modification project area. Whilst moderate–high disturbance has occurred over the modification project area, records of high-density archaeological finds in the surrounding areas increased the chances of cultural material being present in this site. The previous use of the land however, made it unclear how much of the Aboriginal landscape would be present and, if present, whether such activities had truncated the natural soil profile, and in so doing removed any cultural materials that are typically constrained to the upper portion of such deposits. Given this uncertainty, an archaeological test excavation was proposed to investigate the modification project area, allow characterisation of the soil profile, and determine whether cultural materials are present.

These works were undertaken in accordance with the *Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010) and consisted of small manually dug test pits in across the modification project area. The excavation was directed by Courtney Culley (EMM archaeologist), with the archaeological team consisting of Miles Robson and Joel Mason (EMM archaeologists). Aboriginal organisations represented during the test excavation are listed in Table 6.3.

Table 6.3 Aboriginal representatives involved in the test excavation

Organisation	Representatives
Pejar Local Aboriginal Land Council	Chris McAshter (30/9/25) Ashleigh Croker (30/9/25) Lawrence Seymour (1/10/25) Rodney Seymour (1/10/25)
Mundawari Heritage Consultants Pty Ltd	Dean Delponte (30/9/25–1/10/25)

The primary aims of the excavations were to:

- identify, map and characterise the nature, age, extent, integrity and significance of any Aboriginal cultural material within the impact areas
- better assess the significance and historical meaning of any cultural material that may exist within the modification project area so that future archaeological investigation can advance our understanding of past Aboriginal cultural behaviour and environmental adaptation
- direct future heritage activities and mitigation measures (if required) for the modification project area.

During the survey, no key areas of archaeological potential were observed, and 18 test pits spaced ~20 m apart upon a grid formation was utilised to address the primary aims of the excavation. The following methods were adopted for the excavation:

- All test excavation pits were spatially located using a differential GPS device (Trimble).
- Manual excavation of 0.25 m² (50 x 50 cm) test pits in a systematic grid across areas of archaeological interest within the impact footprint. The spatial resolution of the grid was dependent on on-ground conditions but test pits were typically between 20 m apart.

- Excavation used hand tools. Excavation of the first unit was in 5 cm spits, with subsequent excavation allowed in 10 cm spits or according to stratigraphy (whichever was smallest) depending on the results of the first unit. Manual excavation continued to either i) the base of the cultural deposits; ii) to the depth of the underlying geology; or iii) to the maximum depth possible via hand excavation.

- All manually excavated material was dry sieved through a 5 mm sieve. Soil profiles were recorded in accordance with the Code of Practice, including scaled drawings, photographs, and written descriptions.

6.4 Results

A total of 18 test pits were excavated, with the excavated sediment recovered and dry sieved through a 5 mm mesh (Table 6.4, Figure 6.3). Test pits averaged depths of ~22 cm below ground surface, and extending to 45 cm depth below ground surface. Two pits reached only 5 cm below ground surface before encountering sandstone boulders. No planned test pits were required to be repositioned.

The archaeological test excavation revealed that the site is located on a duplex soil landscape with variations in intact topsoil. The depth of the soils was shallower across the western portion of the modification project area that was closer to the existing emplacement and at a higher elevation than the western portion. In these areas, shallow (<10 cm) dark brown silty clay deposits sat disconformably on sandstone or light to medium clay. The shallower depths of the test pits near the emplacement may reflect erosion as a result of water runoff from the emplacement within the water management area, and TP1 becoming waterlogged during excavation. The greater depth of test pits at lower elevations may be the result of colluvial processes resulting in soil from upslope accumulating at the base of the slopes. TP15, TP16, and TP18 were all located in this area, and all excavated to ~40 cm, some 10–20 cm deeper than surrounding test pits.

The remainder of the test pits varied from 10–30 cm in depth and were stopped when geological substrate (either sandstone or clay) was encountered. An A2 horizon was intermittently encountered – a sandy clay loam often occurring between the topsoil and the clay, sometimes with sandstone inclusions interspersed within.

No historical material was encountered during the test excavation program.

Generally, the soil profile observed across the modification project area consisted of the following units:

1. Dark brown silty clay loam (A1 unit): a firm dark brown silty clay loam with gravel inclusions occurring in test pits at higher elevations, or on the western boundary, close to the emplacement. Small roots from surface level grasses rarely extended deeper than ~7 cm.

2. Pale sandy clay loam (A2 unit): a grey-yellow sandy clay loam that occurred in test pits deeper than 15 cm, ranging from moist to moderately moist, featuring gravel inclusions.

3. Grey light sandy clay (B2 unit): a light sandy clay that had hardened on its outer layer, gaining plasticity and moisture when excavated. Firm-strong in density, numerous test pits were stopped when reaching this level due to its toughness.

4. Light clay with sandstone inclusions (B/C unit): often occurring 5–10 cm before encountering sandstone boulders, this clay possessed similar features to the grey light sandy clay yet was slightly softer. Sandstone inclusions ranged from gravel-sized (2–20 mm) to cobbles (60–200 mm).

5. Sandstone boulders (C unit): numerous test pits encountered sandstone at depths as shallow as 5 cm, particularly close to the soil mound on the western boundary or at higher elevations. The sandstone had an orange exterior and a pale-yellow interior and varied in size yet often covered the base of the test pits.

No cultural materials were recovered from the test excavations. The lack of cultural material in every test pit meant that no test pit was considered for expansion or higher grid resolution.

Table 6.4 Summary of the test excavation results

Test Pit	Easting	Northing	Area of excavation (m^2)	Depth excavated (cm)	Current ground surface (m AHD)	Final depth of excavation (m AHD)	Number of artefacts	Artefacts per m^2
TP1	771252	6159380	0.25	45	669.35	668.89	0	0
TP2	771262	6159416	0.25	10	669.28	669.15	0	0
TP3	771272	6159454	0.25	30	669.40	669.18	0	0
TP4	771278	6159497	0.25	10	668.81	668.74	0	0
TP5	771285	6159536	0.25	20	666.93	666.77	0	0
TP6	771295	6159575	0.25	20	667.27	667.18	0	0
TP7	771302	6159615	0.25	25	666.25	666.07	0	0
TP8	771312	6159654	0.25	15	665.53	665.40	0	0
TP9	771347	6159647	0.25	25	668.22	668.11	0	0
TP10	771339	6159604	0.25	5	668.27	667.96	0	0
TP11	771331	6159569	0.25	10	669.03	669.02	0	0
TP12	771326	6159528	0.25	5	668.63	668.57	0	0
TP13	771318	6159493	0.25	25	667.03	666.81	0	0
TP14	771309	6159448	0.25	15	666.98	666.86	0	0
TP15	771300	6159408	0.25	40	666.61	666.24	0	0
TP16	771291	6159370	0.25	45	666.40	666.07	0	0
TP17	771331	6159361	0.25	10	663.68	663.64	0	0
TP18	771341	6159397	0.25	15	663.69	663.28	0	0
Average	-	-	**0.25**	**22.22**	-	-	**0**	**0**
Total	-	-	**4.5**	**400**	-	-	**0**	**0**



Plate 6.8 North facing location of TP2



Plate 6.9 North profile of TP2 showing sandstone at shallow depths



Plate 6.10 North profile of TP1 showing sandstone inclusions in clay at approximately 30 cm



Plate 6.11 North profile of TP4 showing sharp transition from topsoil to sandstone



Plate 6.12 Dry hard pale clay on the base of TP6



Plate 6.13 North profile of TP18 showing depth of diffuse alluvial stratigraphy onto clay with sandstone inclusions

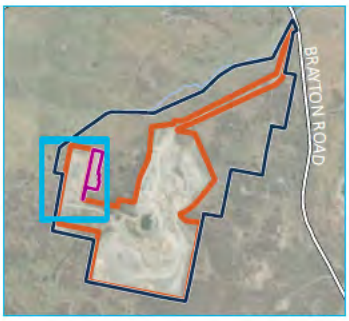


Source: EMM (2025); ESRI (2025); DFSI (2017); GA (2011)

0 50 100 m

GDA 1994 MGA Zone 55

N



Site boundary
Modification project area
Continuation project disturbance area

Artefact count
0

AHIMS site type
Isolated find
Open stone artefact
Aboriginal site area

Existing environment
Major road (see inset)
Topographic contour (10 m interval)
Named watercourse

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Test excavation results

Gunlake Quarry Continuation Project
Modification 3
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Figure 6.3

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7 The archaeological resource

Past archaeological studies and previously documented Aboriginal heritage in the area show that material culture within the regional context is generally dominated by artefact scatters and isolated finds, usually located near major sources of water, or on elevated positions with clear lines of view. Closer to the modification project area, artefactual sites, commonly isolated objects and low density (<10) occurrences are documented as surface finds throughout the area. These cultural materials indicate use of the landscape between water sources such as the Wollondilly River, Chapmans Creek, and Shoalhaven River. Furthermore, evidence suggests that the regional surroundings of the modification project area were once a meeting place used by the Ngunawal, Yuin, and Gundungurra peoples, likely influencing the cultural material found in the modification project areas vicinity.

Other site types such as stone arrangements, culturally modified trees and ceremonial and natural places of cultural importance are commonly found located in close proximity to permanent water sources in the surrounding landscape. These cultural materials indicate use of water sources in the vicinity, such as the aforementioned Wollondilly River, by Aboriginal people. Culturally modified trees are generally only found in areas where remnant vegetation has survived. Neither of these site types are present or expected in the area based on field investigations and consultation with the local Aboriginal community, aside from the singular possible example of an ancestral tree.

Spatially, the largest concentrations of registered sites in the regional context occur to the west of Marulan, nearby Lynwood Quarry and Brayton Park. The lack of registered sites in areas aside from Lynwood Quarry suggests that the majority of sites have been recorded as part of Aboriginal heritage assessments and are therefore not an entirely accurate indicator of past habitation and confluence zones. The AHIMS data does show a small density of artefacts following Jaorimin Creek, highlighting the increased likelihood of encountering cultural material nearby permanent or relatively reliable water sources.

Past land use and historical activities across the site are relatively limited, with pastoral activities largely being replaced by quarrying, with no existing or past historical structures having ever existed on the site. Ignimbrite inclusions were found to be much more common in both topsoil and subsoil on the western boundary as a result of the emplacement, and the increased water runoff may have been a contributing factor in the relatively shallower test pits that were excavated on the western boundary. Additional ground disturbance was noted as a result of local fauna, such as snakes, pigs, rabbits, wallabies, kangaroos, and wombats.

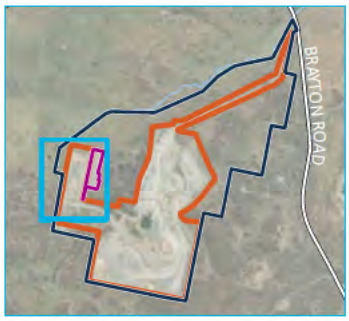
Archaeological field survey and subsequent test excavations revealed no cultural heritage material present within the modification project area. This included validation that previously documented sites, GL14c (#47-6-0789) and GL14a (#47-6-0787), are no longer present within the modification project area. The sparseness of cultural materials could be related to several factors, including past pastoral use, vegetation clearance and erosion as a result of natural processes, and the distance from a reliable source of water. Additionally, the modification project area is not located on a landform commonly associated with cultural materials, such as a ridgeline or prominent hill top. Other key environmental indicates, steep relief and remnant vegetation are also absent limiting the potential for well documented sites in the region like rockshelters and culturally modified trees. Furthermore, GL14c and GL14a were subject to surface collection as part of the project's post-approval mitigation measures, and that any artefacts, if they were present, may have been recovered during these activities.

Based on the on-Country activities, it is considered that the modification project area has a low likelihood of tangible cultural materials being present. Discussions with RAPs have not identified any regional cultural places, stories or sites that would be affected by the project. However, an unmodified stringybark eucalypt tree was identified, GL-AT1, by Aboriginal participants as having cultural value, and has been identified for further management.



Source: EMM (2025); ESRI (2025); DFSI (2017); GA (2011)

0 50 100 m
GDA 1994 MGA Zone 55
N



KEY

- Site boundary
- Modification project area
- Continuation project disturbance area
- Gunlake quarry ancestral tree
- Field survey track

AHIMS record

- Isolated find
- Open stone artefact
- Aboriginal site area

Existing environment

- Topographic contour (10 m interval)
- Named watercourse

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The archaeological resource

Gunlake Quarry Continuation Project
Modification 3
Aboriginal Cultural Heritage Assessment
Figure 7.1

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8 Significance assessment

8.1 General

All Aboriginal objects in NSW are protected under the *National Parks and Wildlife Act 1974* (NPW Act). It is recognised that the impact or destruction of sites may be necessary to allow other activities or developments to occur. In order for the consent authority to make informed decisions on such matters, an important element of cultural resource management is determining the significance of cultural heritage places and objects to understand what may be lost; and how best it can be avoided or mitigated. However, it is highlighted that something can be of little or no significance and still be protected under the NPW Act.

Cultural significance is outlined in Article 1.2 of the *Burra Charter* - the best practise document for managing cultural heritage – as 'aesthetic, historic, scientific, social or spiritual value for past, present or future generations' (ICOMOS (Australia), 2013). These values are reiterated in the NSW guidelines, which determines cultural significance of a place can be assessed by identifying the values that are present across the project site and assessing what is important and why (OEH 2011). In assessing the scientific significance of sites, aspects such as rarity and representativeness and the integrity must be considered. Generally speaking, a site or object that is rare will have a heightened significance, although a site that is suitable of conservation as 'representative' of its type will also be significant. Conversely an extremely rare site may no longer be significant if its integrity has been sufficiently compromised.

The criteria adopted for this report are defined in Table 8.1. The management implications of these sites' significance are discussed in subsequent sections.

Table 8.1 A summary of criteria used to assess the cultural significance (OEH 2011:8–10)

Criterion	Definition
Social value—Does the place have a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons?	Social (or cultural) value refers to the spiritual, traditional, historical or contemporary associations and attachments the place or area has for Aboriginal people. Social or cultural value is how people express their connection with a place and the meaning that place has for them. Social or cultural value can only be identified through consultation with Aboriginal people.
Historic value—Is the place important to the cultural or natural history of the local area and/or region and/or state?	Historic value refers to the association of a place with a historically important person, event, phase or activity. Historic places do not always have physical evidence of their historical importance (such as structures, planted vegetation or landscape modifications). They may have 'shared' historic values with other (non-Aboriginal) communities.
Scientific (archaeological) value—Does the place have potential to yield information that will contribute to an understanding of the cultural or natural history of the local area and/or region and/or state?	Scientific (archaeological) value refers to the importance of a landscape, area, place or object because of its rarity, representativeness and the extent to which it may contribute to further understanding and information. Information about scientific values is gathered through archaeological investigation undertaken in this report.
Aesthetic value—Is the place important in demonstrating aesthetic characteristics in the local, regional, and/or State environment?	Aesthetic value refers to the sensory, scenic, architectural and creative aspects of the place. It is often linked with social value, and can consider form, scale, colour, texture and material of the fabric or landscape, and the smell and sounds associated with the place and its use. This value is only relevant to archaeological sites on only rare occasions, such as rockshelters that contain art, or culturally modified trees in prominent positions, etc.

8.2 Statement of significance

The modification project area encompasses one Aboriginal site (Table 8.2 and Figure 7.1). This is an unmodified Stringybark eucalypt, GL-AT1, that was identified to have cultural values by one of the Aboriginal participants. Scientifically, this site has no values, being an unmodified tree with no evidence of modification or past use. Indeed, while natural growth phenomena such as signal and ring trees are increasingly presented as reflecting past activity, there is no anthropological or historical evidence of such features; and they reflect a contemporary perception of the cultural landscape by Aboriginal people (Morris et al. 2025). As such, the values of this site are entirely based on the views and perspectives of the Aboriginal participants. In this instance, a single participant identified the site as of significant to them and their community, and the significance of the site is based on this individual perspective.

Table 8.2 Significance of Aboriginal objects and/or sites identified within the modification project area.

Site	AHIMS #	Site type	Brief description	Site status	Significance				
					Scientific	Aesthetic	Historical	Cultural	Overall
GL-AT1	51-6-1011	Cultural place	Unmodified Stringybark eucalypt with cultural value	Valid	-	-	-	Low	Low

Notes: 1. Values are only assigned where the site fulfils that specific criterion.

2. In the case of the cultural criterion, it is ranked in relation to whether the site is important to one individual (low), a mixed view from the Aboriginal participants (moderate) or broad-scale support from all stakeholders (high).

3.The overall significance is comparable with the highest ranking achieved in any of the four main criteria.

9 Impact assessment

9.1 Key findings

It is proposed to expand the Western Emplacement. This would involve vegetation clearance and bulk earthworks.

The investigations identified no tangible cultural materials within the modification project area, and demonstrated that two previously documented sites, GL14c (#47-6-0789) and GL14a (#47-6-0787), have been mitigated as part of earlier phases of the quarry. A single cultural site, an unmodified Stringybark eucalypt, is within the modification project area and would be directly and completed impacted by the proposed development activities.

Given the potential impacts to a tree of cultural importance to the local Aboriginal community, mitigation measures are proposed to preserve the felled tree and place outside of the disturbance area. This would have minor potential cumulative impacts to the regional cultural assemblage.

9.2 Project impacts

As outlined in Section 1.2.1, the proposal seeks the expansion of the Western Emplacement, which forms a modification to the Gunlake Continuation Project (MOD 3). The project will involve the removal of vegetation from the modification project area and placement of overburden and waste rock in this area. As such, these activities would result in complete disturbance of the component of the soil profile within which cultural materials would occur if present. These activities can cause compaction and downward movement of the upper portions of the soil profile, which may affect cultural material, if present.

9.3 Potential Aboriginal heritage impact

Two types of potential impact are considered, direct and indirect. Direct impacts relate to the construction activities and their removal, truncation and/or disturbance of the ground surface. This would include the removal of vegetation, removal or modification of geological outcropping and the removal or disturbance of the upper soil profile. Indirect impacts are the result of both construction and post-construction activities that may result in environmental changes that would affect cultural material within, or near the project activities. General examples of indirect impact may include the burial of a soil profile resulting in its compression and indirectly damaging buried cultural material, or an increase in dust being blown into a rock shelter and negatively affecting art motifs should they be present.

Given the proposed level of vegetation and ground disturbance, it is considered that any cultural materials present would be directly and completely impacted within the modification project area.

Only one site was identified within the modification project area, an unmodified Stringybark eucalypt identified as having cultural value to the local Aboriginal community. This tree is situated within the centre of the modification project area, and in situ avoidance is unfeasible. As such, this site would be destroyed by the proposed activities (Table 9.1).

Two documented sites, GL14c (#47-6-0789) and GL14a (#47-6-0787), previously identified within the modification project area have been mitigated as part of earlier phases of the quarry operations. As such, these sites would be unaffected by the proposed modification. No further cultural materials were observed or documented within the modification project area.

Table 9.1 Summary of potential impacts to Aboriginal sites and objects

AHIMS #	Site name	Overall significance	Type of harm	Location and/or activity causing harm	Degree of harm	Consequence of harm
51-6-1011	GL-AT1	Low	Direct	Within the development footprint	Complete	Complete loss of value

Notes: The type, degree and consequence of harm definitions are based on DECCW's *Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW*.

9.4 Inter-generational equity

Intergenerational equity is the principle whereby the current generation should ensure the health, diversity and longevity of the environment for the benefit of future society. For Aboriginal heritage management, intergenerational equity can be considered primarily in terms of the cumulative impacts to Aboriginal objects, sites and/or places in a region. If few Aboriginal objects and places remain in a region (e.g. due to development impacts), there are fewer opportunities for future generations of Aboriginal people and the broader community to enjoy the cultural benefits. Information about the integrity, rarity and representatives of the Aboriginal objects, sites and places that may be impacted, and how they inform the past visitation and occupation of land by Aboriginal people, are relevant to the consideration of intergenerational equity and the understanding of the cumulative impacts of a project.

Overall, the project would impact a single cultural site, GL-AT1 (Sections 7 and 9.3), an unmodified Stringybark eucalypt that is identified as of cultural value to the local Aboriginal community. The site has no scientific value and is considered to reflect a site of contemporary importance to the Ngunawal traditional owners. Given there are few cultural sites documented in the broader region, impacts to this site may result in some cumulative impact to the regional cultural assemblage. However, it must be noted that cultural values mapping and investigations are sparse in this part of NSW. As such a comprehensive record of intangible and cultural places, stories and sites are poorly understood across the region currently. The presence of such sites may therefore be more common that is currently understood, with numerous patches of remnant and established vegetation across the Marulan region.

Expansion of the Western Emplacement is constrained to the north, south and west is constrained by the site boundary. There is limited scope to entirely avoid impacts to GL-AT1 which is close to the current emplacement, in the centre of the northern end of the modification project area. As such, management measures are proposed to mitigate impacts to GL-AT1 (see Section 10.2).

10 Conclusions and recommendations

10.1 Key findings

This ACHA addendum concludes the one cultural site is situated within the modification project area, an unmodified Stringybark eucalypt that the local Aboriginal community considered to have cultural values. The tree is situated within the centre of the modification project area, and would need to be removed as part of the modification activities.

No further cultural materials were encountered within the modification project area, including validation that two previously documented sites have been mitigated and are no longer present.

Recommendations are proposed to manage Aboriginal heritage (Section 10.3). These include the need to update existing databases in relation to previously documented sites that have been salvaged and/destroyed, and integration of the modification project area into the existing Gunlake Quarry Continuation Project ACHMP.

10.2 Management strategy

10.2.1 Summary of findings

The Gunlake Quarry site and its immediate environs have been subjected to extensive archaeological investigation, and the archaeological and cultural resource of the region is well understood. Regionally, archaeological models stress the importance of flat and elevated terraces, ridge spurs and hills in close proximity to the region's major watercourses, where predominantly stone artefact sites of varying densities can be expected.

The quarry site conforms well to this regional archaeological model. Previous investigation spanning back to 2008 has resulted in the identification of 18 Aboriginal sites within the Gunlake Quarry site, and of these, two artefact scatter sites, GL14c (#47-6-0789) and GL14a (#47-6-0787) have been recorded to extend into the modification project area. However, due to a myriad of factors relating to historical disturbances, erosion and anthropogenic processes, neither site remains extant within the modification project area. From a cultural heritage management perspective, both GL14c and GL14a have already been subjected to cultural salvage as part of an earlier phase of work, and both sites have been designated as being 'partially destroyed' on the AHIMS database, and within the existing Gunlake Quarry ACHMP (Gunlake 2025). Since these databases (and associated documentation) provide legislative protection to cultural material and guide future investigations of the site, both the ACHMP and AHIMS database should be updated to document the findings of this report – resulting in revisions to the site boundaries to reflect that GL14c and GL14a do not extend into the modification project area, and that both sites can be considered 'destroyed' for cultural heritage management purposes.

While further stone artefactual material was not encountered during on-Country activities, an unmodified Stringybark eucalypt was identified as having cultural values by one of the Aboriginal participants. This tree was subsequently documented as a cultural site, GL-AT1, and is considered to be of low significance. This value relating to the lack of broader inputs from the local Aboriginal community, and the absence of scientific significance, such sites having little anthropological or historical basis. The tree would be removed as part of the proposed modification as it is situated in the centre of the proposed emplacement area extension.

10.2.2 Management

The Continuation Project SSD approval (SSD-12469087) contains conditions to manage identified impacts to Aboriginal heritage, primarily the preparation of an ACHMP, to allow harm to proceed.

Gunlake Quarry Continuation Project has an existing ACHMP, which provides guiding principles and a framework for the identification, assessment and management of cultural heritage for all of its quarrying operations. It provides a structured approach to managing cultural heritage, including consultation with the Aboriginal community, mitigation approaches and methods, and unexpected discoveries of cultural material, during construction activities and for the life of the project.

10.3 Recommendations

In addition to established processes for management of unexpected finds and/or ancestral remains within the ACHMP, it is also recommended that approaches and methods to the management of GL-AT1 are developed.

Some directions have already been sought from Aboriginal participants and outlined in Section 2.4, as the removal of the tree cannot be avoided as part of the proposed modification, careful recovery and relocation of the timber on Country is recommended. The detailed actions would be provided in the ACHMP.

It is recommended that:

1. Management of the modification project area is integrated into the Gunlake Quarry Continuation Project ACHMP, which has established processes for Aboriginal consultation, mitigation approaches and methods, and protocols for unexpected finds and ancestral remains. The ACHMP should be updated to:

    a) provide suitable approaches and methods for the relocation and long-term management of GL-AT1, determined in consultation with representatives of as Mundawari Heritage Consultants Pty Ltd

    b) specify that there are no anticipated impacts to GL14c and GL14a resulting from the proposed modification project, and the proposed modification is considered to have low risk of harming Aboriginal objects.

2. Where the heritage consultant changes through the project, suitable hand over should be undertaken to ensure no loss or mistranslation of the intent of the information, findings and future steps in heritage management occur.

3. A final copy of the ACHA should be provided to the RAP groups for their records.

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Abbreviations

Abbreviation	Definition
AHD	Australian Height Datum
ACHA/ACHAR	Aboriginal cultural heritage assessment report
AHIMS	Aboriginal Heritage Information Management System
ACHMP	Aboriginal Cultural Heritage Management Plan
BP	Years before present
c.	circa
cm	centimetres
DA	Development application
DEC	Department of Environment and Conservation, now Heritage NSW
DECCW	Department of Environment, Climate Change and Water, now Heritage NSW
DPC	Department of Premier and Cabinet
DPE	Department of Planning and Environment, now DPIE
DPIE	Department of Planning, Industry and Environment
EIS	Environmental Impact Statement
EMM	EMM Consulting Pty Ltd
EP&A Act	*Environmental Planning and Assessment Act 1979*
ESD	Ecologically sustainable development
FGS	Fine grained siliceous
g	grams
GIS	Geographical information system
GPS	Global positioning system
ha	hectares
ICOMOS	International Council on Monuments and Sites
IMTC	Indurated mudstone/tuff/chert
km	kilometres
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
m	metre
m^2	square metres
mm	millimetres
n	number

Abbreviation	Definition
NSW	New South Wales
NTSCORP Limited	Native Title Services Corporation Limited
OEH	Office of Environment and Heritage, now Heritage NSW
ORALRA	The Office of the Registrar, *Aboriginal Land Rights Act 1983*
PAD	Potential archaeological deposit
RAP	Registered Aboriginal Part
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SSD	State Significant Development
t	tonne
tpa	Tonnes per annum
TP	Test pit
WSC Quarries	Western Suburbs Concrete Quarries Pty Ltd

Glossary

Many of these definitions have been taken from the *Code of Practice for archaeological investigation of Aboriginal objects in NSW* (DECCW 2010).

Aboriginal object: A physical manifestation of past Aboriginal activity. The legal term is defined in the *National Parks and Wildlife Act 1974* section 5 as: any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains.

Typical examples include stone artefacts, grinding grooves, Aboriginal rock shelters which by definition include physical evidence of occupation, midden shell, hearths, stone arrangements and other landscape features which derive from past Aboriginal activity.

Archaeological survey: A method of data collection for Aboriginal heritage assessment. It involved a survey team walking over the land in a systematic way, recording information. Activities are not invasive or destructive.

Aboriginal culturally modified tree: A tree of sufficient age to have been mature at the time of traditional Aboriginal hunter-gatherer life and therefore generally of more than 220 years ago with evidence of bark or cambium wood removal for the purpose of implement manufacture, footholds, bark sheet removal for shelter, or extraction of animals or other food. Care must be taken to distinguish Aboriginal scars from the much more common natural causes of branch tear, insect attack, animal impact, lightning strike and dieback. Culturally modified tree recognition guidelines exist to distinguish these features. Naturally scarred trees are often misidentified as Aboriginal culturally modified trees.

Aboriginal site: The location where a person in the present day can observe one or more Aboriginal objects. The boundaries of a site are limited to the extent of the observed evidence. In the context of this report a 'site' does not include the assumed extent of unobserved Aboriginal objects (such as archaeological deposit). Different archaeologists can have varying definitions of a 'site' and may use the term to reflect the assumed extent of past Aboriginal activity beyond visible Aboriginal objects. Such use of the term risks defining all of Australia as a single 'site'.

Aboriginal stone artefact: A stone object with morphological features derived from past Aboriginal activity such as intentional fracture, abrasion or impact. Artefacts are distinguished by morphology and context. Typically flaked stone artefacts are distinguished from naturally broken stone by recognition of clear marginal fracture initiation (typically herzian/conchoidal or wedging initiation) on highly siliceous stone types which can often be exotic to the area. Care must be taken to distinguish modern broken stone in machine impacted contexts and therefore context must be carefully considered as well as morphology.

Aggradation: a term used in geology for the increase in land elevation, typically in a river system, due to the deposition of sediment.

AHIMS: Aboriginal Heritage Information Management System — a computer software system employed by the Office of Environment and Heritage to manage many aspects of Aboriginal site recording and permitting. AHIMS includes an Aboriginal sites database which can be accessed via an internet portal.

Archaeological deposit: Aboriginal objects occurring in one or more soil strata. The most common form of archaeological deposit relates to the presence of a single conflated layer of Aboriginal stone artefacts worked into the topsoil through **bioturbation**.

Backed artefact: A thin flake or blade-flake that has been shaped by secondary flaking (**retouch**) along one lateral margin. The retouched margin is typically steep and bipolar to form a blunt 'back' in the manner of a modern scalpel blade. Distinctive symmetrical and asymmetrical forms are typically found called geometric **microliths** and Bondi points respectively. A thick symmetrical form, called an Elouera, is typically the size of a mandarin segment.

Bioturbation: is the reworking of soils and sediments by animals or plants. Its effects include changing texture of sediments (diagenetic), bioirrigation and displacement of microorganisms and non-living particles.

Bipolar flaking: Where the stone to be worked is rested on an anvil or other stone before being hit by the hammerstone. This results in the presence of negative flake scars on both ends of the core.

Bondi point: See backed artefact definition.

Brown podosols: Topsoils have loamy textures. A2 horizons are common, there is a clear boundary onto the B horizon. They have a sandy clay to heavy clay texture (typically occur on upper and mid-slopes).

Chocolate Soils: Soils that are typically formed in a basaltic parent material where slope or bedrock strata influence drainage. Surface horizons comprise loam, clay loam or silty clay loam. There is a gradual boundary to a brown or brownish black B horizon. There is no A2 horizons.

Conchoidal: A term used in relation to fracture surfaces on Aboriginal stone artefacts - bulb-like in the manner of a bulbous protrusion on a bivalve shell.

Elouera: See backed artefact definition.

Eraillure scar: The small flake scar on the dorsal side of a flake next to the platform. It is the result of rebounding force during percussion flaking.

Exposure: estimates the area with a likelihood of revealing buried artefacts or deposits, not just an observation of the amount of bare ground.

Geometric microlith: See backed artefact definition.

Grinding grooves: Grinding grooves typically derive from the sharpening of stone hatchet heads on sandstone rock. Grooves appear as elliptical depressions of around 25 cm length with smooth bases. Although mostly occurring in association with water to wash the abraded stone dust away from the groove, such sites have been recorded away from water. Narrow grooves or broad abraded areas may occur less commonly and may be derived from spear sharpening or other grinding activities.

Haematite: a pigment featured in ochre used for tinting with a permanent colour.

Holocene: A period of time generally 10,000 years, which marks the end of the last ice age, to the present.

Igneous: relating to or involving volcanic or plutonic processes.

Indurated mudstone/tuff (IMT): the fine textured, very hard, yellowish, orange, reddish-brown or grey rocks from which stone artefacts are made.

Isotropic: Having a physical property that has the same value when measured in different directions. In relation to stone used for stone tools a fracture path is not hindered by layer boundaries or other favoured plane of cleavage.

Microlith: Very small fragments of flakes retouched into geometric shapes and usually present on tools like barbed spears, arrows and sickles.

Midden: A collection of shells and associated economic remains resulting from Aboriginal food gathering and processing activity. Middens comprise shellfish remains of consistent size in a rich dark earth matrix commonly associated with stone artefacts, fish bone and animal bone although shells are commonly the most obtrusive element.

Keeping place: A room or facility with the express and exclusive purpose of storing Aboriginal cultural heritage materials with accompanying documentation in a secure and accessible manner which protects their cultural heritage values.

Krasnozems: Mainly loams, clay loams and silty clay loams with a clear or gradual boundary to a dark reddish brown B horizon. Clays are typically light to medium and occasionally heavy.

Lithosols: Soils that have little or no profile development. They occur on steep slopes and are usually shallow and are left mainly as uncleared native bushland.

Open stone artefact site/stone artefact site: An unenclosed area where Aboriginal stone artefacts occur – typically exposed from a topsoil archaeological deposit by erosion. Typically the term is used to refer to two or more artefacts although this is an arbitrary distinction. A general 'rule of thumb' boundary definition employed by archaeologists is that artefacts or features more than 50 m apart are regarded as separate sites, however there is no theoretical imperative dictating such as rule. (The 50 m separation rule is used for the most part in EMM's work).

Pirri point: A leaf-shaped stone implement with unifacial retouch extending from the lateral margins to a central keel running the length of the dorsal surface.

Pleistocene: A period of time 2.6 million years ago to 10,000 years ago. Reference to 'Pleistocene sites' generally means reference to sites older than 10,000 years.

Podosols: Soils with accumulations of organic matter, iron and aluminium. They are usually sand textured to depth. Yellow and red podosols are generally acid neutral. Yellow podosols have coarse to medium textured A horizons.

Point cluster: A group of GPS points used to identify the locations of individual artefacts in the field.

Potential Archaeological Deposit (PAD): An area where there is an inferred presence of Aboriginal objects in the soil based on the environmental context which is typically associated with discovery of Aboriginal objects in analogous areas. This is not strictly a 'site' type, although AHIMS records it as such for the purpose of associating Aboriginal heritage Impact Permits with geographical areas.

Red podosols: Podsols with a pronounced texture contrast and clear to abrupt boundaries between A and B horizons. A2 is often massive and gravelly.

Retouch: The modification of the edges of a flake or tool by the removal of a series of small flakes.

Siliceous Sands: Sands that are usually found on coarse-grained sandstones and in sandstone colluvium. They are often sandstone outcrops present in the landscape. The topsoil has a loamy sand to light sandy clay.

Scarp: a steep slope characterised by outcropping bedrock. In this report, scarp refers to a combination of landform elements including scarp foot slopes, scarps, and cliff lines where outcropping sandstone is present in the landscape 10% and above.

Spur: the lateral crests of land that descend from the summit of hills or ridges. Spurs typically extend, with decreasing elevation, closer to streams and valley floors than the main crest of a hill.

Taphonomic: the events and processes, such as burial in sediment, leading to the degradation, decomposition or preservation of objects.

Thumbnail scraper: A thumbnail sized thin flake with steep unidirectional retouch or use-wear around a convex working edge.

Transect: A sample unit which is walking line or corridor across the study area.

Upsidence: phenomena that occurs when mining approaches and undermines river valleys. It can result in cracking and buckling of river beds and rock bars and localised loss of water flow.

Visibility: The amount of bare ground on exposures which might reveal artefacts or other archaeological materials.

Yellow earths: predominantly sandy-textured soils with earthy porous fabric, weak profile differentiation and gradual or diffuse boundaries except for the darker A1 horizon.

Yellow podosols: Podosols which typically occur on the upper slopes of steep landscapes and on the mid to lower slopes of others. The A2 soil horizon is present in most profiles and the boundary change to the B horizon is generally clear. The B horizon is typically sandy clay to heavy clay.

Appendix A
Legislative context

EMM
creating opportunities

A.1 Commonwealth

A.1.1 Aboriginal and Torres Strait Islander Heritage Protection Act 1984

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* preserves and protects areas (especially sacred or intangible sites) and places of particular significance to Aboriginal people from damage or destruction. Steps necessary for the protection of a threatened place are outlined in a gazetted Ministerial Declaration (Sections 9 and 10); and which can result in a cessation of any development activity.

In addition, the Act also protects objects by Declaration, notably Aboriginal skeletal remains (Section 12). This can be applied at a State level where a State is unwilling or unable to provide such protection.

A.1.2 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* provides for protection of natural and cultural heritage places. The Act establishes a National Heritage List (NHL) and a Commonwealth Heritage List (CHL) upon which places of natural or cultural significance can be listed. Sites at a national level and can be in public or private ownership. The CHL is limited to places owned by the Commonwealth, and most frequently encompass Department of Defence sites. Sites and places listed on the NHL are considered to be of State and local heritage value, even if they are not listed or documented as such at a State level.

The values of sites and places on the NHL/ CHL are protected under the EPBC Act. The Act requires that the Minister administering the Act assess any action which has, will have, or is likely to have, a significant impact on the heritage values. Where relevant, a referral is made to the relevant Commonwealth Department, and either approval, approval with controls, or rejection of the proposed action is determined.

A.1.3 Native Title Act 1993

The *Native Title Act 1993* provides recognition and protection for native title. The Act establishes the managing body, National Native Title Tribunal, who administers native title claims to rights and interests over lands and waters by Aboriginal people. It also administers the future act processes that allow proponents to identify and manage potential native title issues for a given activity on a site where a claim has yet to be made or finalised.

In addition, the Act provides for Indigenous Land Use Agreements (ILUA), which is an agreement between a native title group and others about the use and management of land and waters. ILUAs were introduced as a result of amendments to the Act in 1998. They allow people to negotiate flexible and bipartisan agreements to suit their particular circumstances often circumventing lengthy timeframes associated with the native title process. An ILUA can be negotiated over areas where native title has, or has not yet, been determined. They can be part of a broader determination or settled separately.

A.2 State

A.2.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) is the over-arching Act that dictates the nature of assessment and management of the environment during a development project, and within which heritage forms a component, requires that environmental and heritage impacts are considered by consent authorities prior to granting development approvals.

The Act has two main approval pathways within which heritage needs to be considered. Generally, for smaller scale (either financially or spatially), Parts 4 (Division 4.1) and 5 (Division 5.1) of the Act are implemented. Part 4 requires that a proponent submits a Development Application (DA) to local council for a given development, and within this document a consideration of Aboriginal and historical heritage is required. The specific nature of the assessment is usually determined at a pre-DA meeting with the council, and in relation to the relevant heritage Acts. Where Aboriginal heritage is identified as an issue, the DA may become Integrated Development, whereby the State government is also required to review and provide comments on the DA prior to its issue. Part 5 of the Act is a similar process, but only relates to approvals developed and issued by State government departments. Each State government department has their own internal approach to considering environmental issues, but ultimately must develop a Review of Environmental Factors (REF), which is comparable to a DA, and which requires consideration and management of heritage. Similarly, where heritage is identified as an issue, liaison with relevant State consent authorities and approvals under other Acts may still be required.

The other approval pathway relates to State Significant Development and/or Infrastructure (Parts 4.7 and 5.2, respectively). These processes require an Environmental Impact Statement (EIS) to be developed for a project and assessed currently by the Department of Planning, Industry and Environment. Importantly, the SSD and SSI processes turns off a number of pieces of other legislation, including parts of the *National Parks and Wildlife Act 1974*. In the case of Aboriginal heritage, both the assessment and approval for harm are dictated by the Secretary's Environmental Assessment Requirements (SEARs) outlining the contents and scope of the EIS, and the Project Approval that dictates controls on how a development should proceed.

A.2.2 National Parks and Wildlife Act 1974

The National Parks and Wildlife Act 1974 (NPW Act) provides protection for Aboriginal objects and places across NSW.

An Aboriginal object is defined as:

> Any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains.

An Aboriginal place is defined as: any place declared to be an Aboriginal place under Section 84. This is a very specific piece of legislation that provides process and management of Aboriginal sites of cultural, but not necessarily scientific, values. They are commonly, but not always associated with intangible values.

Any place declared to be an Aboriginal place by the Minister for the Environment, under Section 84 of the Act, is also protected.

It is an offence to disturb Aboriginal objects or places without an Aboriginal Heritage Impact Permit (AHIP), which is outlined in Section 90 of the Act. Currently, such permits can be sought from the Chief Executive of the NSW Department of Premier and Cabinet (DPC), with the recent relocation of the Office of Environment and Heritage.

To obtain an AHIP, certain assessment and documentation (outlined in this report) must be provided to DPC for their consideration. Once satisfied, they may endorse an AHIP to harm cultural heritage either conditionally or unconditionally. They can also refuse an application as outlined in Section 90C of the Act, and which can be appealed in accordance with Section 90L.

A.2.3 Aboriginal Land Rights Act 1983

The *Aboriginal Land Rights Act 1983* provides process and protocols for the transfer of vacant Crown land ownership to a Local Aboriginal Land Council, where the land is not for an essential purpose or for residential land. These lands are then managed and maintained by the Local Aboriginal Land Council.

For the purposes of this report, the Act is primarily important to inform relevant Aboriginal communities for consultation; and where Crown land forms part of the development area may require additional liaison with the LALC as a potential, or existing, landowner.

Appendix B

Aboriginal community consultation

EMM
creating opportunities

B.1 Consultation log and communications record

Aboriginal Consultation Requirements for Proponents

ABORIGINAL COMMUNICATIONS LOG

Project Name: Gunlake Quarry | **Project #:** XXX

DATE	OUTGOING / INCOMING	ORGANISATION	CONTACT MADE BY	CONTACT TO	CONTACT TYPE	COMMENTS
METHODOLOGY						
29-Aug-25	Outgoing	[redacted]	Angus Lynch (EMM)	Various	Email	Distirbuted proposed assessment methods to all RAPS - requested comments by 26 Sept - see Appendix B2
29-Aug-25	Incoming	[redacted]	[redacted]	Angus Lynch (EMM)	Email	Automatic reply - expect response in approx 3 business days
29-Aug-25	Incoming	[redacted]	Angus Lynch (EMM)	[redacted]	Email	Automatic reply - email bounced, no alternative contact provided
29-Aug-25	Incoming	[redacted]	[redacted]	Angus Lynch (EMM)	Email	Endorsing recommendations in the ACHA
05-Sep-25	Outgoing	All RAPs	Angus Lynch (EMM)	Various	Email	Informed all RAPS on the potential need for test excavations and attached map of proposed test pits - requested comments by COB 26 September - see Appendix B2
05-Sep-25	Incoming	[redacted]	Tyronne & Bron Bell	Angus Lynch (EMM)	Email	Automatic reply - expect response in approx 3 business days
05-Sep-25	Incoming	[redacted]	Angus Lynch (EMM)	[redacted]	Email	Automatic reply - error message
10-Sep-25	Incoming	[redacted]	[redacted]	Angus Lynch (EMM)	Email	[redacted]
12-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Email	Acknowledging response and informing them that we will update them as project progresses.
FIELDWORK - SURVEY & TEST EXCAVATION						
16-Sep-25	Outgoing	EMM ACH Team	Georgia Burnett (EMM)	OEH HD Heritage Mailbox, Angus Lynch, Alan Williams, Taylar Reid (EMM)	Email	Distributed proposed test excavation methodology to Heritage NSW.
16-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Email	Distributed test excavation email and seeking site representative availability for 3 days scheduled between Tuesday 30 September and Thursday 2 October 2025.
17-Sep-25	Incoming	[redacted]	[redacted]	Angus Lynch (EMM)	Email	[redacted]
17-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Email	[redacted]
18-Sep-25	Incoming	[redacted]	[redacted]	Angus Lynch (EMM)	Email	Email accepting the invitation to fieldwork
18-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Email	Email containing the EMM RAP registration form
18-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Phone	[redacted]
18-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Email	Sent the EMM RAP registration form and asked for insurance information.
18-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Email	Emailseeking relevant insurance information required.
18-Sep-25	Incoming	[redacted]	[redacted]	Angus Lynch (EMM)	Email	Email containing signed EMM subcontractor form and relevant insurance info.
18-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Phone	[redacted]
18-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Email	Sent through the completed PLALC booking form and contract for fieldwork
19-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Email	Sent through contract for fieldwork to be filled.
19-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Phone	[redacted]
19-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Email	[redacted]
19-Sep-25	Incoming	[redacted]	[redacted]	Angus Lynch (EMM)	Phone	Called to say that he's unavailable, but has someone that can make it. Angus asked him to send through the contact details and insurances of this person via email asap.
21-Sep-25	Incoming	[redacted]	[redacted]	Angus Lynch (EMM)	Email	[redacted] .
21-Sep-25	Incoming	[redacted]	[redacted]	Angus Lynch (EMM)	Email	Endorsing recommendations in the assessment methods and the proposed test pits.
22-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Email	[redacted]
22-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Email	Acknowledging response.
22-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Phone	[redacted] .
22-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Phone	[redacted] .
22-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Phone	[redacted] .
23-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Phone	[redacted] .
23-Sep-25	Incoming	[redacted]	[redacted]	Angus Lynch (EMM)	Email	[redacted]
23-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Email	[redacted] .
23-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Email	[redacted]
25-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Phone	[redacted]

25-Sep-25	Incoming	[redacted]	[redacted]	Angus Lynch (EMM)	Phone	[redacted]
25-Sep-25	Incoming	[redacted]	[redacted]	Angus Lynch (EMM)	Email	[redacted]
25-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Email	[redacted]
25-Sep-25	Incoming	[redacted]	[redacted]	Angus Lynch (EMM)	Email	[redacted]
25-Sep-25	Incoming	[redacted]	[redacted]	Angus Lynch (EMM)	Phone	[redacted]
25-Sep-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Email	[redacted]
30- Sept-25 - 02-Oct-5	-	[redacted]	various	Phillipa O'Brien-Pounde and Angus Lynch (EMM)	-	Undertook field survey and test excavation.
ADDITIONAL CONSULTATION						
02-Oct-25	Incoming	[redacted]	[redacted]	Angus Lynch (EMM)	Phone	Missed call, no message left.
02-Oct-25	Incoming	[redacted]	[redacted]	Angus Lynch (EMM)	Phone	Missed call, no message left.
02-Oct-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Phone	No answer, left a message.
02-Oct-25	Outgoing	[redacted]	Angus Lynch (EMM)	[redacted]	Phone	[redacted]
03-Oct-25	Incoming	[redacted]	[redacted]	Angus Lynch (EMM)	Email	[redacted]
03-Oct-25	Outgoing	[redacted]	Taylar Reid	Payments EMM, Angus Lynch and Phillipa O'Brien-Pounde (EMM)	Email	[redacted]
16-Oct-25	Outgoing	[redacted]	Phillipa O'Brien-Pounde (EMM)	[redacted]	Phone	[redacted]
16-Oct-25	Outgoing	[redacted]	Phillipa O'Brien-Pounde (EMM)	[redacted]	Phone	[redacted]
16-Oct-25	Outgoing	[redacted]	Phillipa O'Brien-Pounde (EMM)	[redacted]	Email	[redacted]
16-Oct-25	Incoming	[redacted]	[redacted]	Phillipa O'Brien-Pounde (EMM)	Email	[redacted]
DRAFT ACHA						
22-Oct-25	Outgoing	Various	Phillipa O'Brien-Pounde (EMM)	Various	Email	Distributed draft ACHA report for review to all RAPs for 28 day review period. Review period ends on 19 November 2025.
12-Nov-25	Outgoing	Various	Phillipa O'Brien-Pounde (EMM)	Various	Email	Sent a reminder that RAP review period for the draft ACHA report ends in 7 days on Wednesday 19 November 2025.

B.2 List of identified Aboriginal stakeholders in the region



- [redacted]

[redacted]

B.3 Stage 1 – Notification and registration

Phillipa O'Brien-Pounde

From: Alan Williams <awilliams@emmconsulting.com.au>
Sent: Wednesday, 23 July 2025 8:58 AM
To: Alison Lamond Heritage NSW
Cc: OEH HD Heritage Mailbox; Phil Towler; Nicholas Dent
Subject: Gunlake Quarry Continuation Project - MOD3 - ACH - assessment direction request

Dear Alison and team,

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Can you please advise if you are satisfied with this approach, or whether you'd prefer some other form of assessment and/or consultation to be undertaken?

Happy to discuss – or organise a meeting to further explain

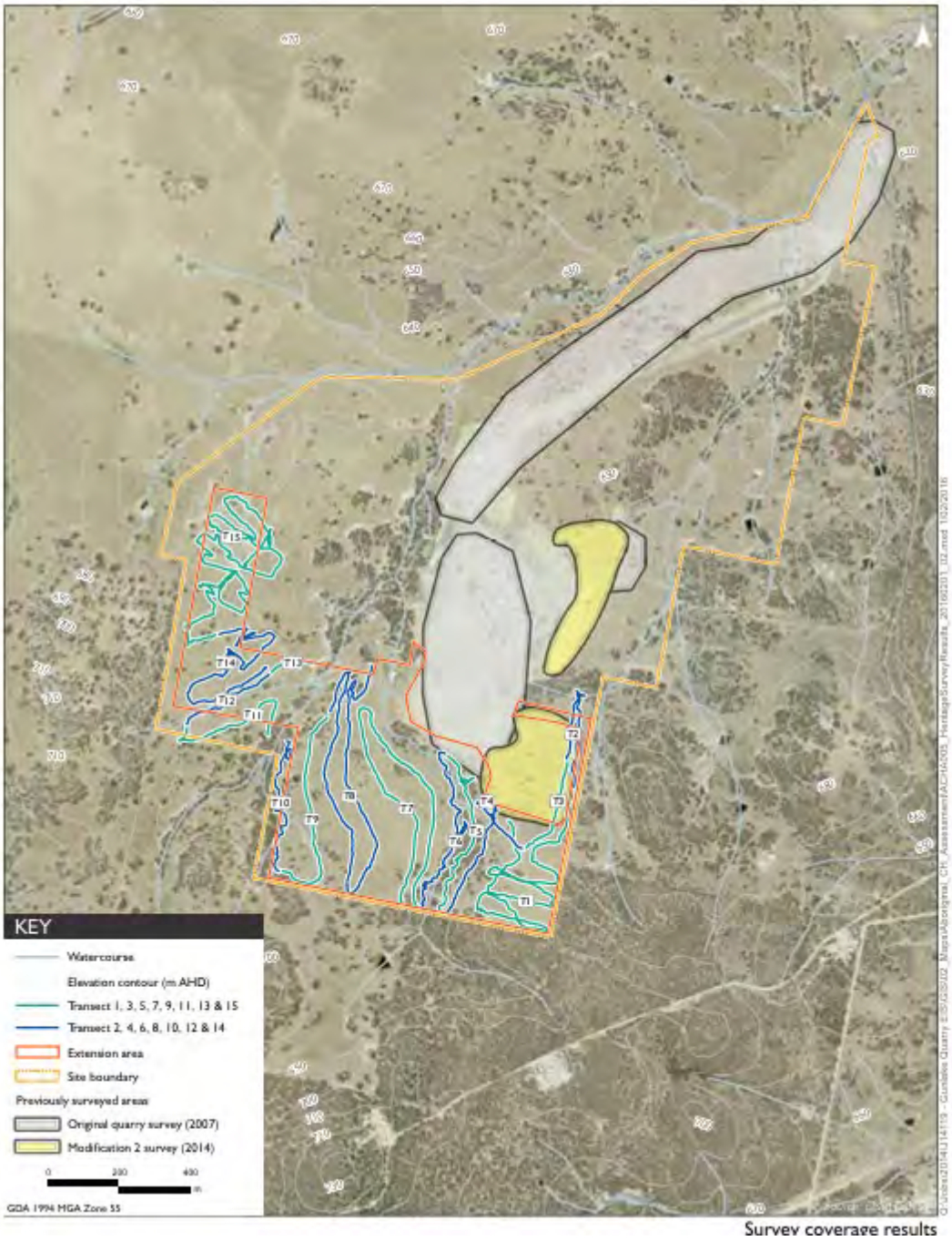
Thanks

Al

Proposed modification footprint:



Extension Project field survey activities:



Survey coverage results

Dr Alan Williams FSA FRSA FRSN MAACAI MAIATSIS MEIANZ
Technical Lead, Aboriginal Heritage|Associate Director

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T 02 9493 9500
M 0438 104 740
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emmconsulting.com.au

SYDNEY | Kameraigal Country | Level 10, 201 Pacific Highway, St Leonards NSW 2065

Climate Active Carbon Neutral ORGANISATION

CLIENTCHOICE Awards 2025 winner

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ARC Centre of Excellence for Indigenous and Environmental Histories and Futures (CIEHF)

Industry Fellow
Institute of Sustainable Futures
University Technology Sydney
Ultimo, NSW 2007

Adjunct Senior Lecturer
School of Biological, Earth and E Sciences
University of New South Wales,
Sydney, NSW 2052

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Phillipa O'Brien-Pounde

From: Alison Lamond (Heritage NSW) <support@zendesk.environment.nsw.gov.au>
Sent: Monday, 4 August 2025 11:54 AM
To: Alan Williams
Subject: Request #56375 has been updated: Gunlake Quarry Continuation Project - MOD3 - ACH - assessment direction request

Follow Up Flag: Follow up
Flag Status: Flagged

Your request has been updated. To add additional comments, reply to this email.

Hello Alan,
Thank you for reaching out to Heritage NSW regarding your proposed State Significant Development (SSD) modification for the Gunlake Quarry Continuation Project – MOD3.
We understand that you are preparing to submit the modification report and associated technical assessments. Heritage NSW supports your proposed approach of addressing the modification area and associated impacts through an addendum to the existing ACHA, and continuing consultation with the established RAP group.
Please include this email as part of the supporting documentation for the ACHA.
Kind regards,
Alison

Alison Lamond
Heritage NSW
Department of Climate Change, Energy, the Environment and Water (DCCEEW)
T: 02 9873 8500 E: heritagemailbox@environment.nsw.gov.au
https://www.environment.nsw.gov.au/topics/heritage
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On 22 July 2025 at 11:19:23 pm UTC, Dr Alan Williams awilliams@emmconsulting.com.au wrote:

Alan Williams reacted to your message:

From: Tanya Pelz (Heritage NSW) <support@zendesk.environment.nsw.gov.au>
Sent: Tuesday, July 22, 2025 11:16:56 PM
To: Alan Williams <awilliams@emmconsulting.com.au>
Subject: Request #56375 has been updated: Gunlake Quarry Continuation Project - MOD3 - ACH - assessment direction request

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Dear Alan

Thank you for your email regarding Gunlake Quarry Continuation Project.

This has been forwarded onto the Major Project team who will get back to you shortly with a response.

If you have any other questions in the meantime, please do not hesitate to contact our team.

Kind regards

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Thanks

Al

Proposed modification footprint:

B.4 Stages 2 and 3 – presentation of information and gathering cultural information

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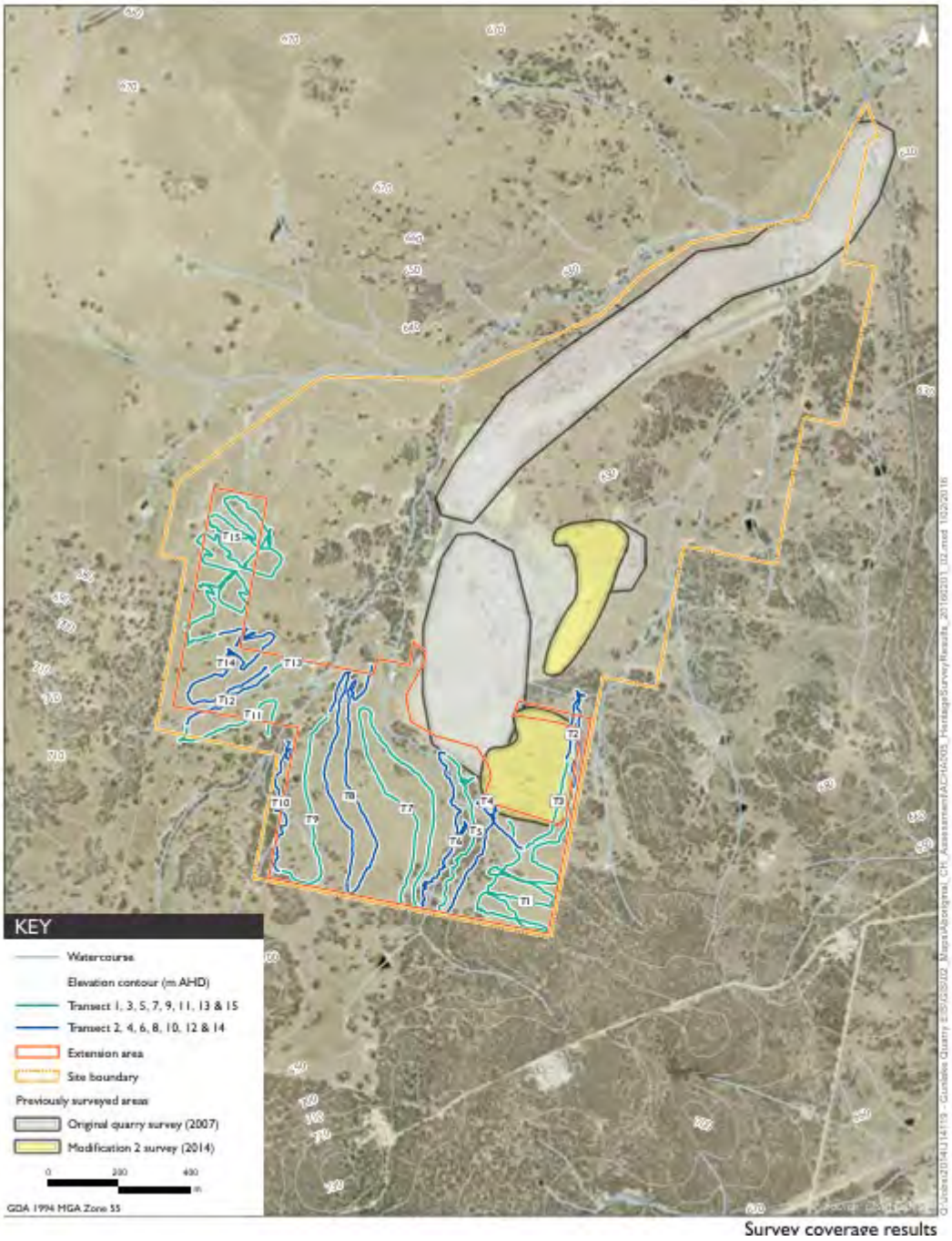
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Dr Alan Williams FSA FRSA FRSN MAACAI MAIATSIS MEIANZ
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Given the scale of previous investigation that partially included the area of the proposed modification (see figures below) and the ongoing consultation associated with both the Extension and Continuation project ACHMPs, our preference is to undertake a short addendum to the existing ACHA (EMM, 2016). Based on other projects, we feel restarting the consultation process may result in confusion within the local Aboriginal community, and potential complications from organisations that may become involved but have no connection or relationship with earlier parts of the project. The addendum itself would be reliant on existing information, with a small field component to fill the gaps from the previous investigations, and with consultation beginning at Stage 2 of the Heritage NSW consultation guidelines with the established registered Aboriginal parties.

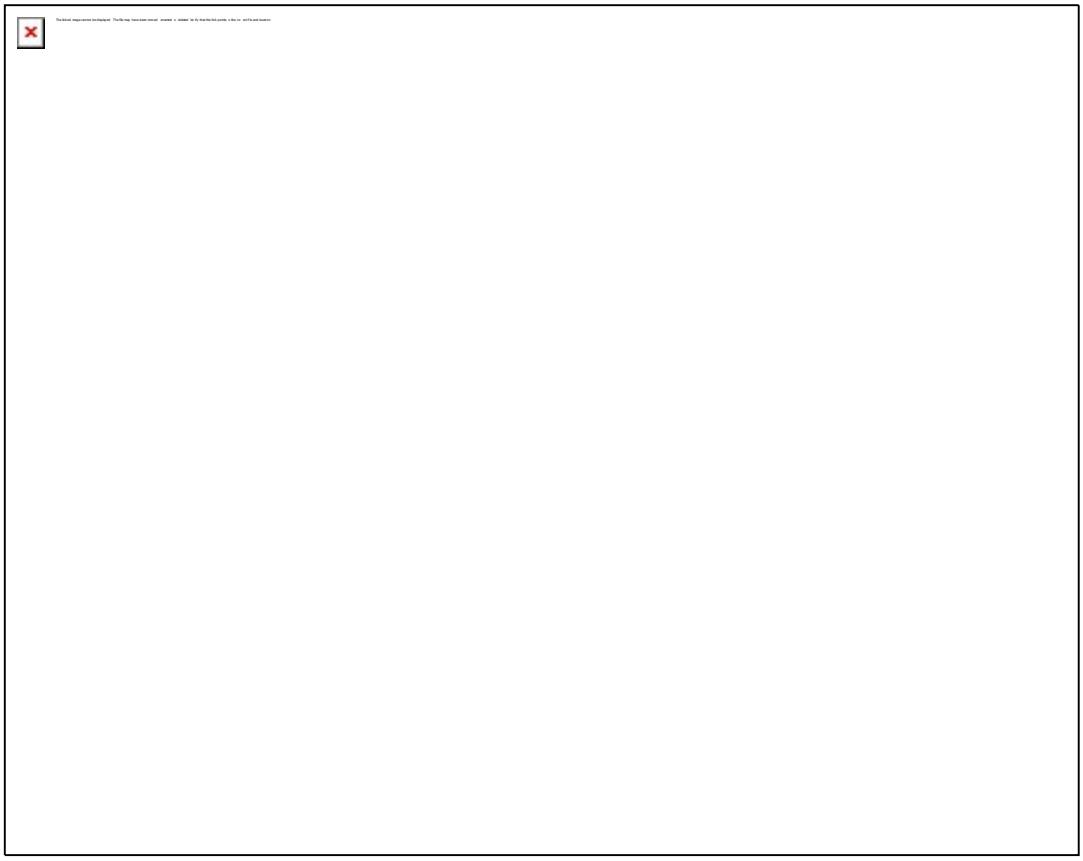
Can you please advise if you are satisfied with this approach, or whether you'd prefer some other form of assessment and/or consultation to be undertaken?

Happy to discuss – or organise a meeting to further explain

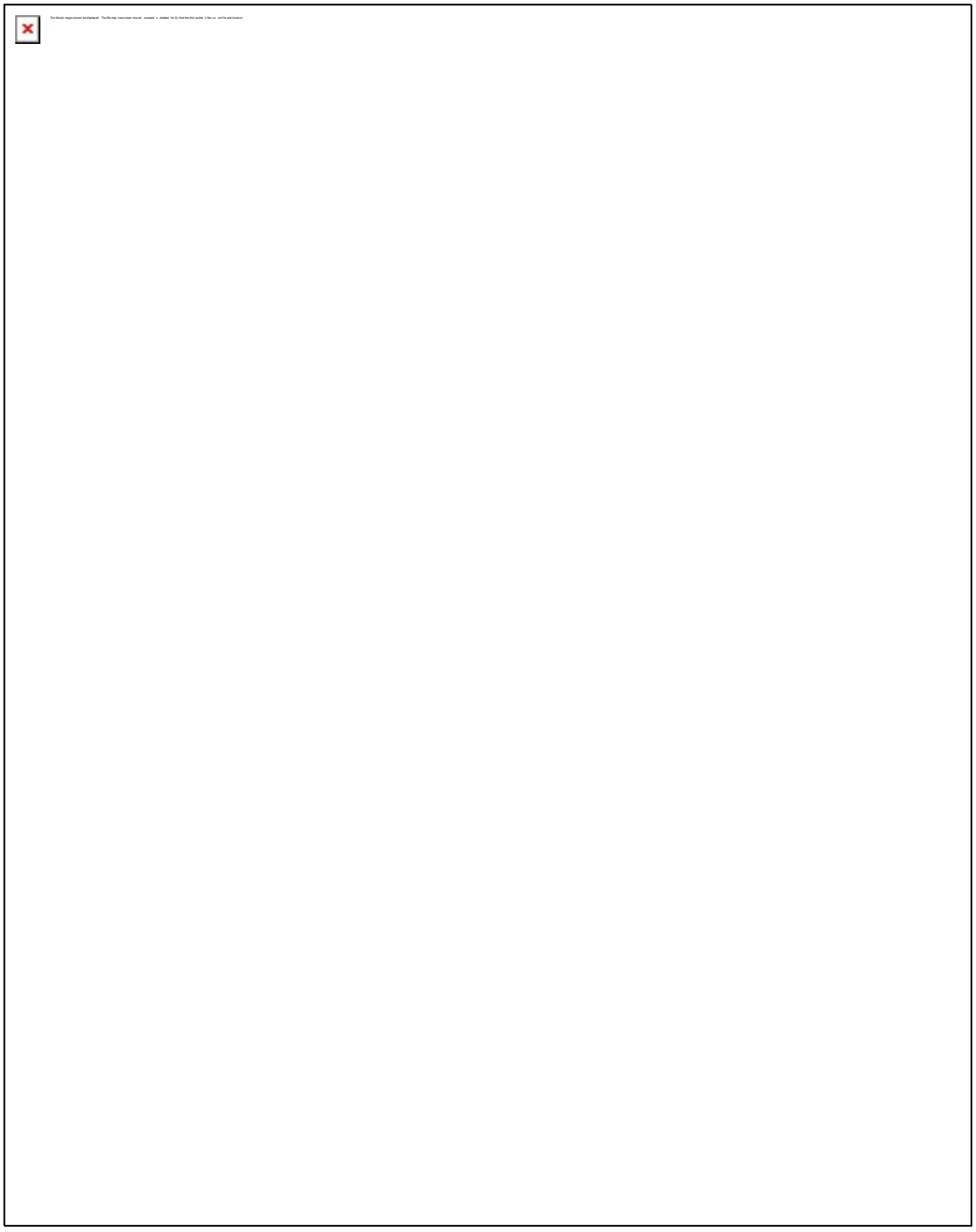
Thanks

Al

Proposed modification footprint:



Extension Project field survey activities:



Dr Alan Williams FSA FRSA FRSN MAACAI MAIATSIS MEIANZ
Technical Lead, Aboriginal Heritage|Associate Director



T 02 9493 9500
M 0438 104 740
LI Connect on LinkedIn
emmconsulting.com.au

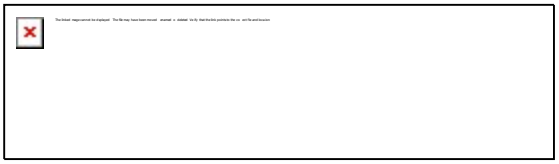
SYDNEY | Kameraigal Country | Level 10, 201 Pacific Highway, St Leonards NSW 2065



Partner Investigator
ARC Centre of Excellence for Indigenous and Environmental Histories and Futures (CIEHF)

Industry Fellow
Institute of Sustainable Futures
University Technology Sydney
Ultimo, NSW 2007

Adjunct Senior Lecturer
School of Biological, Earth and
Sciences
University of New South Wales
Sydney, NSW 2052







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Level 10 201 Pacific Highway
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ABN: 28 141 736 558

02 9493 9500

www.emmconsulting.com.au

29 August 2025

Re: Gunlake Quarry Continuation Project, Marulan - Modification #3 - Aboriginal cultural heritage assessment - project information and assessment methodology

Dear Sir/Madam,

1 Introduction

EMM Consulting Pty Ltd (EMM) have been engaged by Gunlake Quarries Pty Ltd (Gunlake) to assist them in a modification application for their existing approval for operations at the Gunlake Quarry, 715 Brayton Road, Marulan NSW (Figure 1.1). The quarry was originally approved in 2008 (MP 07_0074). Two new consents have been approved since that time, to allow expanded operations, the 'Extension Project' in 2017 (SSDA 7090); and the 'Continuation Project' (SSD-12469087) in 2023. Gunlake is applying to modify the Continuation Project to allow for an expansion of the Western Overburden Emplacement (Figure 1.2). No other changes are proposed to the quarry or its operations.

Extensive Aboriginal consultation and site investigations have been undertaken extending back to 2007 in relation to the original quarry project and the subsequent Extension and Continuation Projects. This has included a comprehensive Aboriginal cultural heritage assessment undertaken for the Extension Project that incorporated both field survey and test excavations between April 2015 and February 2016, as well as the development of an Aboriginal cultural heritage management plan (ACHMP) for the project in 2018. Subsequent activities have included the implementation of the ACHMP requirements (e.g. fencing of sites, artefact recovery, etc.) and various updates of the plan in recent years to support the Extension and Continuation Projects, including through late 2023/early 2024, and in early 2025 (see Section 2 for further details).

As part of investigations to inform a Modification Report for the Continuation Project, Gunlake has engaged EMM to prepare an addendum to the existing ACHA. This will include identification of cultural materials within the proposed extension of the Western Overburden Emplacement (the 'modification area'), determining any potential impacts, and developing suitable Aboriginal cultural heritage management strategies.

The addendum assessment is being undertaken in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010). This document forms part of the formal Aboriginal consultation requirements for the project, as described in sections 4.2 (Stage 2) and 4.3 (Stage 3) of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010).

The aims of this letter are to:

- provide an overview of the modification and how it will be assessed
- provide background on the modification and some of the investigations to date
- establish the purpose and aims of the Aboriginal consultation process
- seek information about any Aboriginal cultural heritage values and sensitivities associated with the modification and how they may affect, inform or refine the project and/or assessment methods
- seek information on any cultural activities (such as fishing and hunting) that have historically and/or are actively being undertaken in the modification area
- identify any culturally appropriate protocols that registered parties wish to be adopted during the information gathering process (e.g. protocols during field survey, or handling of culturally sensitive information); and
- present a draft of the intended assessment methods for your review and comment.

We welcome your feedback at your earliest convenience. We will be consulting with the registered Aboriginal parties for the duration of the ACHA. However, for the purposes of this initial stage of consultation and in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010), we request any written or verbal response on the information and process included below by **COB 26 September 2025.**

Contact details for the proponent are:

Kirsty Nielsen, Environment Manager

Post Office Box 209

Marulan, NSW 2579

T: 0402 755 763

E: kirsty@gunlake.com.au

EMM is working on the applicant's behalf, and all queries should be directed through EMM. Feedback can be provided to:

Georgia Burnett, Senior Archaeologist

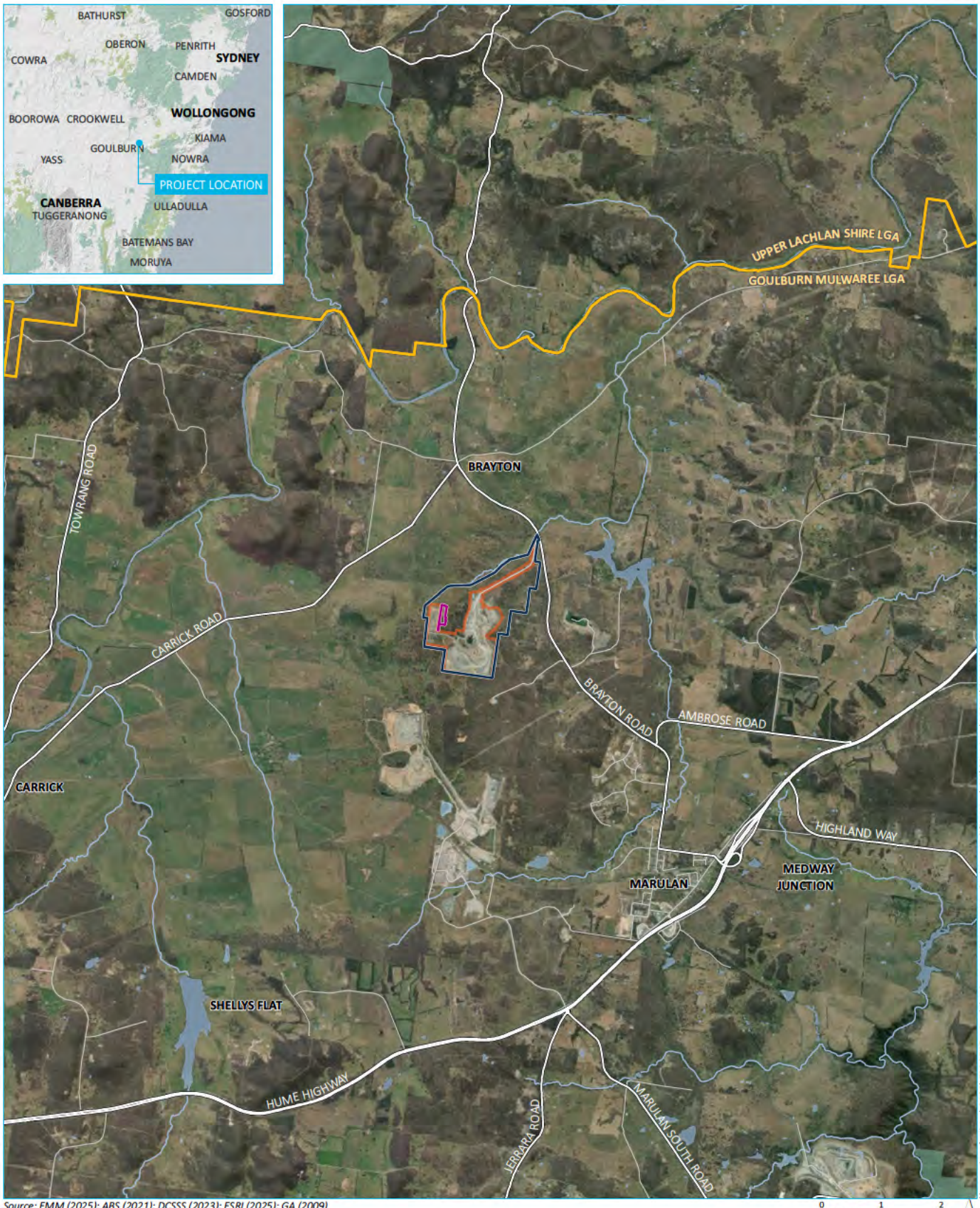
EMM Consulting Pty Ltd

Level 10, 201 Pacific Highway

St Leonards NSW 2065

T: 0459 295 806

E: gburnett@emmconsulting.com.au



Source: EMM (2025); ABS (2021); DCSSS (2023); ESRI (2025); GA (2009)

0 1 2 km

GDA2020 MGA Zone 56

N

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KEY

- Modification 3 disturbance area
- Site boundary
- Continuation project disturbance area

Existing environment

- Major road
- Minor road
- Named watercourse
- Waterbody
- NPWS reserve
- Local government area

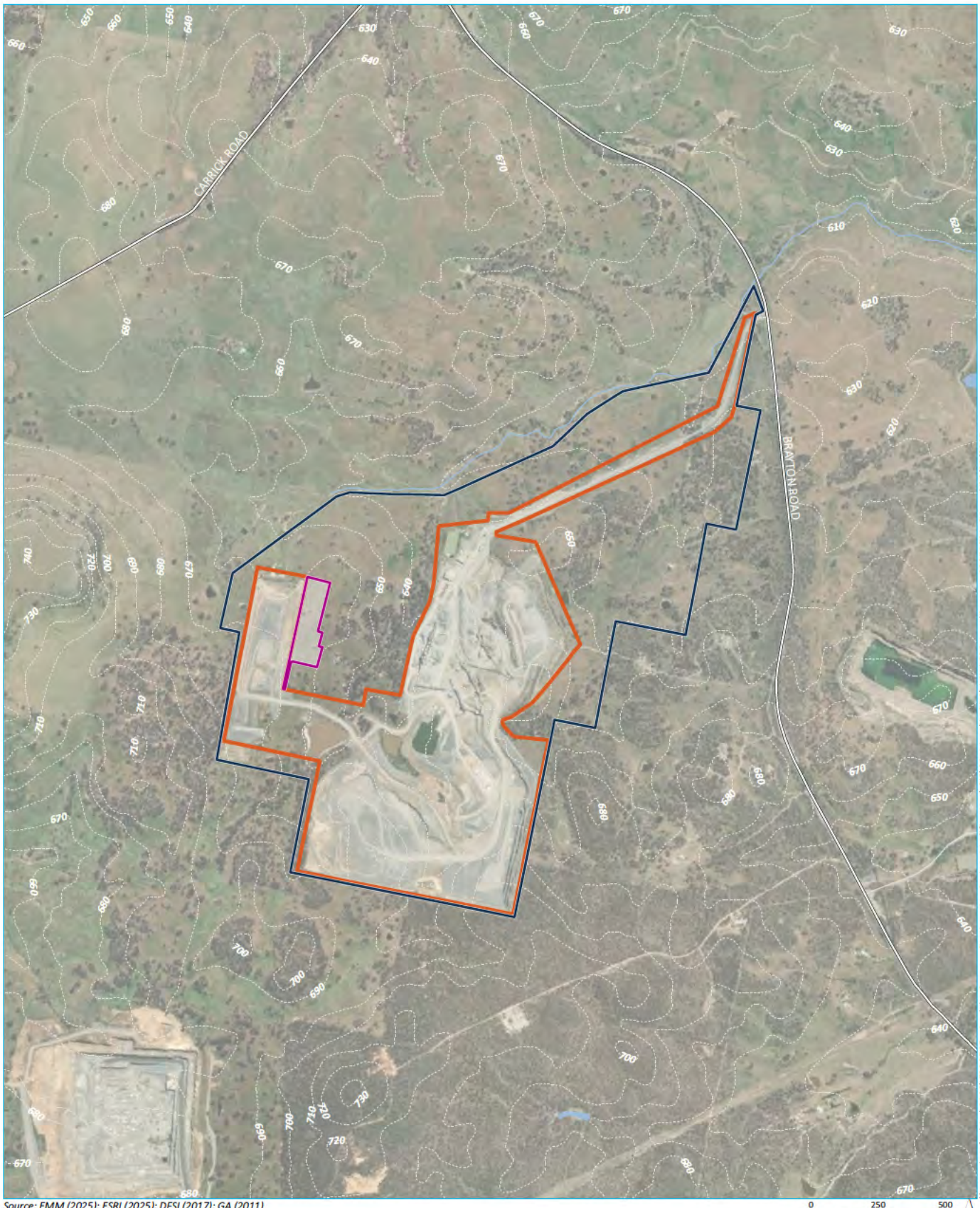
INSERT KEY

- NPWS reserve
- State forest

Regional context

Gunlake Quarry Continuation Project
Modification 3
Aboriginal Stakeholder Consultation
Figure 1.1

EMM
creating opportunities



Source: EMM (2025); ESRI (2025); DFSI (2017); GA (2011)

0 250 500 m
GDA 1994 MGA Zone 55
N

KEY

- Modification 3 disturbance area
- Site boundary
- Continuation project disturbance area
- Major road
- Minor road
- Topographic contour (10 m interval)
- Named watercourse
- Waterbody

Local context

Gunlake Quarry Continuation Project
Modification 3
Aboriginal Stakeholder Consultation
Figure 1.2

EMM
creating opportunities

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2 Previous investigations

As outlined in previous sections, Gunlake Quarry was originally approved in 2008 (MP 07_0074). Two new consents have been subsequently granted to allow expanded operations, the 'Extension Project' in 2017 (SSDA 7090); and the 'Continuation Project' (SSD-12469087) in 2023. As part of these approval processes, three Aboriginal Cultural Heritage Assessments have been developed (Australian Archaeological Survey Consultants [AASC] 2008; Cultural Heritage Management Australia [CHMA] 2014; EMM Consulting Pty Ltd [EMM] 2016), as well as an Aboriginal Cultural Heritage Management Plan (Gunlake Quarry 2025), which regulates the management of cultural heritage items within the Continuation Project Area. Plate 2.2 shows the Aboriginal sites identified within and adjacent to the project that have resulted from these assessments.

The initial investigation for the hard rock quarry was undertaken in 2008 by AASC. The initial site covered ~230 hectares, and included project elements such as the quarry, processing and stockpile areas, overburden emplacement, and haul roads. During the course of the field survey undertaken as part of the ACHA, three small artefact scatters, all with no more than six artefacts at each site, were identified: GL1 (#51-6-0747), GL2 (#51-6-0748), and GL3 (#51-6-0749), the closest site to the modification area being GL1 which is approximately 1 km west. All were identified as having low significance due to their small size, with other more extensive artefact sites being well represented in the archaeological record of the region. A further two sites, an isolated find (GL4; #52-4-0382) and one artefact scatter comprising two artefacts (GL5; #52-4-0383), were identified some distance (>4 km) away from the modification area. These sites were similarly assessed as being of low significance. All sites have since been collected and reburied outside of the Continuation Project Disturbance area, and have been registered on AHIMS as GL123 (#51-6-0750) and GL45 (#52-4-0384).

In 2014, CHMA completed an ACHA for a modification to the pit and overburden embankment areas (CHMA 2014). Desktop assessment identified moderate–high archaeological potential within the assessment area, due to the presence of locally flat areas adjacent to an ephemeral watercourse (Chapman's Creek) and being within travelling distance of other more permanent water sources (e.g. Joarimin Creek, Wollondilly River). However, in line with other local studies, the assessment area was "predicted to demonstrate evidence of sporadic use by prehistoric Aboriginal people, in the form of infrequent, low density open artefact scatters comprising less than 10 artefacts" and thus would be of low archaeological significance if present (CHMA 2014, p. 40). No Aboriginal objects were identified during the survey. The absence of surface artefacts was attributed to highly eroded soils, extensive rocky outcrops and the considerable distance to permanent water (over 1 km) which arguably made the area unsuitable for anything other than transitory occupation. CHMA determined that only unpredictable deposits of artefacts would occur across the landscape (CHMA 2014, p. 2). No test excavation was recommended because outcropping bedrock dominated the ground surface, limiting the potential for intact soil deposits. The assessment area was assessed to have low archaeological potential, and no further investigation was recommended.

In 2016, another ACHA was developed for the Extension Project, which aimed at expanding the quarry pit footprint, establishment of the Western Overburden Emplacement, and modifying infrastructure (EMM 2016). Similar to previous assessments, the desktop assessment concluded that artefact sites were the most likely site type to occur within the project area, with more extensive sites likely to occur on hill crest, hill spur crest, and footslope landforms. The survey undertaken for the assessment identified 15 Aboriginal sites, including 12 artefact scatters and three isolated finds. Notably, part of the survey included a portion of the current modification area (Plate 2.1). The majority of surface sites were identified as low-density artefact scatters, exhibiting <20 objects per site, and more commonly <5. The highest densities of artefacts were identified on a hill spur crest on the western side of the site, and includes GL14a (n=32), GL14b (n=3), GL14c (n=235), and GL14d (n=11). The subsequent test excavation of this area aimed to resolve whether the surface material was indicative of a more extensive subsurface deposit. The test excavation comprised 42 x 1 m^2 test pits along eight transects, targeting landforms of interest, and which recovered a total of 89 artefacts, averaging 2.12 artefacts/m^2. The majority of artefacts (95%) were recovered from the top 20 cm of soil, indicating an eroded and/or truncated landscape. Transect 5 that investigated GL14c, recovered the most artefacts (n=35), followed by Transect 8,

which investigated GL14b and recovered 21 artefacts. All other transects recovered <20 artefacts or were culturally sterile. No new sites were identified as part of the test excavations, and the results indicated that GL14a-d may be inferred as a single larger site across the hill spur crest landform, albeit presented as fragmented concentrations.

Based on these findings, the assessment concluded that, aside from GL14a-b, all other sites (n=10) were considered to have low significance due to the limited archaeological potential, their small size, and lack of further research potential. GL14a-d were assessed as retaining moderate significance due to the density of material present, although significance was constrained by the disturbance of the cultural deposit. As the Extension Project proposed impact to seven of the 11 identified sites, a key recommendation from the assessment was updates to the Aboriginal Cultural Heritage Management Plan (ACHMP) to further manage these sites into the future.

Subsequently, an initial iteration of the ACHMP was developed in 2018, and has been subject to ongoing update since that time – the latest version having occurred in mid-2025 (Gunlake Quarry 2025). The ACHMP includes measures to protect, monitor, and manage identified and newly documented Aboriginal sites, facilitate archaeological investigations, and ensure ongoing consultation with Registered Aboriginal Parties (RAPs) and Heritage NSW. Under the ACHMP, 13 of the 18 sites identified during the various assessments have been salvaged in accordance with the various methodologies outlined in the document. Of the five remaining sites, two sites are artefact reburial sites which are being actively protected by the quarry. Two sites, GL4ext (#47-6-0777) and GL12 (#47-6-0784), are not proposed to be impacted and are being actively protected; only one remaining site, GL13 (#47-6-0786), is proposed for collection prior to impacts and has not been implemented to date.



Plate 2.1 **Survey transects completed as part of the field survey in 2016, with the blue outline indicating the general vicinity of the modification area (extracted from EMM 2016, p. 37).**

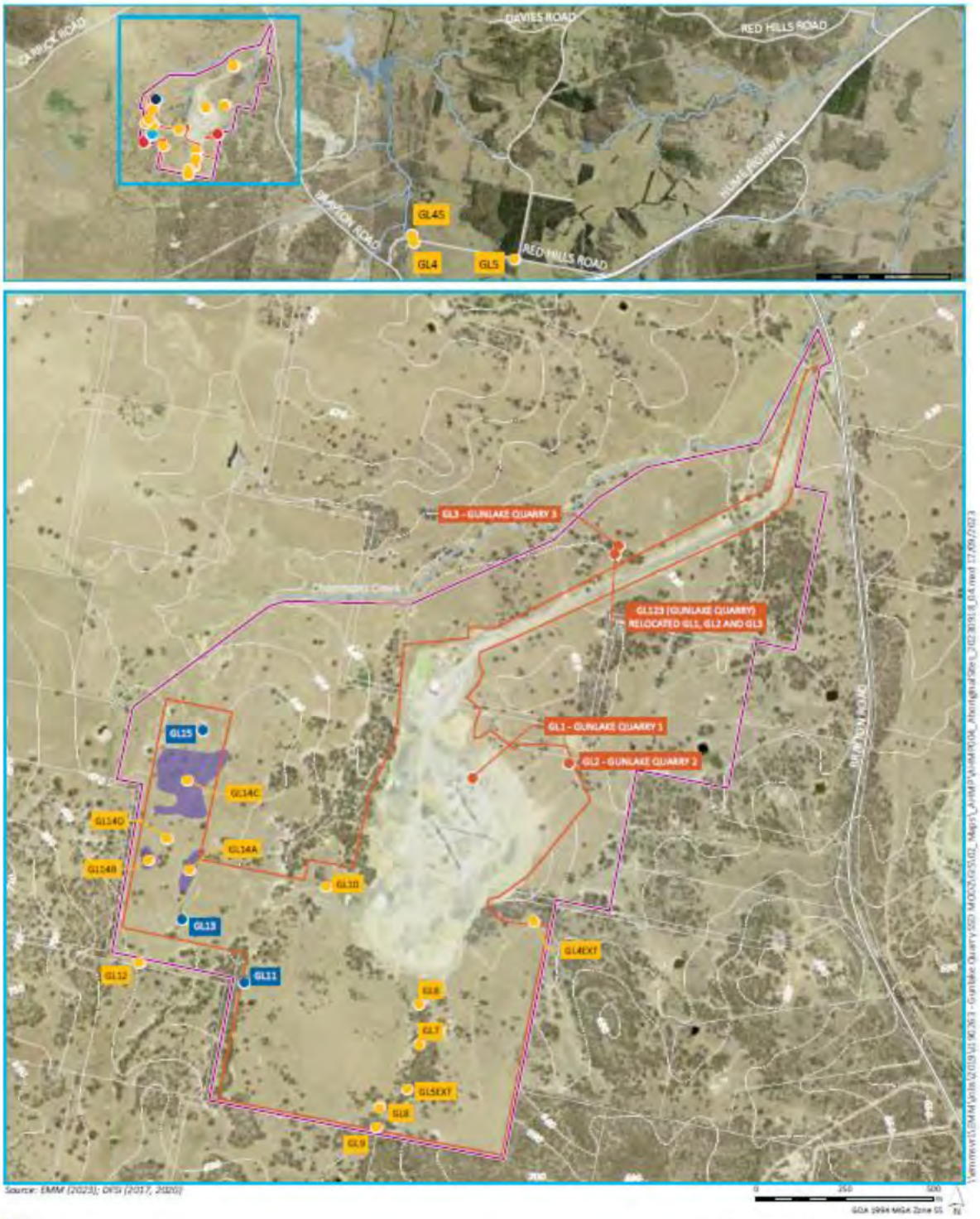


Plate 2.2 **Recorded Aboriginal sites within the Gunlake Quarry site boundary (extracted from Gunlake Quarry 2025, p. 19). All except GL4ext, GL12, GL13, GL123 and GL45 have been destroyed by authorised impacts and/or natural site processes (e.g. erosion).**

3 Aboriginal stakeholder engagement

Given the scale of previous investigation, it was felt that restarting the consultation process for Modification 3 of the Continuation Project may result in confusion within the local Aboriginal community, and potential complications from organisations that may become involved but have no connection or relationship with earlier parts of the project. Discussions with Heritage NSW were undertaken to determine the most suitable process, and ultimately it was concluded that continuing consultation with the established RAPs should be undertaken. As such, this assessment will form an addendum to the existing ACHA (EMM 2016), and will consult with the following:

- [redacted]

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

The roles, functions and responsibilities of all RAPs involved in the consultation process are outlined in Table 3.1.

Table 3.1 Roles and responsibilities

Party	Roles and responsibilities
RAPs	Provide cultural perspectives, views, knowledge and advice to EMM. Indicate areas of cultural significance. Provide Aboriginal sites representatives for archaeological fieldwork (if desired and suitably qualified and insured). Have an awareness and understanding of the commercial environment and constraints in which the proponent operates. Demonstrate awareness and understanding of the opportunities to provide input into the ACHA and management recommendations. Identify, raise, and discuss cultural concerns, perspectives and assessment requirements (if any).
EMM	Undertake the ACHA, including coordinating and directing the fieldwork. Facilitate the Aboriginal consultation process. Consider the cultural perspectives, views, knowledge and advice of the RAPs in assessing cultural significance and developing management measures. Provide clear management measures that comply with relevant legislation, guidelines and significance.
All parties	Mutual respect (each person has the right to have a say and be heard). Communicate in a professional manner.

4 Assessment methodology

4.1 Overview

Given the assessment of the development under Part 4, Division 4.7 of the EP&A Act as State significant development, additional approvals required under the *National Parks and Wildlife Act 1974* do not apply. The ACHA addendum will be updated with reference to relevant guidelines, policies and industry requirements, and following consultation with stakeholders, including relevant government agencies and the community. Aboriginal heritage will be assessed and managed in accordance with the following guidelines:

- *Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW* (the Code) (DECCW 2010a)
- *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (DECCW 2010b)
- *Aboriginal Consultation Requirements for Proponents 2010* (DECCW 2010c).

The purpose of the assessment is to identify and manage the Aboriginal cultural heritage sites and values within the modification area. These will be integrated into an addendum to the current ACHA that considers the previous project areas and the modification area. In summary, this will involve:

- consultation with the Aboriginal stakeholders to identify socio-cultural values of the study area and places of special significance that should be considered within the modification
- a search of the AHIMS register for records of previously registered Aboriginal sites focusing on the modification area
- a review of past Aboriginal heritage reports covering the modification area
- environmental landscape analysis to identify past Aboriginal resources and suitable occupation areas within the modification area
- synthesis of background research to develop a predictive model of Aboriginal site location within the modification area
- field investigation to validate the findings of the desktop assessment and identify any previously undocumented cultural material within the modification area. This will include surface inspection and may extend to test excavations of areas of archaeological interest if required
- an assessment of significance for Aboriginal cultural heritage values in the modification area (with input from the registered Aboriginal stakeholders)
- where required, an impact assessment of how the modification will affect Aboriginal cultural heritage values in the modification area
- development of management recommendations based on the results of the assessment and input from registered Aboriginal stakeholders during the consultation process and particularly from the draft ACHA review period.

4.2 Archaeological survey

Archaeological survey of the modification area will be undertaken to identify any extant Aboriginal objects or sites. Surface investigation will consist of the survey team evenly spaced (10–20 m apart) walking transects across accessible parts of the modification area. Given the small size, it is expected that the entire modification area would be investigated as part of the survey. All Aboriginal objects and/or landforms of interest will be mapped and documented using hand-held GPS, photographs, sketches and/or written description. Where possible, a significant focus of the survey will be to discuss intangible values associated with the area, such as connection to other cultural places, stories, view-lines, contemporary values, etc. The survey will be undertaken in accordance with Requirements 5 to 10 of the Code of Practice. In summary, the Code of Practice requires the following general methodology:

- pedestrian survey
- survey and recording according to survey unit and/or transect
- recording of beginning and end points of transects or the boundaries of survey units, and the spacing between survey personnel
- recording of landform, soil information, land surface, vegetation conditions, visibility and exposure, and survey coverage

- recording of any identified Aboriginal sites identified according to Requirements 6–8, and recording of any identified Aboriginal objects in accordance with Requirements 18–24 of the Code of Practice
- if any Aboriginal objects and/or sites are identified in the course of the survey, site cards will be completed and submitted to the AHIMS registrar
- in the event of Aboriginal heritage being identified within the modification area, undertake discussions on site as to the potential further investigation and/or management of these finds.

4.3 Test excavations

At this stage it is unclear if test excavations would be required. Previous test excavations have revealed limited evidence of buried cultural material in a shallow soil profile. If test excavations are determined to be needed during the field survey, they would adopt the Heritage NSW Code of Practice methods and be consistent with the test excavation methodology already undertaken for the existing ACHA. In summary:

- all test excavations would be established as a grid across areas of archaeological interest. These would either represent linear transects of evenly spaced test pits (generally 20–40 m apart) across landforms of interest, such as alluvial terraces, floodplains, etc; and/or a more systematic grid of test pits (e.g. 20 x 20 or 40 x 40 m spacing) focussed on areas of archaeological sensitivity
- all test excavation pits would be spatially located using a differential GPS device, which would also provide elevation data
- manual excavation of 0.25 m^2 (50 x 50 cm) test pits, with potential to expand up to 3 m^2 where substantive cultural materials or features are encountered
- excavation would use hand tools. Excavation of the first unit would be in 5 cm spits, with subsequent excavation allowed in 10 cm spits or according to stratigraphy (whichever is smallest) depending on the results of the first unit. Manual excavation would continue to either:
    - i) the base of the cultural deposits;
    - ii) to the depth of the underlying geology; or
    - iii) to the maximum depth possible via hand excavation (likely ~50 cm).
- sieving of all manually excavated material through a 5-mm sieve
- reduced levels of the top and bottom of the test pit would be documented using a dumpy level against a known elevation – other levels may be taken as required
- soil profiles would be recorded in accordance with the Code of Practice, including scaled drawings, photographs, and written descriptions
- soil samples may be collected for description, sedimentological and chronological analysis where such analysis is considered likely to contribute significant information; and excavation procedures and protocols may be modified at the discretion of the Excavation Director, in consultation with the Aboriginal stakeholders and the proponent as the conditions in the field and nature of the excavations develop. This includes the movement of test pits to avoid existing built structures, buried services and disturbances not identified during the desktop phase.

Following the field survey, EMM will consult with Gunlake about the survey results and whether archaeological test excavations are proposed. If test excavation is pursued, RAPs will be provided with at least two weeks' notice about the indicative location(s) and scope of the proposed excavation program. RAPs will be welcome to

comment on the indicative program prior to the commencement of the program, and amendments may be made to the program where reasonable and feasible.

4.3.1 Artefact curation

Should test excavations be required and cultural materials recovered, they would temporarily be curated by EMM at our Sydney office. The cultural materials would be subject to specialist non-invasive analysis and be available for viewing by RAPs at any time.

The long-term management of the artefacts will align with the procedures outlined in the ACHMP, which identified artefact reburial in proximity to previously reburied cultural materials identified as GL123 (#51-6-0750) and receive the same active protection. The reburial procedure will follow the stone artefact disposition procedures as set out in Section 3.7 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010).

4.4 Timeframes

The following indicative timeframes would apply:

- Distribution of this document to registered Aboriginal stakeholders: **August 2015**
- Field survey of the additional areas: **September 2025**
- Distribution of the updated draft ACHA report for RAP review and comment: **October 2025**
- Input into recommendations and review of updated draft report by RAPs: **November 2025**
- Report finalisation: **December 2025**

5 What we need from you

In addition to the archaeological evidence described above, Aboriginal heritage incorporates a wide range of values such as stories, traditions and cultural practices. EMM welcomes advice from the Aboriginal community about cultural values (which might include archaeological sites or other types of values) relevant to the modification area and its surrounds. EMM is relying on the Aboriginal community for advice on nonarchaeological and intangible Aboriginal values for the modification area. We are happy to discuss any information which you are willing to share and will respect confidentiality where requested.

EMM would appreciate your feedback on the above methodology proposed for the investigation and assessment of the modification area. In responding, please also consider the following questions:

- Are there any protocols in relation to community interaction and/or cultural heritage that you would like adopted during the project?
- Are you aware of any Aboriginal objects, places, sites or stories of cultural significance and/or importance that you are aware of within the modification area? If so, please advise us how you wish them to be dealt with during the project.
- Are you aware of any past or current fishing and hunting activities within the modification area? Do you have any views on how these should be managed into the future?
- Is the information you are providing sensitive, gender specific, etc? If so, how would you like the information you provide to EMM to be managed? Noting that some documentation for the ACHA process will be required.

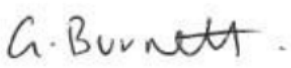
- Do you require any further information prior to EMM proceeding with the updated ACHA investigations?
- In your response, can you please also clearly identify who you would like EMM to talk to within your organisation, and provide contact details for these individuals. Please also ensure your preferred method of communication (e.g. telephone call, e-mail, letter etc) is highlighted for subsequent stages of the project.

6 Closing

We look forward to receiving any response your organisation wishes to make about the proposed method by **COB 26 September 2025**. Your response will be documented and considered in the assessment.

Please feel free to contact me with any questions.

Yours sincerely



Georgia Burnett
Senior archaeologist
gburnett@emmconsulting.com.au

7 References

Australian Archaeological Survey Consultants (AASC). (2008). *Proposed Hard Rock Quarry Marulan NSW - Preliminary Archaeological Assessment*.

EMM Consulting Pty Ltd (EMM). (2016). *Gunlake Quarry Extension Project - Aboriginal Cultural Heritage Assessment*. www.emmconsulting.com.auu

Cultural Heritage Management Australia (CHMA). (2014). *Gunlake Quarry, Marulan NSW -Modification to Quarry Pit and Overburden Emplacement - Aboriginal Cultural Heritage Assessment*.

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

Gunlake Quarry (2025) Aboriginal Cultural Heritage Management Plan Gunlake Quarry. Unpublished report prepared for Gunlake Quarry.

Angus Lynch

From: Angus Lynch
Sent: Friday, 29 August 2025 9:29 AM
Cc: Georgia Burnett; Alan Williams
Subject: Gunlake Quarry Continuation Project MOD3 - Proposed Assessment Methods
Attachments: E230595_Assessment methods_v1.pdf

Bcc: [redacted]

Dear all,

We are contacting you in regards to your previous consultation engagement regarding Gunlake Quarry, located at 715 Brayton Road, just north of Marulan 2579 NSW. As you may be aware, Aboriginal consultation and site investigations relating to the original quarry project, as well as the Extension and Continuation Projects, have been undertaken since 2007. This includes the original assessment activities in 2007, an Aboriginal cultural heritage assessment (ACHA) for Continuation Project and the Extension Project that incorporated both field survey and, for the Extension project, test excavations between 2014 and 2016, as well as the development of an Aboriginal cultural heritage management plan (ACHMP) for the project in 2018. Other activities have included the implementation of the ACHMP requirements, such as the fencing of sites and artefact recovery, as well as various updates of the plan in recent years to support the Extension and Continuation Projects through late 2023/early 2024 and in early 2025.

Gunlake Quarry is now applying to modify the Continuation Project to allow for the expansion of the Western Overburden Emplacement (Figure 1.2 in the attached letter). No other changes to the quarry have been proposed. As part of investigations to inform a Modification Report for the project, Gunlake Quarry has engaged EMM to prepare an addendum to the existing ACHA. This will include an assessment of any cultural heritage objects and/or values, if present, within the proposed extension of the Western Overburden Emplacement (the 'modification area'), and where needed, determining any potential impacts, and developing suitable Aboriginal cultural heritage management strategies.

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Please let me know if you require any further information, happy to discuss.

Kind regards,

Angus Lynch
Archaeologist – Aboriginal Archaeology

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Angus Lynch

From: Angus Lynch
Sent: Friday, 5 September 2025 3:44 PM
Cc: Georgia Burnett; Alan Williams
Subject: RE: Gunlake Quarry Continuation Project MOD3 - Proposed Assessment Methods
Attachments: ACHA008_ProposedTestPits_20250903_01.pdf; E230595_Assessment methods_v1.pdf

Bcc: [redacted]

Hi all,

Thank you again for your ongoing engagement regarding Gunlake Quarry. I am writing to provide an update on the assessment methods for the ACHA for the extension of the Western Overburden Emplacement (see the email below for further detail).

As outlined in the letter provided to you last week, we identified the potential need for test excavations (reattached to this email for your convenience). In consultation with the client, it is our intention to carry out test excavations to further characterise the Aboriginal heritage potential of the modification area. The intent here is to explore the edges of previously identified site GL14a-d, and whether this site extends northeast from its identified extent. The attached map shows the proposed layout of these test pits within the modification area, the proposed work would align with the methods presented in the letter. To align with the timeframes of the project, this work would be planned to follow directly after the survey program.

We welcome your feedback on this update and ask any comments to be received by COB 26 September 2025. We will be in touch in the coming weeks regarding the field program.

Kind regards,

Angus Lynch Graduate Archaeologist
Ecology & Heritage – Aboriginal Heritage

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M 0434 721 728

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I work flexibly. I'm sending you this message now because it's a good time for me, but do not expect you to read, respond or action it outside your regular hours.

From: Angus Lynch
Sent: Friday, 29 August 2025 9:29 AM
Cc: Georgia Burnett <gburnett@emmconsulting.com.au>; Alan Williams <awilliams@emmconsulting.com.au>
Subject: Gunlake Quarry Continuation Project MOD3 - Proposed Assessment Methods

Dear all,

We are contacting you in regards to your previous consultation engagement regarding Gunlake Quarry, located at 715 Brayton Road, just north of Marulan 2579 NSW. As you may be aware, Aboriginal consultation and site investigations relating to the original quarry project, as well as the Extension and Continuation Projects, have been undertaken since 2007. This includes the original assessment activities in 2007, an Aboriginal cultural heritage assessment (ACHA) for Continuation Project and the Extension Project that incorporated both field survey and, for the Extension project, test excavations between 2014 and 2016, as well as the development of an Aboriginal cultural heritage management plan (ACHMP) for the project in 2018. Other activities have included the implementation of the ACHMP requirements, such as the fencing of sites and artefact recovery, as well as various updates of the plan in recent years to support the Extension and Continuation Projects through late 2023/early 2024 and in early 2025.

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Kind regards,

Angus Lynch
Archaeologist – Aboriginal Archaeology

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Angus Lynch

From: [redacted]
Sent: Friday, 29 August 2025 5:43 PM
To: Angus Lynch
Subject: Re: Gunlake Quarry Continuation Project MOD3 - Proposed Assessment Methods

Hi Angus
I have read the project information and draft ACHA for the above project, I endorse the recommendations.
Kind regards
[redacted]

On Friday 29 August 2025 at 09:28:45 am AEST, Angus Lynch <alynch@emmconsulting.com.au> wrote:

Dear all,

We are contacting you in regards to your previous consultation engagement regarding Gunlake Quarry, located at 715 Brayton Road, just north of Marulan 2579 NSW. As you may be aware, Aboriginal consultation and site investigations relating to the original quarry project, as well as the Extension and Continuation Projects, have been undertaken since 2007. This includes the original assessment activities in 2007, an Aboriginal cultural heritage assessment (ACHA) for Continuation Project and the Extension Project that incorporated both field survey and, for the Extension project, test excavations between 2014 and 2016, as well as the development of an Aboriginal cultural heritage management plan (ACHMP) for the project in 2018. Other activities have included the implementation of the ACHMP requirements, such as the fencing of sites and artefact recovery, as well as various updates of the plan in recent years to support the Extension and Continuation Projects through late 2023/early 2024 and in early 2025.

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Please let me know if you require any further information, happy to discuss.

Kind regards,

Angus Lynch
Archaeologist – Aboriginal Archaeology

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Angus Lynch

From: [redacted]
Sent: Wednesday, 10 September 2025 11:00 AM
To: Angus Lynch
Cc: Alan Williams; Georgia Burnett
Subject: Re: Gunlake Quarry Continuation Project MOD3 - Proposed Assessment Methods

Dear Angus,

Thank you for forwarding the project information and assessment methodology for the proposed Modification #3 to the Gunlake Quarry Continuation Project. We acknowledge receipt of the documentation and appreciate the opportunity to provide input into this process.

This project area sits within both [redacted]. As a [redacted], I wish to highlight the following values and considerations relevant to the modification area and its surrounds:

1. **Connection to Country**
   The landscape around Marulan, including Brayton Road and associated waterways such as Chapman's Creek and Joarimin Creek, is part of a broader cultural system. Country in this area holds meaning beyond physical artefacts, it is embedded with pathways (*mura*), stories, and seasonal knowledge that continue to inform cultural identity today.
2. **Cultural Values (Tangible and Intangible)**
   Tangible values include stone artefacts, archaeological sites, and physical features of the land. Intangible values include cultural stories, view-lines, connections to watercourses and ridgelines, and the continuing spiritual significance of Country. Both forms of value must be considered together, as they cannot be separated in cultural terms.
3. **Artefact Reburial and Cultural Care**
   We note that the Aboriginal Cultural Heritage Management Plan (ACHMP), first implemented in 2018 and updated in subsequent years, provides the foundation for managing cultural heritage at Gunlake Quarry. Any new investigations and management strategies under Modification #3 should remain consistent with the ACHMP commitments, particularly around salvage, reburial, and Aboriginal involvement in monitoring and decision-making.
4. **Protocols During Fieldwork**
   We ask that experienced Traditional Cultural Site Officers from the Registered Aboriginal Parties are engaged during surveys and, if required, test excavations. As [redacted], we have previously been involved in fieldwork at the quarry, and we expect this involvement to continue so that both tangible and intangible cultural values are recognised at the time of discovery and that decisions reflect our responsibilities to Country.
5. **Ongoing Partnership**
   Continued consultation with the [redacted] groups is essential, not only for compliance but also for ensuring that cultural voices shape how the land is treated as operations expand. We welcome continued collaboration to safeguard the cultural heritage of this Country.

Kind regards,

[redacted]
0413 186 133

I acknowledge the Ngunawal people as the Traditional Custodians of the Country on which the Gunlake Quarry is situated. I pay my respects to our Elders past and present, and acknowledge our continuing connection to land, waters, culture, and community.

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On Fri, Aug 29, 2025 at 9:28 AM Angus Lynch <alynch@emmconsulting.com.au> wrote:

Dear all,

We are contacting you in regards to your previous consultation engagement regarding Gunlake Quarry, located at 715 Brayton Road, just north of Marulan 2579 NSW. As you may be aware, Aboriginal consultation and site investigations relating to the original quarry project, as well as the Extension and Continuation Projects, have been undertaken since 2007. This includes the original assessment activities in 2007, an Aboriginal cultural heritage assessment (ACHA) for Continuation Project and the Extension Project that incorporated both field survey and, for the Extension project, test excavations between 2014 and 2016, as well as the development of an Aboriginal cultural heritage management plan (ACHMP) for the project in 2018. Other activities have included the implementation of the ACHMP requirements, such as the fencing of sites and artefact recovery, as well as various updates of the plan in recent years to support the Extension and Continuation Projects through late 2023/early 2024 and in early 2025.

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you would like to share, you're welcome to provide this within this timeframe or up until completion of the draft ACHA. Please provide any responses by **COB 26 September 2025**.

Please let me know if you require any further information, happy to discuss.

Kind regards,

Angus Lynch
Archaeologist – Aboriginal Archaeology

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Angus Lynch

From: Angus Lynch
Sent: Friday, 12 September 2025 10:06 AM
To: [redacted]
Cc: Alan Williams; Georgia Burnett; Taylar Reid
Subject: RE: Gunlake Quarry Continuation Project MOD3 - Proposed Assessment Methods

Dear Dean,

Thank you for your timely response and providing your considerations about the Gunlake Quarry Modification Project. We will be in touch over the coming weeks with more information regarding the project's progression and how you can be involved.

Kind regards,

Angus Lynch Graduate Archaeologist
Ecology & Heritage – Aboriginal Heritage

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M 0434 721 728
www.emmconsulting.com.au

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From: [redacted]
Sent: Wednesday, 10 September 2025 11:00 AM
To: Angus Lynch <alynch@emmconsulting.com.au>
Cc: Alan Williams <awilliams@emmconsulting.com.au>; Georgia Burnett <gburnett@emmconsulting.com.au>
Subject: Re: Gunlake Quarry Continuation Project MOD3 - Proposed Assessment Methods

Dear Angus,

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This project area sits within both Ngunawal and Gundungurra Country. As a [redacted], I wish to highlight the following values and considerations relevant to the modification area and its surrounds:

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Kind regards,

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Please let me know if you require any further information, happy to discuss.

Kind regards,

Angus Lynch
Archaeologist – Aboriginal Archaeology

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Angus Lynch

From: [redacted]
Sent: Sunday, 21 September 2025 6:23 PM
To: Angus Lynch; kirsty@gunlake.com.au
Subject: Re: Gunlake Quarry Continuation Project MOD3 - Proposed Assessment Methods
Attachments: ACHA008_ProposedTestPits_20250903_01.pdf; E230595_Assessment methods_v1.pdf

Hi Kirsty
I have read the project information and proposed assessment methods for the above project, I endorse the recommendations.
Kind regards
[redacted]

On Friday 5 September 2025 at 03:44:29 pm AEST, Angus Lynch <alynch@emmconsulting.com.au> wrote:

Hi all,

Thank you again for your ongoing engagement regarding Gunlake Quarry. I am writing to provide an update on the assessment methods for the ACHA for the extension of the Western Overburden Emplacement (see the email below for further detail).

As outlined in the letter provided to you last week, we identified the potential need for test excavations (reattached to this email for your convenience). In consultation with the client, it is our intention to carry out test excavations to further characterise the Aboriginal heritage potential of the modification area. The intent here is to explore the edges of previously identified site GL14a-d, and whether this site extends northeast from its identified extent. The attached map shows the proposed layout of these test pits within the modification area, the proposed work would align with the methods presented in the letter. To align with the timeframes of the project, this work would be planned to follow directly after the survey program.

We welcome your feedback on this update and ask any comments to be received by COB 26 September 2025. We will be in touch in the coming weeks regarding the field program.

Kind regards,

Angus Lynch Graduate Archaeologist
Ecology & Heritage – Aboriginal Heritage

T 02 9493 9500

M 0434 721 728

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From: Angus Lynch
Sent: Friday, 29 August 2025 9:29 AM
Cc: Georgia Burnett <gburnett@emmconsulting.com.au>; Alan Williams <awilliams@emmconsulting.com.au>
Subject: Gunlake Quarry Continuation Project MOD3 - Proposed Assessment Methods

Dear all,

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Please let me know if you require any further information, happy to discuss.

Kind regards,

Angus Lynch
Archaeologist – Aboriginal Archaeology
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Angus Lynch

From: Georgia Burnett
Sent: Tuesday, 16 September 2025 3:52 PM
To: OEH HD Heritage Mailbox
Cc: Angus Lynch; Alan Williams; Taylar Reid
Subject: Gunlake Quarry - MOD3 - Notification of the commencement of test excavations
Attachments: E230595_Assessment methods_v1.pdf; ACHA008_ProposedTestPits_20250903_01.pdf; RE: Gunlake Quarry Continuation Project MOD3 - Proposed Assessment Methods

Follow Up Flag: Follow up
Flag Status: Completed

Dear ACH team,

In accordance with the Requirement 15 of the *Code of Practise for Archaeological Investigations of Aboriginal Objects in NSW*, we wish to advise that EMM Consulting Pty Ltd is proposing to undertake the Aboriginal archaeological test excavations as part of the Aboriginal Cultural Heritage Assessment being prepared for a modification to the Gunlake Quarry Continuation Project at Marulan. These works will commence on Wednesday 1 October 2025 and comprise 2 business days, concluding Thursday 2 October 2025, though this may extend slightly depending on findings.

Contact information for proponent and EMM, and location information, are outlined in the attached documentation. This letter was provided to the RAPs for comment on 29 August 2025, with a 28-day comment period, and an update regarding specifics around the test excavation was provided on 5 September. As outlined in the letter (Section 4.3.1), any Aboriginal objects would be temporarily stored in EMM's Sydney office (address below), and the long-term management of the artefacts will align with the procedures outlined in the ACHMP (Gunlake Quarry 2025).

Happy to discuss.

Kind regards,
Georgia

Georgia Burnett
Senior Archaeologist
EMM creating opportunities
T 02 9493 9500
M 0459 295 806
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emmconsulting.com.au
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Georgia Burnett

From: Alison Lamond (Heritage NSW) <support@zendesk.environment.nsw.gov.au>
Sent: Thursday, 25 September 2025 10:58 AM
To: Georgia Burnett
Subject: Request #60558 has been updated: Gunlake Quarry - MOD3 - Notification of the commencement of test excavations

Your request has been updated. To add additional comments, reply to this email.

Hello Georgia

Thank you for sending through the notification of proposed test excavations, this has been saved to the project file accordingly.

Your reference: DOC25/821010

Thanks and kind regards,

Alison Lamond
Heritage NSW
Department of Climate Change, Energy, the Environment and Water (DCCEEW)
T: 02 9873 8500 E: heritagemailbox@environment.nsw.gov.au
https://www.environment.nsw.gov.au/topics/heritage
Locked Bag 5020 Parramatta, NSW 2124
Monday to Friday, 09:00am - 05:00pm

Website | Facebook | Instagram | LinkedIn

We acknowledge the traditional custodians of the lands and seas upon which we work, walk and live and pay respects to Elders past present and emerging.
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On 16 September 2025 at 5:52:41 am UTC, Georgia Burnett gburnett@emmconsulting.com.au wrote:

> Dear ACH team,
>
> In accordance with the Requirement 15 of the *Code of Practise for Archaeological Investigations of Aboriginal Objects in NSW*, we wish to advise that EMM Consulting Pty Ltd is proposing to undertake the Aboriginal archaeological test excavations as part of the Aboriginal Cultural Heritage Assessment being prepared for a modification to the Gunlake Quarry Continuation Project at Marulan. These works will commence on Wednesday 1 October 2025 and comprise 2 business days, concluding Thursday 2 October 2025, though this may extend slightly depending on findings.

Contact information for proponent and EMM, and location information, are outlined in the attached documentation. This letter was provided to the RAPs for comment on 29 August 2025, with a 28-day comment period, and an update regarding specifics around the test excavation was provided on 5 September. As outlined in the letter (Section 4.3.1), any Aboriginal objects would be temporarily stored in EMM's Sydney office (address below), and the long-term management of the artefacts will align with the procedures outlined in the ACHMP (Gunlake Quarry 2025).

Happy to discuss.

Kind regards,
Georgia

Georgia Burnett
Senior Archaeologist



T 02 9493 9500
M 0459 295 806
LI Connect on LinkedIn
emmconsulting.com.au

SYDNEY | Gamaraigal Country, The Forum, Level 10, 201 Pacific Highway, St Leonards NSW 2065



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B.5 Stage 4 – Aboriginal feedback of the draft ACHA

Phillipa O'Brien-Pounde

From: Phillipa O'Brien-Pounde
Sent: Wednesday, 22 October 2025 2:06 PM
Cc: Georgia Burnett; Alan Williams
Subject: Gunlake MOD3 - Draft ACHA for final review

Bcc: [redacted]

Hi all,

Thank you again for your ongoing engagement regarding the proposed modification at Gunlake Quarry, and associated Aboriginal cultural assessment being undertaken. We are pleased to inform you that the draft report has been completed, and we are in a position to be able to provide this document to you and your organisation for review and input.

As you will be aware, Gunlake Quarries Pty Ltd is seeking approval to modify the Gunlake Quarry Continuation Project to expand the Western Emplacement area. This modification does not involve changes to other quarry operations. Extensive Aboriginal cultural heritage investigations have been undertaken since 2008, resulting in the identification of 18 Aboriginal sites within the project area. Of these, two artefact scatter sites – GL14a and GL14c – were previously recorded as extending into the proposed modification area. However, largely due to previous salvage activities which have collected these sites, these sites are now considered destroyed and no longer extant.

Recent field investigations, including survey and test excavations, did not identify any new surface or subsurface cultural materials. One mature Stringybark eucalypt (GL-AT1) was identified by a Registered Aboriginal Party as having cultural significance. This tree is located within the centre of the proposed development footprint and will be impacted by the modification. It has been documented as a cultural site and is recommended for on-Country relocation. Outside of this, the modification is assessed as posing a low risk to Aboriginal heritage. Key recommendations of the assessment include updating the Aboriginal Heritage Information Management System (AHIMS) and the existing Aboriginal Cultural Heritage Management Plan (ACHMP), and implementing appropriate protocols for managing GL-AT1 in consultation with Aboriginal stakeholders.

The report can be downloaded here for your review: Gunlake Quarry MOD3

We would greatly appreciate your review and any inputs you or your organisation may have in relation to the report, especially the findings, significance and recommendations. Can you please provide this feedback by **Wednesday 19 November 2025**.

If you have any problems downloading or accessing the report, or want to chat about the report further, please feel free to email or call to discuss (contact details below). Also, if you require a printed copy posted to you, please let myself or Al know (and provide postal information) and we can arrange this for you.

Kind regards,

Phillipa

Phillipa O'Brien-Pounde
Archaeologist – Aboriginal Heritage

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T 02 9493 9500
M 0434 441 477
LI Connect on LinkedIn
emmconsulting.com.au

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Outlook

Re: Gunlake MOD3 - Draft ACHA for final review

From Phillipa O'Brien Pounde <pobrienpounde@emmconsulting.com.au>
Date Wed 2025-11-12 10:39 AM
Cc Georgia Burnett <gburnett@emmconsulting.com.au>; Alan Williams <awilliams@emmconsulting.com.au>
Bcc [redacted]

Hi all,

This is just a friendly reminder that the Gunlake Quarry Continuation Project Modification 3 ACHA review period ends next week on **Wednesday 19 November 2025**. If you haven't already, any feedback prior to this date would be greatly appreciated.

If you have any comments or questions please don't hesitate to reach out to Alan Williams (cc'd) or myself.

Kind regards,

Phillipa O'Brien-Pounde
Archaeologist – Aboriginal Heritage

T 02 4907 4881
M 0434 441 477
www.emmconsulting.com.au

From: Phillipa O'Brien-Pounde
Sent: Wednesday, October 22, 2025 2:06 PM
Cc: Georgia Burnett <gburnett@emmconsulting.com.au>; Alan Williams <awilliams@emmconsulting.com.au>
Subject: Gunlake MOD3 - Draft ACHA for final review

Hi all,

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pleased to inform you that the draft report has been completed, and we are in a position to be able to provide this document to you and your organisation for review and input.

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The report can be downloaded here for your review: Gunlake Quarry MOD3

We would greatly appreciate your review and any inputs you or your organisation may have in relation to the report, especially the findings, significance and recommendations. Can you please provide this feedback by **Wednesday 19 November 2025**.

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Kind regards,

Phillipa

Phillipa O'Brien-Pounde
Archaeologist – Aboriginal Heritage

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Appendix C

Additional archaeological information

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C.1 Site definitions and recording methods used for this assessment

C.1.1 Aboriginal sites

In the AHIMS database, Aboriginal sites are defined in several ways. At the simplest level, sites are recorded as 'closed' or 'open'. Closed sites are associated with rockshelters and include other evidence of Aboriginal occupation that may be present, such as areas where subsurface Aboriginal objects may occur within the shelter ('potential archaeological deposit' (PAD)), faunal remains, and art on the shelter walls (paintings/engravings). Open sites are broadly defined and encompass all other types of Aboriginal site features that are located in areas where there is no rockshelter. The most common open site features found generally include artefacts, grinding grooves, art, culturally modified trees, and shell deposits (middens) (OEH 2012). The presence or absence of stone artefacts is often a defining factor in site identification, with almost every site likely to have at least some associated artefacts, as discard or loss of this most ubiquitous and practically indestructible marker of past Aboriginal visitation.

Any one site (or group of linked sites described as a 'complex') can contain several different site features. For example, a shelter may have art on the walls, artefacts on the floor surface or outside the shelter, and be predicted to contain faunal remains and further artefacts in the accumulated deposit inside.

A description of terms used to describe different site features known to occur in the vicinity of the project area is provided in Table C.1 and use definitions provided by OEH and those adopted by EMM in their field investigations to ensure consistency in recording. Similarly, there may be places of contemporary significance to Aboriginal people in the region and that will require consultation with this community to identify.

Table C.1 Site definitions and recording

Site feature	Definition and recording methods
Aboriginal ceremony and Dreaming	Previously referred to as mythological sites these are spiritual/story places where no physical evidence of previous use of the place may occur; e.g. natural unmodified landscape features, ceremonial or spiritual areas, men's/women's sites, dreaming (creation) tracks, marriage places etc.
Artefact site (open stone artefact site)	Objects such as stone tools, and associated flaked material, spears, manuports, grindstones, discarded stone flakes, modified glass or shell demonstrating evidence of use of the area by Aboriginal people. Open stone artefact sites were defined by the presence of one (isolated find) or more (artefact scatter) stone artefacts visible on the ground surface. The boundaries of a site are limited to the spatial extent of the visible stone artefacts. The mapped site points and/or 'site areas' do not represent the areas of potential archaeological deposit (PAD) that also apply to some sites (refer to the term 'PAD' below). Open stone artefact sites were recorded by marking each artefact location or each cluster of artefacts within a 5 m radius as a separate waypoint in the GPS. Site boundaries were allocated by drawing a line around the cluster waypoints for each site using ArcGIS software. Stone artefacts more than 50 m apart were recorded as separate sites. EMM acknowledges that the 50 m rule applied here is an arbitrary distinction for site boundaries and is used mainly for efficiencies in site management and to establish consistency in site recording methods.
Burials	A traditional or contemporary (post-contact) burial of an Aboriginal person, which may occur outside designated cemeteries and may not be marked e.g. in caves, marked by stone cairns, in sand areas, along creek banks etc.
Fish trap	A modified area on watercourses where fish were trapped for short-term storage and gathering.

Site feature	Definition and recording methods
Grinding grooves	Grinding grooves were defined as an area of outcropping bedrock containing evidence of one or more grinding grooves where ground-stone hatchets or other grinding practices (i.e. seed grinding) were implemented.
Habitation structure	Structures constructed by Aboriginal people for short- or long-term shelter. More temporary structures are commonly preserved away from the NSW coastline, may include historic camps of contemporary significance. Smaller structures may make use of natural materials such as branches, logs and bark sheets or manufactured materials such as corrugated iron to form shelters. Archaeological remains of a former structure such as chimney/fireplace, raised earth building platform, excavated pits, rubble mounds etc.
Modified tree (carved or scarred)	Trees which show the marks of modification as a result of cutting of bark from the trunk for use in the production of shields, canoes, boomerangs, burials shrouds, for medicinal purposes, foot holds etc., or alternately intentional carving of the heartwood of the tree to form a permanent marker to indicate ceremonial use/significance of a nearby area, again these carvings may also act as territorial or burial markers. Modified trees (either carved or scarred) can be difficult to identify. Scars commonly occur on trees through natural processes such a branch tears, insect damage, storm and fire damage and faunal damage. Scars can also occur from mechanical damage from vehicles or farming equipment. The attributes of potential scarred trees were discussed during the survey amongst archaeologists and RAPs before it was decided if a scar would be recorded or not. A precautionary approach was adopted, whereby some of the more ambiguous examples were recorded anyway. The assessment of scar trees was made from the experience of the survey team and the guideline *Aboriginal scarred trees in New South Wales: a field manual* (DEC 2005). In some of the more ambiguous examples, it cannot be verified whether some scars recorded during the survey are of natural or Aboriginal origin. In such instances, an expert evaluation by a scar tree expert (aborist or other) would be required to determine the status of certain trees.

Site feature	Definition and recording methods
Potential archaeological deposit (PAD)	An area where Aboriginal objects may occur below the ground surface. The term 'potential archaeological deposit' was first applied in Sydney regional archaeology in the 1980s, and referred to rockshelters that were large enough and contained enough accumulated deposit to allow archaeologists to predict that subsurface cultural material was likely to be present. Since then, the term has come to include open sites where the same prediction can be made. EMM has defined PADs as the predicted extent of concentrated subsurface Aboriginal objects in a particular area. PADs are not technically Aboriginal sites until, and if, subsurface Aboriginal objects are identified, which is typically established through archaeological test excavation. PAD areas have been assigned to landforms that are distinguishable from the surrounding landscape (e.g. elevated areas with good outlook overlooking watercourses) as being likely to retain higher artefact densities than the assumed 'background scatter' of archaeological material in the broader landscape. The identification of PADs associated with Aboriginal open camp sites was partly based on observations in the field and discussions with RAPs, but also related to the predictive model. Although PAD was attributed to areas for a variety of reasons, the main qualifiers were: The presence of surface artefacts or other Aboriginal objects. Ground surface visibility as part of the archaeological survey effort was typically considered high enough in each PAD area to identify at least one or more surface artefacts thereby indicating likelihood of subsurface potential. Notwithstanding, finding no visible surface artefacts in an area would not disqualify an area from being attributed with PAD. Level to gently inclined ground (<10%) indicating suitable camping or activity areas. Contours that distinguish the landforms with PAD from the surrounding landscape (e.g. spur crest, hill crest or knoll). Landform boundaries were also interpreted through observations in the field. Notably, rocky crest landforms that were protected from intensive cultivation were often attributed with PAD. Proximity to water: typically up to 100 m from 1st and 2nd order streams and up to 200 m from 3rd order streams and above. Elevated landforms at the confluence of higher order streams were also more likely to be attributed with PAD. EMM acknowledges that all PAD areas have been historically cleared of native vegetation and some have been subject to pasture improvements such as ploughing. As such, the term PAD does not assume high subsurface integrity; instead it is a prediction of potential subsurface artefact concentrations. All stone quarry sites are predicted to have PAD. The assumption is that in most cases the visible surface material at quarries is represented by larger artefacts (such as cores) and that smaller material (e.g. flakes) is likely to be buried.
Restricted	Site information contained in the Aboriginal Heritage Information Management System is available only to certain authorised groups of people, as requested by the Aboriginal community. Detailed information may not be available in search reports.
Shell	An accumulation or deposit of shellfish from beach, estuarine, lacustrine or riverine species resulting from Aboriginal gathering or consumption. Usually found in deposits previously referred to as shell middens. Must be found in association with other objects like stone tools, fish bones, charcoal, fireplaces/hearths, and burials. Will vary greatly in size and composition.
Stone quarry	Usually a source of good quality stone which is quarried and used for the production of stone tools. Stone quarries represent where Aboriginal people gathered raw stone materials for stone tools and/or manufactured stone tools from the adjacent source material. Quarry sites are found at rock outcrops where the material was of suitable quality to have been used to manufacture stone tools. Stone quarries were defined by the presence of outcropping stone material with nearby evidence of the same material type used in the stone tool manufacture process. This was most commonly indicated by large stone cores or stone flakes distributed amongst the same naturally outcropping material. EMM acknowledges that the 'open stone artefact' site type shares some of the same characteristics as 'stone quarries', such as the presence of stone artefacts. However, they have been distinguished from each other because quarries can not only represent open camping activities, but also a fixed location where Aboriginal people needed to visit to extract a resource. In contrast, the location of typical open camp sites were not fixed, but chosen by Aboriginal people for their favourable conditions.

C.2 AHIMS search results

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : E230595.6

Client Service ID : 1037252

EMM Consulting - Individual users

Ground Level, Suite 01 20 Chandos Street
St Leonards New South Wales 2065

Attention: Angus Lynch

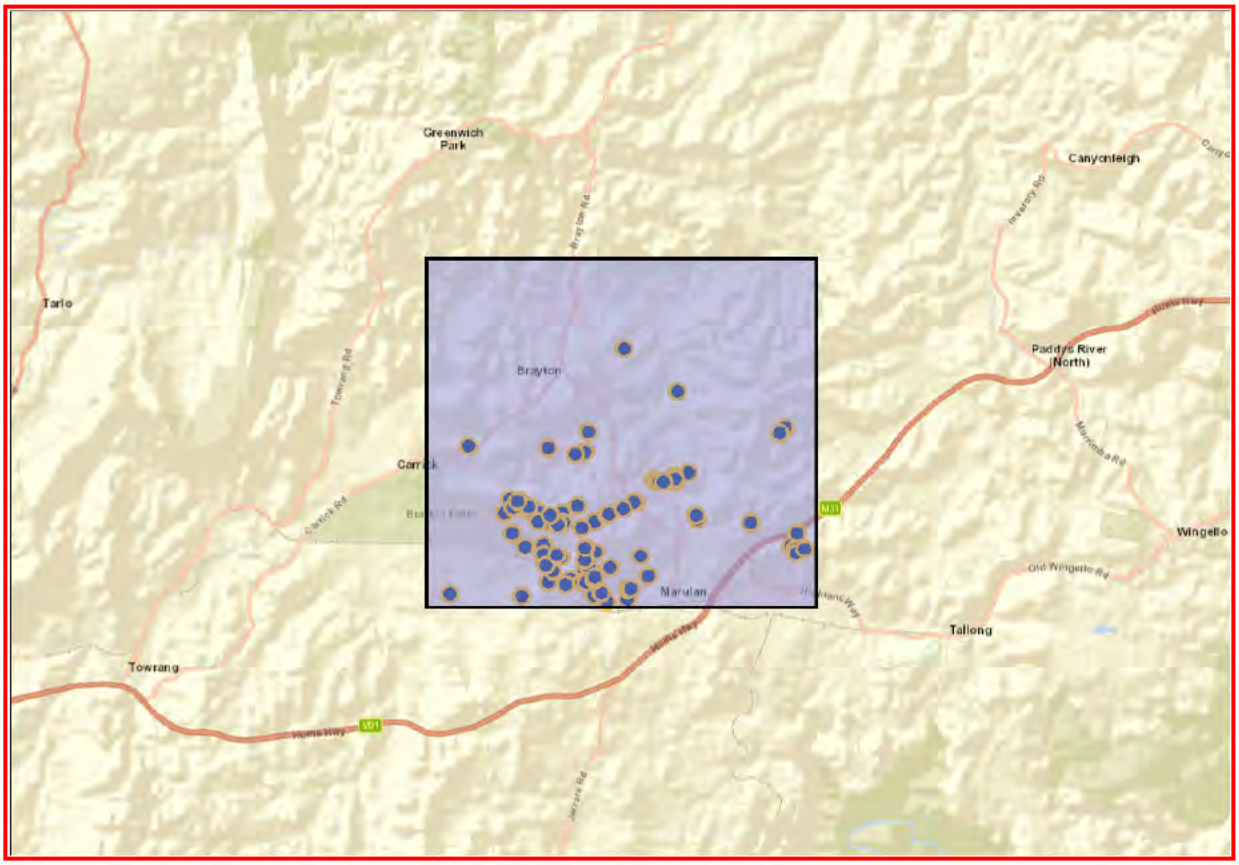
Email: alynch@emmconsulting.com.au

Date: 26 August 2025

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 56, Eastings : 218000.0 - 229000.0, Northings : 6155000.0 - 6165000.0 with a Buffer of 0 meters, conducted by Angus Lynch on 26 August 2025.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

94	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Level 6, 10 Valentine Ave, Parramatta 2150
Locked Bag 5020 Parramatta NSW 2124
Tel: (02) 9585 6345

ABN 34 945 244 274
Email: ahims@environment.nsw.gov.au
Web: www.heritage.nsw.gov.au

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : E230595.6

Client Service ID : 1037263

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
51-6-0068	G13 (Towrang)	AGD	55	768800	6159650	Open site	Valid	Artefact : -	Open Camp Site	3112,99404
	Contact	**Recorders**	Doctor.Susan (left ahms) Mcintyre-Tamwoy					**Permits**		
51-6-0634	MRN74	AGD	55	770981	6155531	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users					**Permits**		
51-6-0782	LA31 (East) incorporating PAD 1 East	GDA	55	770359	6158155	Open site	Destroyed	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users,Mr.Kirwan Williams,Mr.Kirwan V					**Permits**		
51-6-0891	BR-IF-02 (Brayton Road)	GDA	55	774208	6158668	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Kayandel Archaeological Services,Ms.Natalie Stiles					**Permits**		
51-6-0621	MRN60	AGD	55	772118	6156552	Open site	Valid	Artefact : 1		101034
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users					**Permits**		
51-6-0622	MRN61	AGD	55	772028	6155544	Open site	Valid	Artefact : -		101034
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users					**Permits**		
51-6-0778	LKAS4	GDA	55	770666	6157889	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users,Umwelt (Australia) Pty Limited -					**Permits**		
51-6-0268	MRN27	AGD	55	772232	6155840	Open site	Valid	Artefact : 153		100613,100615,100637,101183,101402
	Contact Searle	**Recorders**	Mr.Graham Houghton					**Permits**	2760,2761	
51-6-0290	MRN49	AGD	55	772377	6156399	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact Searle	**Recorders**	Mr.Graham Houghton					**Permits**		
51-6-0743	HSP25	GDA	55	773699	6158037	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd,Doctor.Rebecca Parkes					**Permits**		
51-6-0712	HSP 25	GDA	56	223947	6157955	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**		
51-6-0076	MAS 4	AGD	55	771400	6157280	Open site	Valid	Artefact : -	Open Camp Site	99404
	Contact	**Recorders**	Mr.David Johnston					**Permits**		
51-6-0629	MRN68	AGD	55	771098	6155887	Open site	Valid	Artefact : -		101034
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users					**Permits**		
51-6-0637	MRN77	AGD	55	770207	6155168	Open site	Valid	Artefact : -		101034
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users					**Permits**		

Report generated by AHIMS Web Service on 26/08/2025 for Angus Lynch for the following area at Datum :GDA, Zone : 56, Eastings : 218000.0 - 229000.0, Northings : 6155000.0 - 6165000.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 94

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
51-6-0647	MRN78	AGD	55	772650	6154940	Open site	Valid	Artefact : 7		100403,101645
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users					**Permits**	3116	
51-6-0890	BR-IF-01 (Brayton Road)	GDA	55	774320	6158642	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Kayandel Archaeological Services,Ms.Natalie Stiles					**Permits**		
51-6-0772	LKST1	GDA	55	769879	6157833	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Ms.Janice Wilson					**Permits**		
51-6-0267	MRN26	AGD	55	772059	6155842	Open site	Valid	Artefact : 1		100613,100615,100637,101183
	Contact Searle	**Recorders**	Mr.Graham Houghton					**Permits**	2760,2761	
51-6-0269	MRN28	AGD	55	772784	6155926	Open site	Valid	Artefact : 3		100613,100615,100637,101034,101183,101402
	Contact Searle	**Recorders**	Mr.Graham Houghton					**Permits**	2760,2761	
51-6-0273	MRN32	AGD	55	771622	6155602	Open site	Valid	Stone Arrangement : -		100613
	Contact Searle	**Recorders**	Mr.Graham Houghton					**Permits**		
51-6-0275	MRN34	AGD	55	772295	6155142	Open site	Valid	Artefact : 30		
	Contact Searle	**Recorders**	Mr.Graham Houghton					**Permits**		
51-6-0289	MRN48	AGD	55	772161	6155992	Open site	Valid	Artefact : 2		100613,100615,100637,101034,101183
	Contact Searle	**Recorders**	Mr.Graham Houghton					**Permits**	2760,2761	
52-4-0342	MC-IF-001	GDA	56	228508	6156820	Open site	Valid	Artefact : 1		103079
	Contact	**Recorders**	Kayandel Archaeological Services					**Permits**		
51-6-0742	HSP24	GDA	55	772476	6157513	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd,Doctor.Rebecca Parkes					**Permits**		
51-6-0744	HSP26	GDA	55	774854	6158581	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd,Doctor.Rebecca Parkes					**Permits**		
51-6-0074	MAS1	AGD	55	771450	6157600	Open site	Valid	Artefact : -	Open Camp Site	99404
	Contact	**Recorders**	Mr.David Johnston					**Permits**		
51-6-0077	MAS 5	AGD	55	771450	6157320	Open site	Valid	Artefact : -	Open Camp Site	99404
	Contact	**Recorders**	Mr.David Johnston					**Permits**		
51-6-0463	Marulan T1 S8	AGD	55	773240	6154960	Open site	Valid	Artefact : 3		100614

Report generated by AHIMS Web Service on 26/08/2025 for Angus Lynch for the following area at Datum :GDA, Zone : 56, Eastings : 218000.0 - 229000.0, Northings : 6155000.0 - 6165000.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 94

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : E230595.6

Client Service ID : 1037263

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact Searle	**Recorders**	Umwelt (Australia) Pty Limited - Individual users					**Permits**		
51-6-0624	MRN63	AGD	55	772044	6156170	Open site	Valid	Artefact : 1		101034
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users					**Permits**		
51-6-0648	MRN79	AGD	55	771360	6156291	Open site	Valid	Artefact : 22		101183,101645
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users					**Permits**	3116	
51-6-0749	GL3 - Gunlake Quarry 3	GDA	55	772393	6160148	Open site	Destroyed	Artefact : 3		100850,102040,104886
	Contact Ms.Delise Freeman	**Recorders**	Mr.David Johnston					**Permits**		
52-4-0382	GL4 - Gunlake Quarry 4	GDA	55	775442	6157488	Open site	Destroyed	Artefact : 1		100850,102040
	Contact Ms.Delise Freeman	**Recorders**	Mr.David Johnston					**Permits**		
52-4-0383	GL5 - Gunlake Quarry 5	GDA	55	776975	6157325	Open site	Destroyed	Artefact : 2		100850,102040
	Contact Ms.Delise Freeman	**Recorders**	Mr.David Johnston					**Permits**		
51-6-0783	LA31 West incorporating PAD 1 West	GDA	55	770293	6158151	Open site	Destroyed	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users,Mr.Kirwan Williams,Ms.Janice W					**Permits**		
51-6-0785	LKAS2	GDA	55	770765	6157842	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users,Mr.Kirwan Williams,Ms.Janice W					**Permits**		
51-6-0799	LKAS9	GDA	55	770580	6158004	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users,Mr.Kirwan Williams					**Permits**		
51-6-0800	LKAS8	GDA	55	770468	6156813	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users,Mr.Kirwan Williams					**Permits**		
52-4-0593	MC-IF-005	GDA	56	228687	6157185	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Kayandel Archaeological Services					**Permits**		
51-6-0709	HSP17(23-24)	GDA	55	772837	6157693	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**		
51-6-0771	LKIF3	GDA	55	771002	6156845	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users,Mr.Kirwan Williams,Ms.Janice W					**Permits**		
51-6-0773	LKST2	GDA	55	771190	6157525	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users,Ms.Janice Wilson,Ms.Janice Wilso					**Permits**		
51-6-0293	MRN52	AGD	55	772516	6155170	Open site	Valid	Artefact : 1		100613,100615,101034,101183
	Contact Searle	**Recorders**	Mr.Graham Houghton					**Permits**	2760,2761	
51-6-0737	HSP17	GDA	55	772905	6157718	Open site	Valid	Artefact : 1		

Report generated by AHIMS Web Service on 26/08/2025 for Angus Lynch for the following area at Datum :GDA, Zone : 56, Eastings : 218000.0 - 229000.0, Northings : 6155000.0 - 6165000.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 94

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : E230595.6

Client Service ID : 1037263

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd,Doctor.Rebecca Parkes					**Permits**		
51-6-1000	CB CMT1	GDA	55	773485	6162566	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	ERM- Sydney,Mr.Dean Wilson					**Permits**		
51-6-0627	MRN66	AGD	55	771136	6156243	Open site	Valid	Artefact : -		101034
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users					**Permits**		
47-6-0791	GL 15,	GDA	55	771209	6159716	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Ryan Desic,Doctor.Alan (emm consulting) Williams,Doctor.Alan (emm consultin					**Permits**		
51-6-0777	Lockyersleigh Pad 6	GDA	55	770999	6156317	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	WILCANNIA LALC					**Permits**		
51-6-0780	LKAS5	GDA	55	770086	6157218	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Ms.Janice Wilson					**Permits**		
51-6-0781	LKAS6	GDA	55	770067	6158242	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Ms.Janice Wilson					**Permits**		
52-4-0344	MC-IF-002	GDA	56	228637	6156728	Open site	Valid	Artefact : 1		103079
	Contact	**Recorders**	Kayandel Archaeological Services					**Permits**		
51-6-0741	HSP23	GDA	55	772119	6157322	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd,Doctor.Rebecca Parkes					**Permits**		
51-6-0080	MAS 2	AGD	55	771300	6157320	Open site	Valid	Artefact : -	Open Camp Site	99404
	Contact	**Recorders**	Mr.David Johnston					**Permits**		
51-6-0387	LA32	GDA	55	770149	6157993	Open site	Destroyed	Artefact : 1		99620
	Contact Searle	**Recorders**	Archaeological Heritage Surveys,Umwelt (Australia) Pty Limited - Individual users,					**Permits**		
51-6-0769	LKIF1	GDA	55	770979	6156573	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Ms.Janice Wilson					**Permits**		
51-6-0774	Lockyersleigh PAD2	GDA	55	770468	6156813	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users,Mr.Kirwan Williams,Ms.Janice W					**Permits**		
51-6-0779	LKAS3	GDA	55	771038	6156240	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users,Mr.Kirwan Williams,Ms.Janice W					**Permits**		
51-6-0270	MRN29	AGD	55	773675	6156234	Open site	Valid	Artefact : 30		
	Contact Searle	**Recorders**	Mr.Graham Houghton					**Permits**		

Report generated by AHIMS Web Service on 26/08/2025 for Angus Lynch for the following area at Datum :GDA, Zone : 56, Eastings : 218000.0 - 229000.0, Northings : 6155000.0 - 6165000.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 94

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : E230595.6

Client Service ID : 1037263

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
51-6-0272	MRN31	AGD	55	771622	6155609	Open site	Valid	Modified Tree (Carved or Scarred) : -		100613
	Contact Searle	**Recorders** Mr.Graham Houghton						**Permits**		
51-6-0288	MRN47	AGD	55	773860	6155644	Open site	Valid	Artefact : 11		
	Contact Searle	**Recorders** Mr.Graham Houghton						**Permits**		
52-4-0326	HSP14	GDA	56	225474	6158896	Open site	Valid	Artefact : 1		
	Contact	**Recorders** Navin Officer Heritage Consultants Pty Ltd,Doctor.Rebecca Parkes						**Permits**		
51-6-0114	Joarimin	AGD	55	774710	6158610	Open site	Valid	Artefact : -		99404
	Contact	**Recorders** Ms.Vanessa Edmonds						**Permits**		
51-6-0266	MRN25	GDA	55	771356	6156529	Open site	Destroyed	Artefact : 10		100613,100615,100637,101183,101402
	Contact Searle	**Recorders** Umwelt (Australia) Pty Limited - Individual users,Mr.Graham Houghton,Mr.Kirwan						**Permits**	2760,2761	
51-6-0711	HSP 26	GDA	56	225103	6158677	Open site	Valid	Artefact : 1		
	Contact	**Recorders** Navin Officer Heritage Consultants Pty Ltd						**Permits**		
52-4-0385	MC-SA-001	GDA	56	228671	6156610	Open site	Valid	Stone Arrangement : -		
	Contact	**Recorders** Kayandel Archaeological Services						**Permits**		
51-6-0942	Lockyersleigh Creek OS-1	GDA	55	768253	6155456	Open site	Partially Destroyed	Artefact : -		
	Contact	**Recorders** OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an						**Permits**		
51-6-0075	MIF 1	AGD	55	771900	6157800	Open site	Valid	Artefact : -	Isolated Find	99323,99404
	Contact	**Recorders** Mr.David Johnston						**Permits**		
51-6-0626	MRN65	AGD	55	771960	6155515	Open site	Valid	Artefact : -		101034
	Contact	**Recorders** Umwelt (Australia) Pty Limited - Individual users						**Permits**		
51-6-0649	MRN 77	AGD	55	770207	6155168	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		100779
	Contact	**Recorders** Umwelt (Australia) Pty Limited - Individual users						**Permits**		
51-6-0750	GL123 (Gunlake Quarry) relocated GL1, GL2 and GL3	AGD	55	772269	6159941	Open site	Valid	Artefact : 15		100850,102040,104886
	Contact Ms.Delise Freeman	**Recorders** Mr.Edward ONeil						**Permits**		
51-6-0784	LKAS1 incorporating PAD3	GDA	55	770862	6157841	Open site	Destroyed	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders** Umwelt (Australia) Pty Limited - Individual users,Mr.Kirwan Williams,Ms.Janice W						**Permits**		
51-6-0770	LKIF2	GDA	55	770593	6157907	Open site	Destroyed	Artefact : -		
	Contact	**Recorders** Umwelt (Australia) Pty Limited - Individual users,Mr.Kirwan Williams,Ms.Janice W						**Permits**		

Report generated by AHIMS Web Service on 26/08/2025 for Angus Lynch for the following area at Datum :GDA, Zone : 56, Eastings : 218000.0 - 229000.0, Northings : 6155000.0 - 6165000.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 94

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : E230595.6

Client Service ID : 1037263

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
51-6-0775	LKAS7/ formerly PAD4	GDA	55	770852	6157541	Open site	Destroyed	Potential Archaeological Deposit (PAD) : -, Artefact : -		
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users,Umwelt (Australia) Pty Limited -					**Permits**		
51-6-0776	Lockyersleigh PAD 5	GDA	55	770580	6158004	Open site	Destroyed	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users,Mr.Kirwan Williams,Ms.Janice W					**Permits**		
51-6-0271	MRN30	AGD	55	772067	6155501	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Mr.Graham Houghton					**Permits**		
51-6-0277	MRN36	AGD	55	773255	6155299	Open site	Valid	Artefact : 3		100613,100615,100637,101034
	Contact Searle	**Recorders**	Mr.Graham Houghton					**Permits**	2760,2761	
51-6-0278	MRN37	AGD	55	773251	6155251	Open site	Valid	Artefact : 1		100613,100615,100637,101034,101183
	Contact Searle	**Recorders**	Mr.Graham Houghton					**Permits**	2760,2761	
51-6-0291	MRN50	AGD	55	772321	6155564	Open site	Valid	Artefact : 6		
	Contact Searle	**Recorders**	Mr.Graham Houghton					**Permits**		
51-6-0292	MRN51	AGD	55	772334	6155662	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact Searle	**Recorders**	Mr.Graham Houghton					**Permits**		
52-4-0341	MC-IF-003	GDA	56	228903	6156732	Open site	Valid	Artefact : 1		103079
	Contact	**Recorders**	Kayandel Archaeological Services					**Permits**		
51-6-0746	HSP28	GDA	55	773309	6157867	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd,Doctor.Rebecca Parkes					**Permits**		
51-6-0079	MAS 3	AGD	55	771300	6157250	Open site	Valid	Artefact : -	Open Camp Site	99404
	Contact	**Recorders**	Mr.David Johnston					**Permits**		
52-4-0384	GL45 (Gunlake Quarry) relocation of GL4 and GL5	AGD	55	775299	6157408	Open site	Valid	Artefact : 3		100850,102040
	Contact Ms.Delise Freeman	**Recorders**	Mr.Edward ONeil					**Permits**		
51-6-0748	GL2 - Gunlake Quarry 2	GDA	55	772251	6159535	Open site	Destroyed	Artefact : 6		100850,102040,104886
	Contact	**Recorders**	Mr.David Johnston,AASC and CHMA					**Permits**		
47-6-0941	BR-AS-01	GDA	55	774392	6158622	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Kayandel Archaeological Services,Kayandel Archaeological Services,Ms.Natalie Stil					**Permits**		
47-6-0942	BR-AS-02	GDA	55	774507	6158610	Open site	Valid	Artefact : -		

Report generated by AHIMS Web Service on 26/08/2025 for Angus Lynch for the following area at Datum :GDA, Zone : 56, Eastings : 218000.0 - 229000.0, Northings : 6155000.0 - 6165000.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 94

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : E230595.6

Client Service ID : 1037263

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Kayandel Archaeological Services,Kayandel Archaeological Services,Ms.Natalie Stil					**Permits**		
51-6-0386	LA 31	AGD	55	770149	6157993	Open site	Valid	Artefact : 6		99620
	Contact Searle	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0388	LA 33	AGD	55	771087	6157544	Open site	Valid	Artefact : 1		99620
	Contact Searle	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0623	MRN62	AGD	55	772072	6156534	Open site	Valid	Artefact : -		101034
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users					**Permits**		
51-6-0747	GL1 - Gunlake Quarry 1	GDA	55	771978	6159494	Open site	Destroyed	Artefact : 6		100850,102040,104886
	Contact	**Recorders**	Mr.David Johnston					**Permits**		
57-3-0234	Millendale Creek;	AGD	55	774880	6161071	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	P Spears,Doctor.Sue Feary,Mr.Douglas Williams					**Permits**	87	
51-6-0274	MRN33	AGD	55	771484	6155470	Open site	Valid	Artefact : 1		100613,100615,100637,101034,101183
	Contact Searle	**Recorders**	Mr.Graham Houghton					**Permits**	2760,2761	
51-6-0276	MRN35	AGD	55	773340	6155286	Open site	Valid	Artefact : 1		100613,100615,100637,101034,101183
	Contact Searle	**Recorders**	Mr.Graham Houghton					**Permits**	2760,2761	
52-4-0330	HSP30	GDA	56	228237	6160275	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd,Doctor.Rebecca Parkes					**Permits**		
52-4-0315	HSP 29 (+30)	GDA	56	228097	6160132	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**		

**** Site Status**

Valid - The site has been recorded and accepted onto the system as valid

Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.

Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 26/08/2025 for Angus Lynch for the following area at Datum :GDA, Zone : 56, Eastings : 218000.0 - 229000.0, Northings : 6155000.0 - 6165000.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 94

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C.3 Site card for GL-AT1 (#51-6-1011)

Aboriginal Site Recording Form

Manager, Information Systems
Locked Bag 5020, Parramatta 2124 NSW

AHIMS site ID: 51-6-1011 **Date recorded:** 20-11-2025

Site Location Information

Site name: GL-AT1

Easting: 771313 **Northing:** 6159561 **Coordinates must be in GDA94 (MGA)**

Horizontal Accuracy (m): 10

Zone: 55 Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Ms.	Burnett	Georgia

Organisation:

Address: Ground floor, 20 Chandos Street, St Leonards NSW 2065

Phone: 0295554000 **E-mail:** gburnett@emmconsulting.com.au

Site Context Information

Land Form Pattern: Rolling Hills **Land Use:** Mining

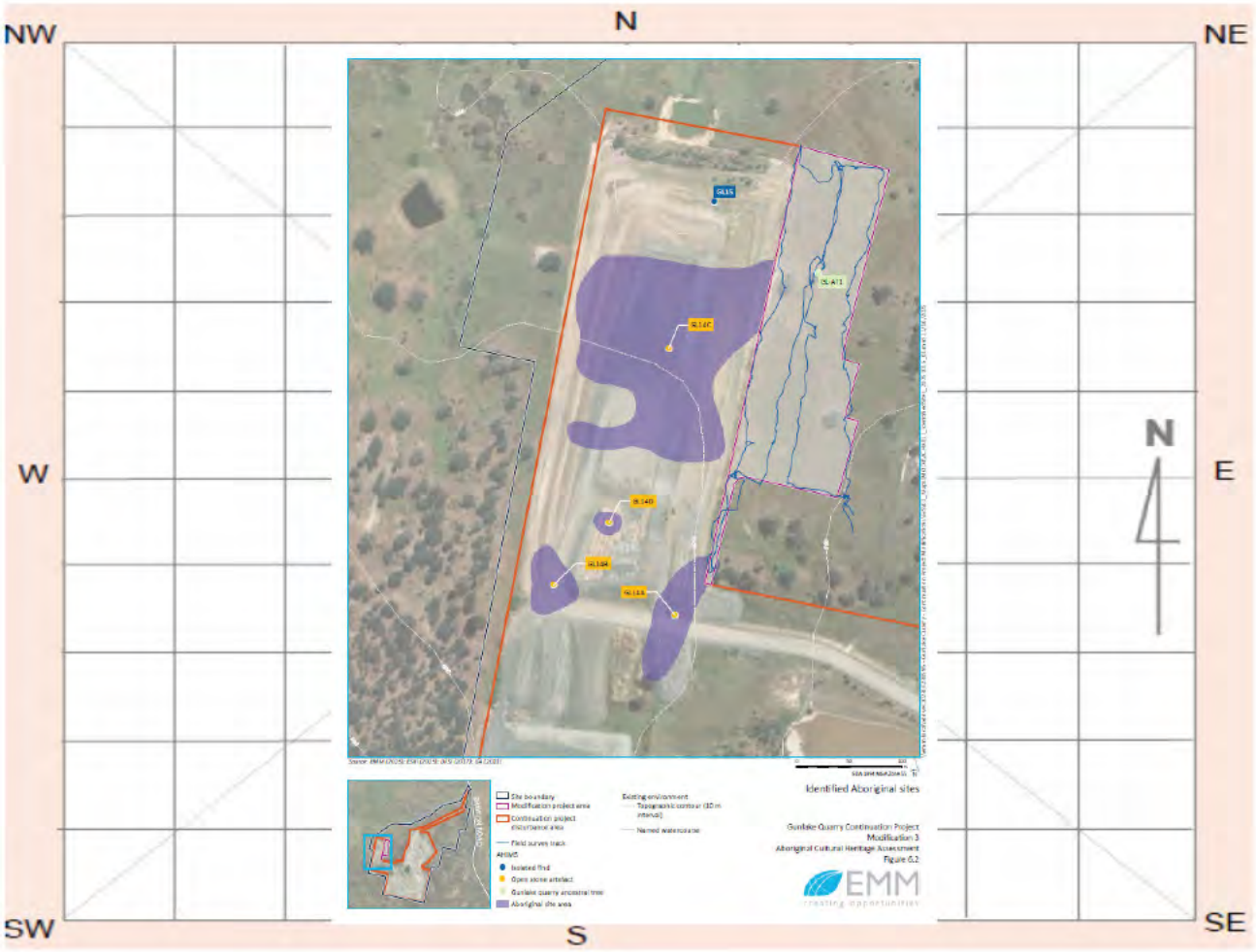
Land Form Unit: Plain **Vegetation:** Isolated clumps of trees

Distance to Water (m): 200 **Primary Report:** EMM 2025 Gunlake Quarry ACHA

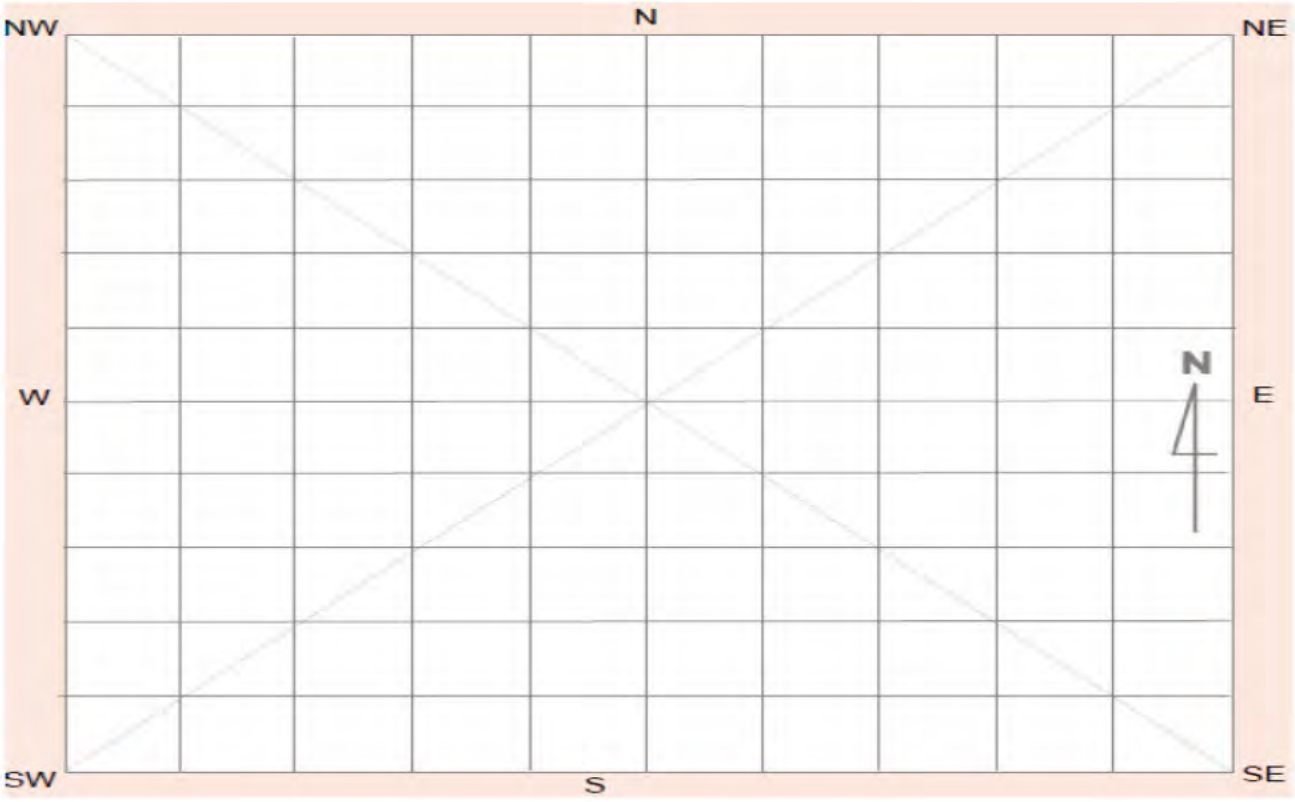
How to get to the site: Access must be coordinated through Gunlake Quarry, and an escort must be present at all times.

Other site information: -

Site location map



Site plan



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. Modified Tree	0	0	0	0	0	Other	

Feature condition: Good

Description:

Unmodified stringy bark identified as a culturally significant ancestral tree by an Aboriginal stakeholder.

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.							

Feature condition:

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.							

Feature condition:

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.							Stringy Bark

Feature condition:

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.							

Feature condition:

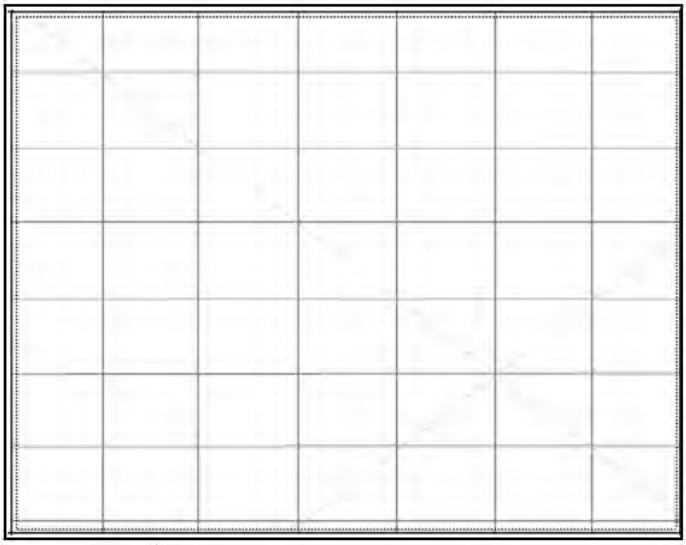
Description:

Site photographs

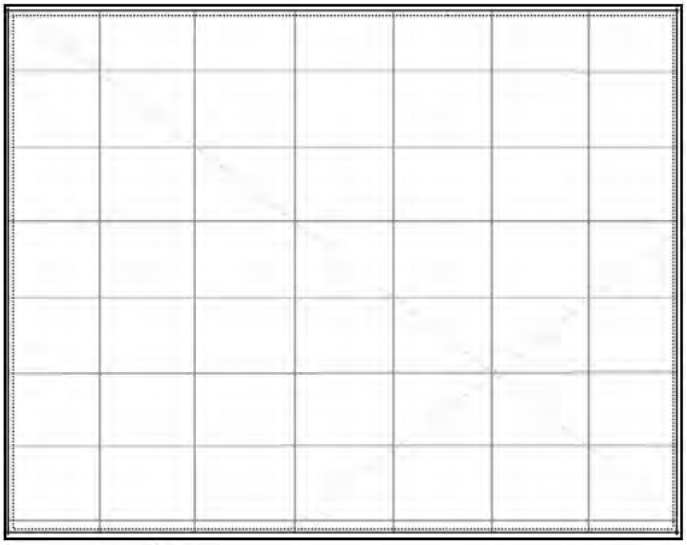


Description: Potential ancestral tree (GL-AT1) identified by an Aboriginal participant. View south-west.

Description:



Description:



Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender: N/A | General: | Location:

Why is this site restricted?:

Further information contact

Title	Surname	First name
Mr.	Delponte	Dean

Organisation: Ngunawal Heritage Aboriginal Corporation

Address: 245 Ash Road, Prestons NSW 2170

Phone: 0413186133 **E-mail:** ngunawalhac@gmail.com

Site interpretation and community statement

Scientifically, this site has no values, being an unmodified tree with no evidence of modification or past use. Indeed, while natural growth phenomena such as signal and ring trees are increasingly presented as reflecting past activity, there is no anthropological or historical evidence of such features; and they reflect a contemporary perception of the cultural landscape by Aboriginal people. As such, the values of this site are entirely based on the views and perspectives of the Aboriginal participants.

Appendix D
Field investigation

EMM
creating opportunities

D.1 Photographic catalogue (field survey)

Photo Point ID: 8783 - E230595

Photo 1: N	Photo 2: E	Photo 3: S
		
Photo 4: W	**Photo 5:**	**Location:**
		

Photo Point ID: 8784 - E230595

Photo 1: N	Photo 2: E	Photo 3: S
		
Photo 4: W	**Photo 5:**	**Location:**
		

Photo Point ID: 8785 - E230595

Photo 1: N	Photo 2: E	Photo 3: S
		
Photo 4: W	**Photo 5:**	**Location:**
		

Photo Point ID: 8786 - E230595

Photo 1: N	Photo 2: S	Photo 3: W
		
Photo 4: E	**Photo 5:**	**Location:**
		

Photo Point ID: 8787 - E230595

Photo 1: N	Photo 2: E	Photo 3: S
		
Photo 4: W	**Photo 5:**	**Location:**
		

Photo Point ID: 8788 - E230595

Photo 1: View of tree facing west	Photo 2:	Photo 3:
		
Photo 4:	**Photo 5:**	**Location:**
		

Photo Point ID: 8789 - E230595

Photo 1: N	Photo 2: E	Photo 3: S
		
Photo 4: W	**Photo 5:**	**Location:**
		

Photo Point ID: 8790 - E230595

Photo 1: N	Photo 2: S	Photo 3: W
		
Photo 4: E	**Photo 5:**	**Location:**
		

Photo Point ID: 8791 - E230595

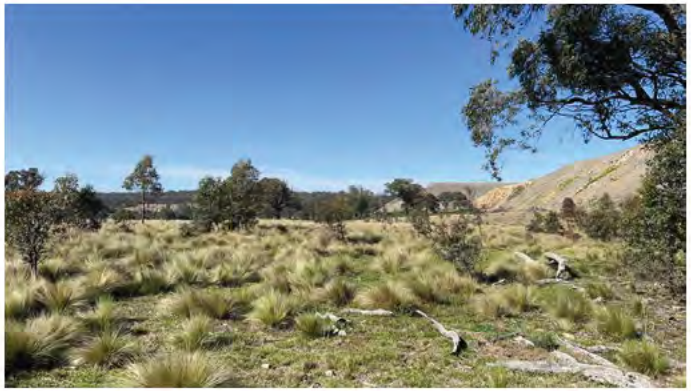
Photo 1: SW	Photo 2: W	Photo 3: S
		
Photo 4: E	**Photo 5: N**	**Location:**
		

Photo Point ID: 8792 - E230595

Photo 1: N	Photo 2: S	Photo 3: E
		
Photo 4: W	**Photo 5:**	**Location:**
		

Photo Point ID: 8793 - E230595

Photo 1: N	Photo 2: E	Photo 3: S
		
Photo 4: W	**Photo 5:**	**Location:**
		

Photo Point ID: 8794 - E230595

Photo 1: NW	Photo 2: N	Photo 3:
		
Photo 4:	**Photo 5:**	**Location:**
		

Photo Point ID: 8795 - E230595

Photo 1: S	Photo 2: W	Photo 3: N
		
Photo 4: E	**Photo 5:**	**Location:**
		

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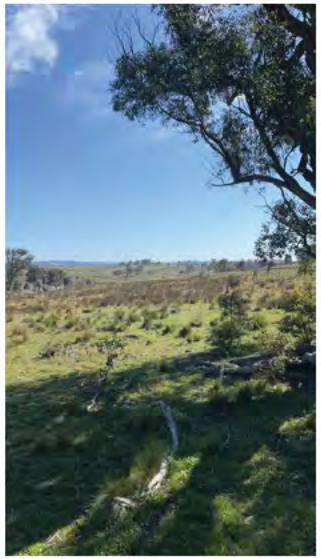
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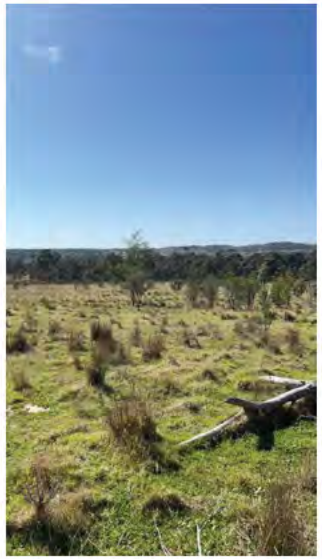
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Photo Point ID: 8805 - E230595

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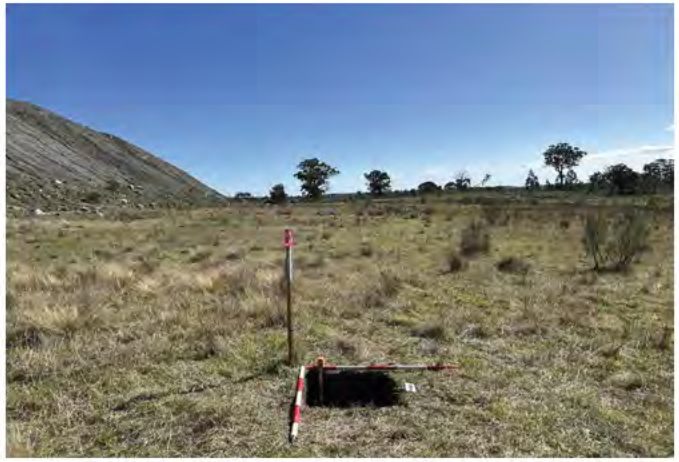
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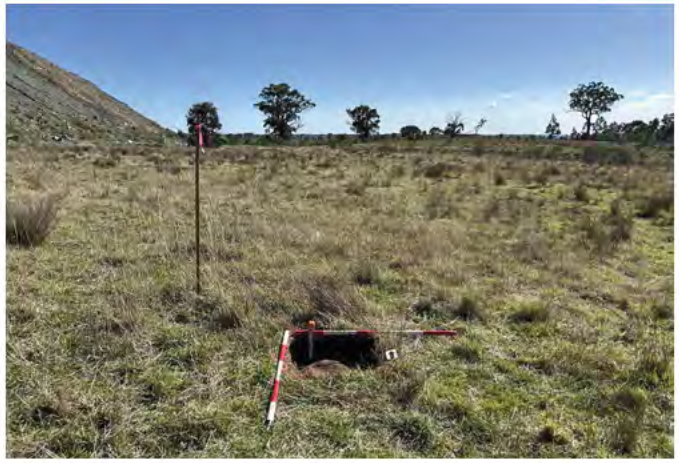
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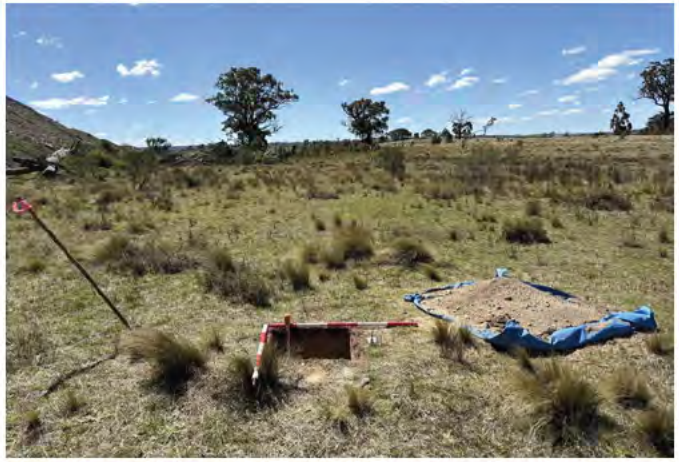
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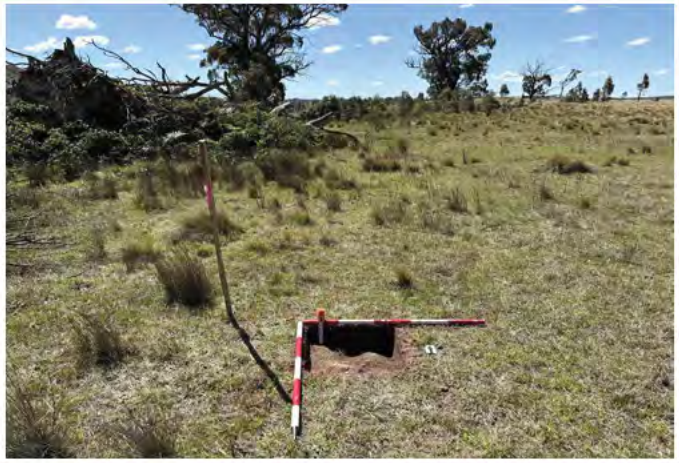
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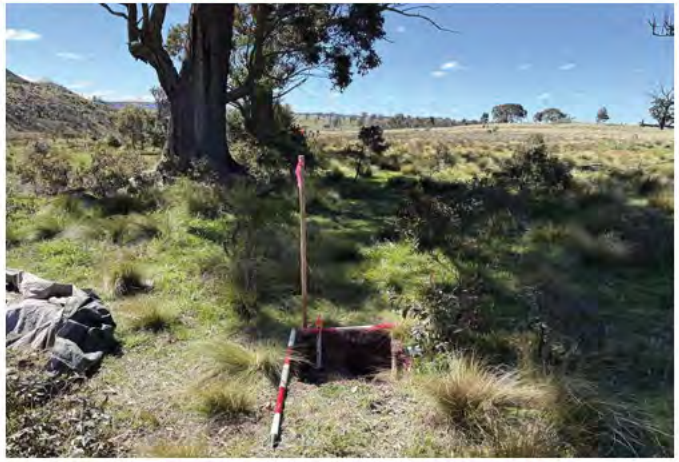
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Test pit ID: 4

Context North	Base of pit - north	North section
		

Test pit ID: 5

Context North	Base of pit - north	North section
		

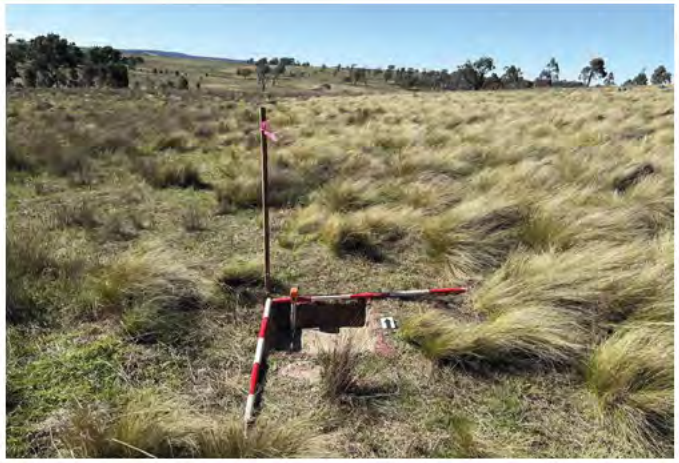
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Context North	Base of pit - north	North section
		

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Context North	Base of pit - north	North section
		

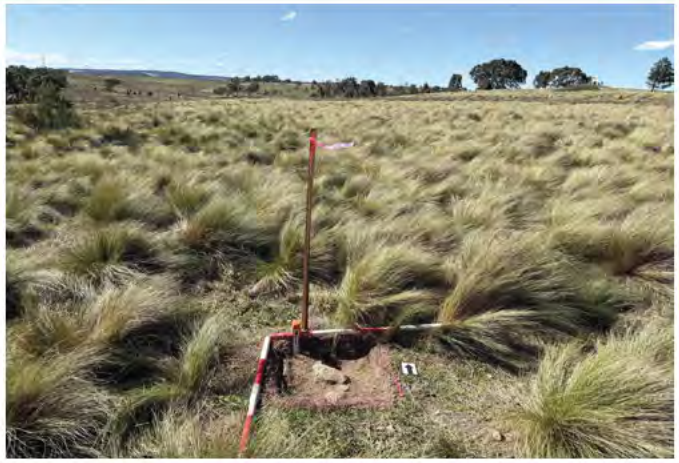
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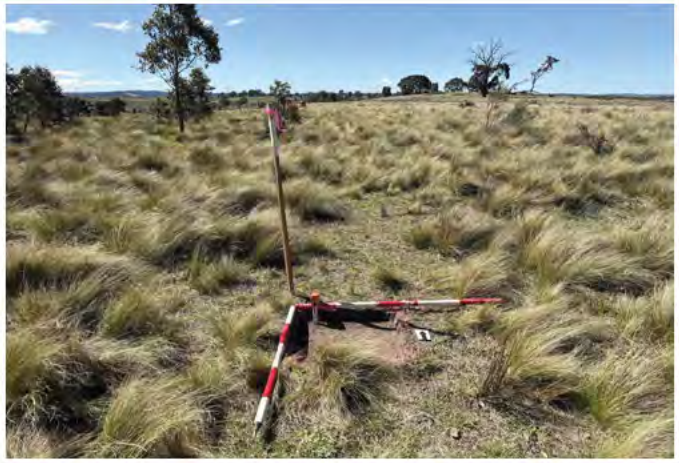
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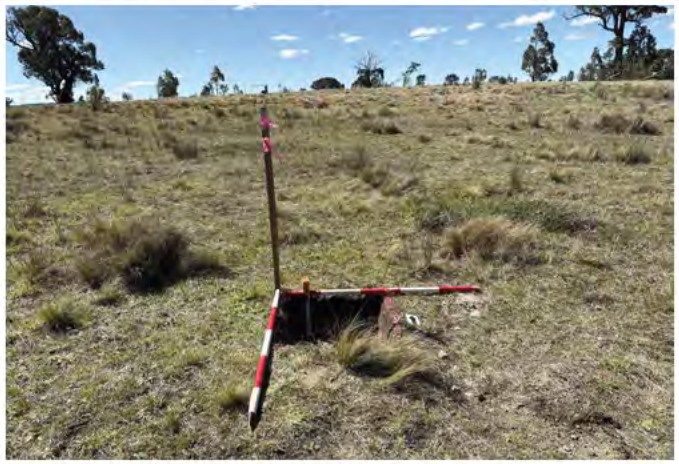
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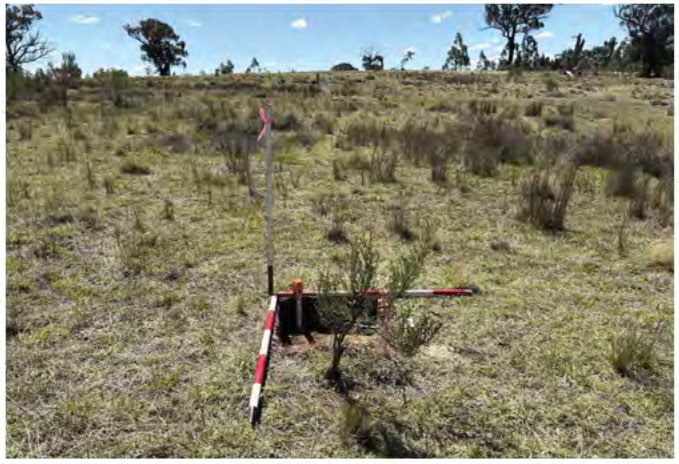
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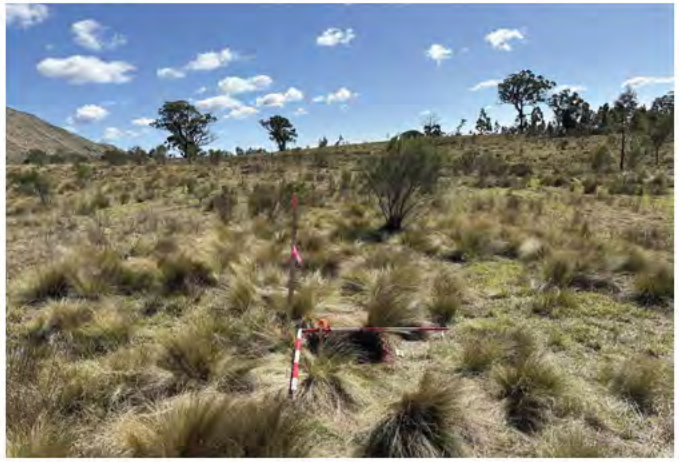
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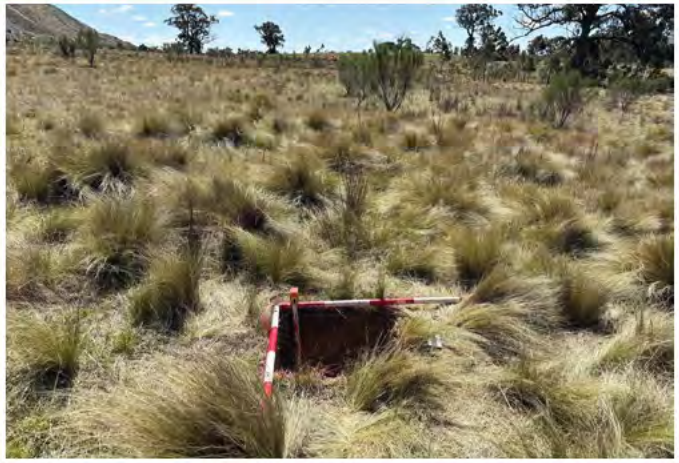
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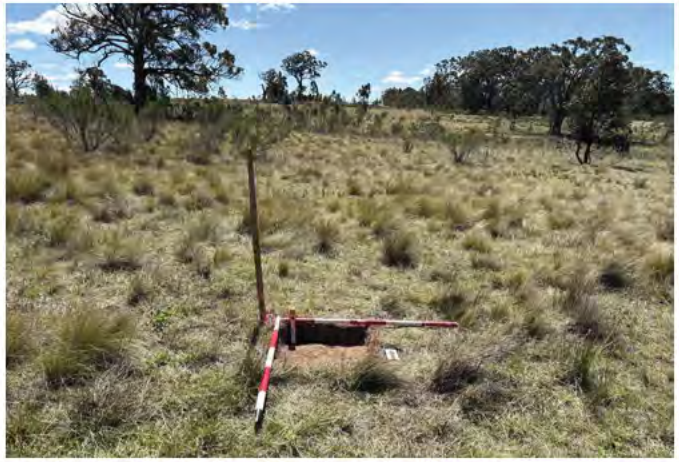
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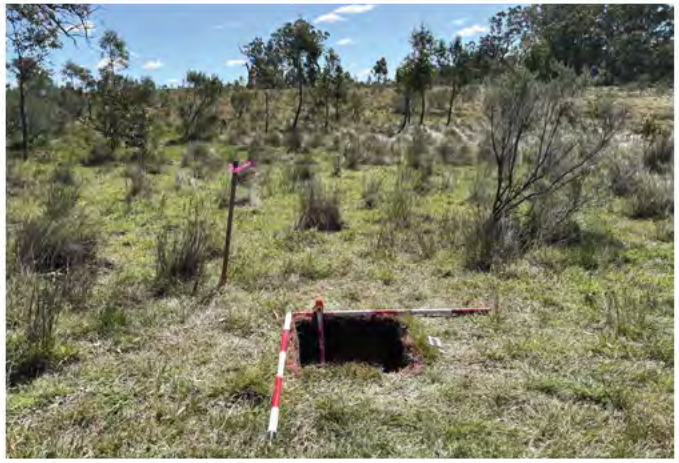
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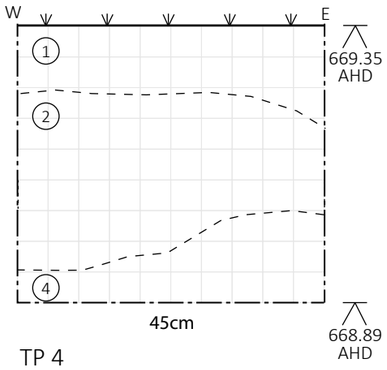
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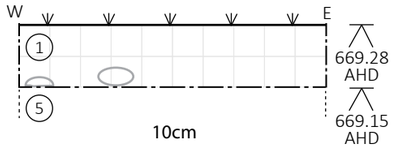
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Gunlake Quarry Test Pit Illustrations

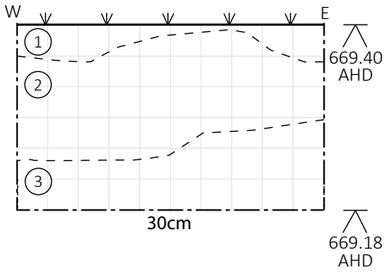
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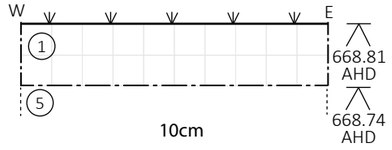
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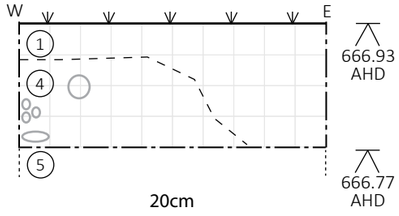
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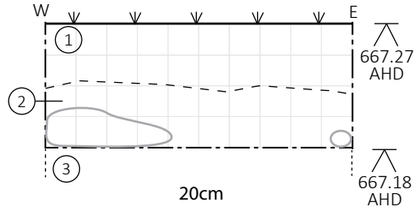
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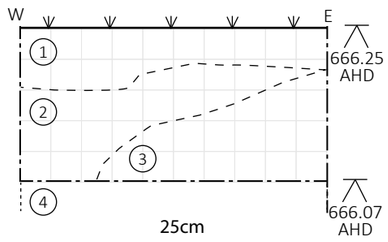
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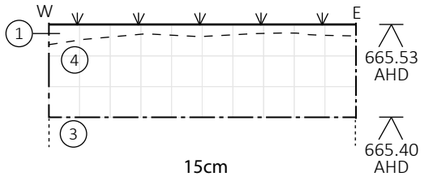
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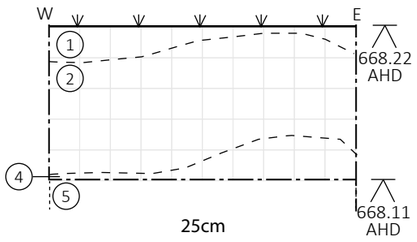
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TP 9
NORTH SECTION



1 BROWN SILTY CLAY LOAM

2 PALE SANDY CLAY LOAM

3 GREY LIGHT SANDY CLAY

4 LIGHT CLAY WITH SANDSTONE INCLUSIONS

5 SANDSTONE BOULDERS

EMM CONSULTANTS PTY LTD
Level 10, 201 Pacifc Highway
St Leonards NSW 2065
T 02 9493 9500
E info@emmconsulting.com.au
www.emmconsulting.com.au

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LEGEND

- PIT BOUNDARY
- SOIL PROFILE BOUNDARY
- DIFFUSE SOIL PROFILE BOUNDARY
- ROOTS
- STONES

CLIENT
GUNLAKE GROUP

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GUNLAKE QUARRY MODIFICATION 3

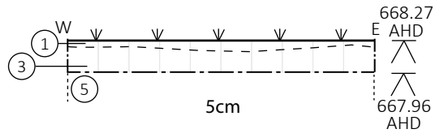
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TP SECTION DRAWINGS

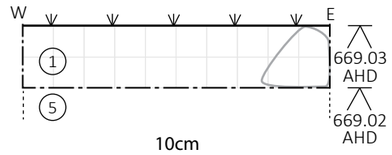
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PROJECT NO.	**VERSION**	
E230595	0.1	

Gunlake Quarry Test Pit Illustrations

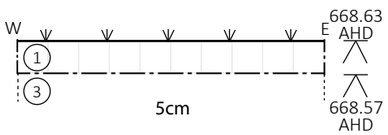
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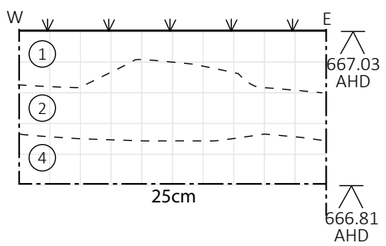
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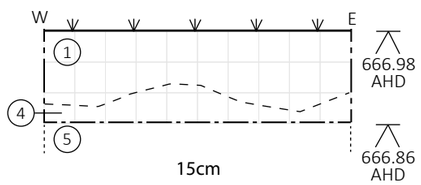
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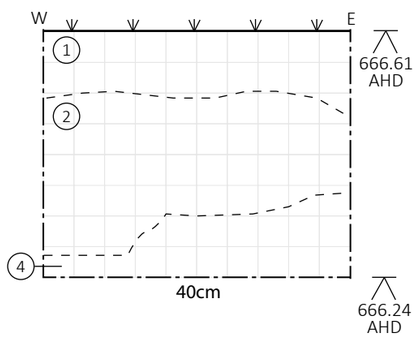
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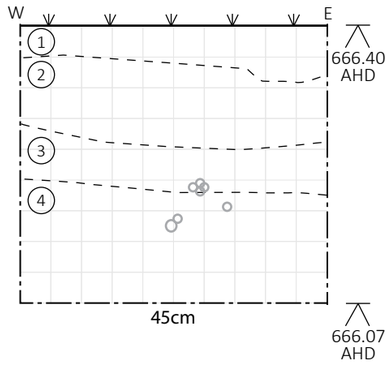
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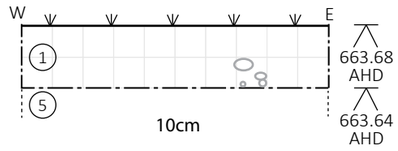
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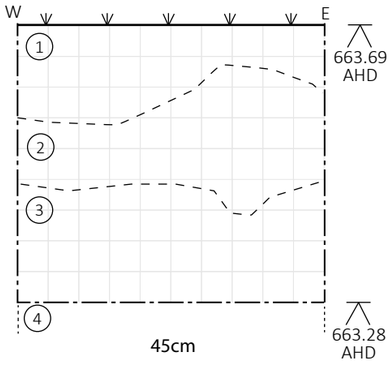
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TP 18
NORTH SECTION



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TITLE
TEST PIT SECTION DRAWINGS

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Australia

SYDNEY
Level 10 201 Pacific Highway
St Leonards NSW 2065
T 02 9493 9500

NEWCASTLE
Level 3 175 Scott Street
Newcastle NSW 2300
T 02 4907 4800

BRISBANE
Level 1 87 Wickham Terrace
Spring Hill QLD 4000
T 07 3648 1200

CANBERRA
Suite 2.04 Level 2
15 London Circuit
Canberra City ACT 2601

ADELAIDE
Level 4 74 Pirie Street
Adelaide SA 5000
T 08 8232 2253

MELBOURNE
Suite 9.01 Level 9
454 Collins Street
Melbourne VIC 3000
T 03 9993 1900

PERTH
Suite 3.03
111 St Georges Terrace
Perth WA 6000
T 08 6430 4800

Canada

TORONTO
2345 Yonge Street Suite 300
Toronto ON M4P 2E5
T 647 467 1605

VANCOUVER
2015 Main Street
Vancouver BC V5T 3C2
T 604 999 8297

CALGARY
700 2nd Street SW Floor 19
Calgary AB T2P 2W2

linkedin.com/company/emm-consulting-pty-limited

emmconsulting.com.au

Appendix B

Biodiversity Development Assessment Report

EMM
creating opportunities



NaturePositive Advisory

Gunlake Quarry MOD 3

Biodiversity Development Assessment Report - Small area assessment

Prepared for Gunlake Quarries Pty Ltd

25 November 2025

Document overview

Gunlake Quarries Pty Ltd

N250029 | RP1

25 November 2025

Version	Date	Prepared by	Reviewed by	Comments
1	20/10/2025	Cecilia Phu	Nathan Garvey	Draft issued for Client review
2	03/11/2025	Cecilia Phu	-	Final Draft
3	21/11/2025	Cecilia Phu	Nathan Garvey	Final Report
4	25/11/2025	Cecilia Phu	-	Minor updates to area calculations

Approved by



Nathan Garvey
Director | Principal Advisor
25 November 2025

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Shortened forms

AOBV	areas of outstanding biodiversity value
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
BDAR	Biodiversity Development Assessment Report
BioNet Atlas	BioNet Atlas of NSW Wildlife
BOS	NSW Biodiversity Offsets Scheme
CEEC	critically endangered ecological community
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth)
DFSI	Department of Finance, Services and Innovation (NSW)
DIWA	Directory of Important Wetlands
DPHI	Department of Planning, Housing and Infrastructure (NSW)
DPI	Department of Primary Industries (NSW)
DNG	derived native grassland
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPI	Environmental Planning Instrument
FM Act	*Fisheries Management Act 1994* (NSW)
GIS	Geographic Information System
GPS	Global Positioning System
IBRA	Interim Biogeographic Regionalisation for Australia
KFH	key fish habitat
KTP	key threatening process
LEC	Land and Environment Court (NSW)
LGA	local government area
MNES	matters of national environmental significance
Mtpa	million tonnes per annum
NSW	New South Wales
PCT	plant community type
PMST	protected matters search tool

Quarry	Gunlake Quarry
SAII	serious and irreversible impact
SEPP	State Environmental Planning Policy
SSD	State Significant Development
SVTM	State Vegetation Type Map
TBDC	Threatened Biodiversity Data Collection
TEC	threatened ecological community
VI	vegetation integrity
WM Act	*Water Management Act 2000* (NSW)

Declarations

i. Certification under clause 6.15 *Biodiversity Conservation Act 2016*

I certify that this report has been prepared based on the requirements of, and information provided under, the Biodiversity Assessment Method and clause 6.15 of the *Biodiversity Conservation Act 2016* (BC Act)	
Name:	Cecilia Phu
Signature:	
Date:	25/11/2025
BAM Assessor Accreditation No:	BAAS17058

This BDAR has been prepared to meet the requirements of the Biodiversity Assessment Method (BAM) (DPIE, 2020). Appendix A provides an assessment of compliance with the minimum information requirements outlined in Appendix K of the BAM.

ii. Details and experience of author/s and contributors

Name	BAM Assessor Accreditation No.	Position / Role	Tasks performed	Relevant qualifications
Cecilia Phu (Nature Positive Advisory Pty Ltd)	BAAS17058	Principal Botanist / Lead BDAR author	Report preparation; BAM-C data entry and analysis	B. Sci. (Honours) (Biological Sciences)
Nathan Garvey (Nature Positive Advisory Pty Ltd)	BAAS17037	Principal Advisor and Director / Technical reviewer and Quality Assurance	Document review; BAM plot survey (2024)	B. Sci., Grad. Dip. (Biological Science)
Isaac Mammott (Sclerophyll Flora Surveys and Research Pty Ltd)	BAAS18008	Director and Principal Botanist / Field botanist	BAM plot survey (2024)	B. Sci. (Botany/Plant Biology/Zoology), B. Arts (Economics)
Maya Potapowicz (EMM Consulting Pty Ltd)	BAAS 18157	Associate Ecologist / Field botanist	BAM plot survey (2023)	B. Env. Sci. (Environmental Management)
Madeleine Hunt (EMM Consulting Pty Ltd)	n/a	Graduate Ecologist / Field assistant	BAM plot survey (2023)	B. Env. Sci. & Mgmt (Marine Science)
Peter Tolley (Waratah Bushfire Planning)	n/a	Principal GIS Analyst / Spatial analyst	Spatial analysis; report figure preparation	B. Biotech., M. SciTech (Env. Sci), Grad. Dip. (Spatial Information)

iii. Conflict of interest

I declare that I have considered the circumstances and there is no actual, perceived or potential conflict of interest. This declaration has been made in the interests of full disclosure to the decision-maker. Full discloser has also been provided to the client.	
Name:	Cecilia Phu
Signature:	
Date:	25/11/2025
BAM Assessor Accreditation No:	BAAS17058

Stage 1: Biodiversity assessment

1 Introduction

1.1 Proposed development

1.1.1 Development overview

Gunlake Quarries Pty Ltd (Gunlake) operates a hard rock quarry (Quarry) located at 715 Brayton Road, Marulan, NSW. The Quarry is approximately 7 kilometres (km) north-west of Marulan in the Goulburn Mulwaree local government area (LGA). The land surrounding the Quarry is rural land with low population density.

The Quarry was originally approved in 2008 under Part 3A of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). This approval (PA07-0074) was surrendered in 2018 after a State Significant Development (SSD) approval was granted for the Gunlake Extension Project (the Extension Project). The Extension Project (SSD 7090) was approved in 2017 by the NSW Land and Environment Court (LEC) Approval 2017/108663.

On 2 March 2023, consent was granted for the Gunlake Quarry Continuation Project (SSD 12469087). The consent allows up to 4.2 million tonnes per annum (Mtpa) of product to be extracted and transported to market by road over a 30-year period.

On 22 January 2024, Gunlake applied to modify the Continuation Project consent (MOD 1) to seek approval to revise the extent and location of the approved biodiversity offset areas. This application (SSD-12469087-MOD 1) was approved on 10 July 2025.

On 6 March 2025, Gunlake submitted a second application to modify the Continuation Project consent (MOD 2) to seek approval to increase the approved heavy vehicle movements and to remove the limit for daily average heavy vehicle movements on the Secondary Transport Route. This application (SSD-12469087-MOD 2) was approved on 1 August 2025.

Gunlake is proposing an expansion of an existing emplacement area to support quarrying operations (the proposed development) and will submit a third application to modify the consent for SSD 12469087 (MOD 3). The proposed development will increase the existing Western Emplacement by approximately 29,971.85 m2 (3.00 ha) from its eastern boundary. This expansion area is the subject of this Biodiversity Development Assessment Report (BDAR) and is hereafter referred to as the subject land.

1.1.2 Location

The Quarry is approximately 7 km north-west of Marulan in the Goulburn Mulwaree LGA (Figure 1-1). The Quarry is located at 715 Brayton Road, Marulan, NSW on Lot 13 DP 1123374 and is accessed via a private entry road off Brayton Road.

The Quarry includes the extraction (i.e. pit) area, the Western Emplacement and the Eastern Emplacement. The subject land is located along the eastern boundary of the Western Emplacement (Figure 1-2).

Figure 1.1 | Regional context



Data source: WBP (2025); Nature Positive Advisory (2025); ABS (2021); DCSSS (2025); ESRI (2025); GA (2009; 2011)

LEGEND

- Gunlake Quarry
- Subject land (3.00 ha)

Existing environment

- Railway station
- Electricity transmission line
- Rail
- Major road
- Minor road
- Local road
- Vehicular track
- Named watercourse
- Waterbody
- Lot boundary
- Local government area
- Built up area

INSET

- Major road
- Minor road
- National park/reserve
- State forest



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N 0 0.5 1 km

Disclaimer: mapping is indicative only & data shown has an inherent level of inaccuracy (dependent on the data source). Location of mapped features & boundaries should be confirmed by a registered surveyor.

Figure prepared by: WARATAH BUSHFIRE PLANNING | GIS | ASSESSMENT

Path: D:_GIS_Working\NPA\N25006_Gunlake_BDAR\B_Maps\BDAR001_RegionalContext_20251121_02\BDAR001_RegionalContext_20251121_02.aprx

Figure 1.2 | The subject land



Data source: WBP (2025); Nature Positive Advisory (2025); DCSSS (2025); ESRI (2025); GA (2011)

LEGEND

- Gunlake Quarry
- Subject land (3.00 ha)

Existing environment

- Electricity transmission line
- Minor road
- Local road
- Vehicular track
- Watercourse/drainage line
- Waterbody
- Lot boundary

NaturePositive Advisory

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N 0 150 300 m

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Figure prepared by: WARATAH BUSHFIRE PLANNING | GIS | ASSESSMENT

Path: D:_GIS_Working\NPA\N25006_Gunlake_BDAR\B_Maps\BDAR002_SubjectLand_20251121_02\BDAR002_SubjectLand_20251121_02.aprx

1.1.3 Proposed development and the subject land

The proposed development will require the clearing of approximately 3.00 ha of derived native grassland (DNG) vegetation to establish the expanded Western Emplacement. The subject land will be accessed via the existing haul road connecting the current Western Emplacement with the extraction area. No additional infrastructure is required.

Revegetation of the emplacement areas is undertaken progressively to stabilise the landform and, as such, the subject land will be progressively revegetated as part of the broader rehabilitation plan for the Quarry.

1.2 Biodiversity Offsets Scheme entry

The Gunlake Quarry Continuation Project (SSD 12469087) was declared as a SSD Project under Part 4 Division 4.7 of the EP&A Act. Assessment in accordance with the Biodiversity Offset Scheme (BOS) and Biodiversity Assessment Method (BAM) (DPIE, 2020) is mandatory for SSD projects. Accordingly, this BDAR has been prepared.

1.3 Streamlined assessment

The BAM contains streamlined assessment modules that may be used in specific circumstances. The streamlined assessment module relevant to the proposed development is the streamlined assessment module - small area, which is set out in Appendix C of the BAM. According to the area clearing thresholds set out in Table 12 of Appendix C of the BAM, a development on land with a minimum lot size of 100 ha is eligible to be assessed using the small area streamlined assessment module if the area of clearing does not exceed 3.00 ha.

The minimum lot size associated with Lot 13 DP1123374 is 100 ha. The streamlined assessment module for assessment of small areas can be applied to the proposed development as the area of clearing proposed is below the maximum clearing limit of 3.00 ha.

The proposed development is therefore assessed using the streamlined assessment module - small area in accordance with the requirements set out in Appendix C of the BAM (refer to compliance table in Appendix A of this report).

1.4 Information sources

1.4.1 Publications and databases

In order to provide context for the proposed development, information about flora and fauna species, populations, communities and habitats from the locality (generally within 10 km) was obtained from the following databases:

- BioNet Atlas of NSW Wildlife (BioNet Atlas), for threatened species records
- BioNet Threatened Biodiversity Data Collection (TBDC), for threatened species profiles
- BioNet Vegetation Classification database, for data on NSW plant community types (PCTs) profiles
- Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Search Tool (PMST) for a report on the Matters of National Environmental Significance (MNES) predicted to occur within the subject land.

1.4.2 Spatial data

Spatial data relating to the proposed development was provided by Gunlake.

Base map data was obtained from Department of Finance, Services and Innovation (DFSI) NSW databases, with cadastral data obtained from DFSI digital cadastral database. Mapping for stream orders was obtained from the Department of Primary Industries (DPI).

Other relevant spatial datasets considered and/or referenced in the preparation of this BDAR include:

- State Vegetation Type Mapping (SVTM) Release C2.0.M2.1
- Interim Biogeographic Regionalisation of Australia (IBRA) Version 7
- Strahler Stream Order
- Directory of Important Wetlands (DIWA)
- Mitchell Landscapes Version 3.1

Mapping undertaken during field assessment was conducted using mobile devices running ArcGIS Field Maps™ and ArcGIS Survey123™, and aerial photo interpretation. Accuracy is subject to accuracy of Global Positioning System (GPS) devices, generally ± 5 m. Mapping has been produced using a Geographic Information System (GIS; ArcGIS Pro).

1.4.3 Other relevant reports and datasets

This biodiversity assessment has been prepared with due consideration of the findings of previous biodiversity assessments for Gunlake Quarry (EMM, 2016) (EMM, 2021), which were considered as part of a broad review of background information.

This BDAR uses vegetation integrity (VI) plot data collected by EMM Consulting Pty Ltd (EMM) and with EMM's permission to inform the native vegetation assessment.

This BDAR also uses ground-truth vegetation mapping data of the Quarry, which was supplied by Gunlake, as a starting basis to inform the native vegetation assessment.

2 Legislative context

2.1 Commonwealth

2.1.1 *Environmental Protection and Biodiversity Conservation Act 1999*

The *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities, heritage places and water resources which are defined as MNES under the EPBC Act. These are:

- world heritage properties
- places listed on the National Heritage Register
- Ramsar wetlands of international significance
- threatened flora and fauna species and ecological communities
- migratory species
- Commonwealth marine areas
- the Great Barrier Reef Marine Park
- nuclear actions (including uranium mining)
- water resources, in relation to coal seam gas or large coal mining development.

Under the EPBC Act, an action that may have a significant impact on a MNES is deemed to be a 'controlled action' and can only proceed with the approval of the Commonwealth Minister for the Environment. An action that may potentially have a significant impact on a MNES is to be referred to DCCEEW for determination as to whether or not it is a controlled action. If deemed a controlled action, the project is assessed under the EPBC Act and a decision made as to whether or not to grant approval.

The Gunlake Quarry Extension Project (SSD 7090) was referred to the Commonwealth Minister for the Environment and determined to be a controlled action on 15 October 2015 (2015/7557). It was assessed under the assessment bilateral agreement with NSW and approved with conditions on 17 November 2017. The Secretary determined that the following controlling provisions apply:

- Listed threatened species and communities (Sections 18 & 18A of the EPBC Act).

There is little to no habitat for MNES within the subject land. The proposed development, being the proposed expansion of the Western Emplacement for the purpose of emplacement of uneconomic material, is not likely to result in a significant impact on MNES and as such does not require a modification of the EPBC Act approval or a new referral (refer to Section 11.1).

2.2 Legislative context (State)

2.2.1 *Environmental Planning and Assessment Act 1979*

The EP&A Act was enacted to encourage the consideration and management of impacts of proposed development or land-use changes on the environment and the community. The EP&A Act is administered by the NSW Department of Planning, Housing and Infrastructure (DPHI).

The EP&A Act provides the overarching structure for planning in NSW; however, is supported by other statutory environmental planning instruments (EPIs) including State Environmental Planning Policies (SEPPs). EPIs relevant to the natural environment are outlined further below.

2.2.1.1 Section 4.55(1A) modification

Development consents for SSD may be modified under section 4.55 of the EP&A Act provided the development as modified will be substantially the same development as the development for which consent was originally granted.

Gunlake is seeking to modify Development Consent SSD-12469087 pursuant to section 4.55(1A) of the EP&A Act.

2.2.1.2 *State Environmental Planning Policy (Biodiversity and Conservation) 2021*

State Environmental Planning Policy (Biodiversity and Conservation) 2021 (hereafter referred to as the Biodiversity and Conservation SEPP) aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for Koalas to ensure a permanent free-living population over their present range and reverse the current trend of Koala population decline. The Biodiversity and Conservation SEPP adopts two Chapters of relevance to Koala management, with Chapter 3 - *Koala habitat protection 2020*, and Chapter 4 - *Koala habitat protection 2021*.

The proposed development does not require approval from Council, and thus consideration of the Koala SEPP 2020 and Koala SEPP 2021 is not triggered.

2.2.2 *Biodiversity Conservation Act 2016*

The *Biodiversity Conservation Act 2016* (BC Act) is the legislation responsible for the conservation of biodiversity in NSW through the protection of threatened flora and fauna species, populations and ecological communities. The BC Act, together with the *Biodiversity Conservation Regulation 2017* (BC Regulation), establishes the BOS.

The BOS includes establishment of the BAM for use by accredited persons in biodiversity assessment under the scheme. The purpose of the BAM is to assess the impact of actions on threatened species and threatened ecological communities, and their habitats and determine offset requirements. For major projects, use of the BAM is mandatory, unless a BDAR waiver is granted.

The BAM sets out the requirements for a repeatable and transparent assessment of terrestrial biodiversity values on land in order to:

- identify the biodiversity values on land subject to proposed development area,
- determine the impacts of a proposed development, following all measures to avoid, minimise and mitigate impacts, and
- quantify and describe the biodiversity credits required to offset the residual impacts of proposed development on biodiversity values.

This BDAR has been undertaken in accordance with the requirements of the BAM. In particular, it follows the requirements of the streamlined assessment module for small area clearing as set out in Appendix C of the BAM.

2.2.3 *Fisheries Management Act 1994*

The *Fisheries Management Act 1994* (FM Act) contains provisions for the conservation of fish stocks, key fish habitat, biodiversity, threatened species, populations and ecological communities. It regulates the conservation of fish, vegetation and some aquatic macroinvertebrates and the development and sharing of the fishery resources of NSW for present and future generations.

The FM Act lists threatened species, populations and ecological communities, key threatening processes (KTPs) and declared critical habitat. Assessment guidelines to determine whether a significant impact is expected are detailed in section 220ZZ and 220ZZA of the FM Act.

Another objective of the FM Act is to conserve key fish habitat (KFH). These are defined as aquatic habitats that are important to the sustainability of recreational and commercial fishing industries, the maintenance of fish populations generally and the survival and recovery of threatened aquatic species. KFH is defined in Section 3.2.1 and 3.2.2 of the *Policy and Guidelines for Fish Conservation and Management* (DPI, 2013) .

There is little to no aquatic habitat within the subject land and, as such, the proposed development is unlikely to have a significant impact on threatened aquatic species, populations, communities, habitats and KFH. Aquatic matters are not assessed further in this biodiversity assessment.

2.2.4 *Biosecurity Act 2015*

The primary objective of the *Biosecurity Act 2015* is to provide a framework for the prevention, elimination and minimisation of biosecurity risks posed by biosecurity matter, dealing with biosecurity matter, carriers and potential carriers, and other activities that involve biosecurity matter, carriers or potential carriers.

The Biosecurity Act stipulates management arrangements for weed biosecurity risks in NSW, with the aim to prevent, eliminate and minimise risks. Management arrangements include:

- any land managers and users of land have a responsibility for managing weed biosecurity risks that they know about or could reasonably be expected to know about,
- applies to all land within NSW and all waters within the limits of the State, and
- local strategic weed management plans will provide guidance on the outcomes expected to discharge duty for the weeds in that plan.

The South East Regional Strategic Weed Management Plan 2023-2027 (LLS, 2022) sets out a regional approach to weed management for local government areas in the South East region including the Goulburn Mulwaree Council area. It identifies state and regional priority weeds and sets out the regulatory tools and recommended management priorities for each weed species (refer to Section 11.1.2).

2.2.5 *Water Management Act 2000*

Division 6 of the *Water Management Act 2000* (WM Act) requires consideration of controlled activities (i.e. activities within 40 m of riparian land) and aquifer interference activities. The NSW Aquifer Interference Policy (DPI, 2012) requires an assessment of potential impacts on groundwater users, including groundwater dependent ecosystems.

Groundwater is unlikely to be intercepted for the proposed development and, therefore, it does not represent an aquifer interference Activity. No further assessment of groundwater impacts is required for groundwater dependent ecosystems in this BDAR. The proposed development is not located within 40 m of a riverbank, lake shore or estuary and a controlled activity permit is not required.

3 Site context

3.1 Assessment area

The assessment area applied to the proposed development is the subject land plus all land within 1,500 m of the subject land boundary.

3.2 Landscape features

Landscape features have been identified in accordance with Section 3.1 of the BAM 2020. All identified landscape features are listed or described in Table 3-1, and shown on Figure 3-1.

Table 3-1: Landscape features

Landscape feature	Description
Interim Biogeographic Regionalisation of Australia (IBRA) region	South Eastern Highlands
IBRA subregion	Bungonia
Rivers and streams	The assessment area largely falls within the Chapmans Creek catchment. Chapmans Creek (4th order) and numerous 1st and 2nd order tributaries flow to the north east into Jaorimin Creek (5th order), which in turn flows north into the Wollondilly River (8th order). The assessment area also includes several 1st order tributaries and one 2nd order tributary that flow west into Lockyersleigh Creek (4th order), which in turn flows north into the Wollondilly River (8th order). There are no mapped rivers and streams within the subject land.
Estuaries and wetlands	There are no estuaries identified within the assessment area. There are no wetlands of significance mapped within the assessment area including Ramsar wetlands, wetlands registered on the DIWA, or coastal wetlands identified on the *State Environmental Planning Policy (Resilience and Hazards) 2021* planning maps.
Habitat connectivity	The subject land is located next to the existing Western Emplacement and is cleared of woody vegetation. Although it is proximate to patches of woodland and open forest vegetation, it has no direct connectivity to surrounding woody vegetation. The land within the broader assessment area is zoned RU1 Primary Production and RU2 Rural Landscape and has been widely cleared in the past for agriculture. The assessment area retains fragmented patches of woody habitat to the north and north west of the subject land, with contiguous woody habitats located to the east, south east and south of the Quarry pit. Immediately to the west of the pit and south west of the Western Emplacement are fragmented patches of regrowth. These habitats would provide movement for threatened species from the assessment area generally south to a large area of forest and woodland bounded by Lynwood Quarry, the railway corridor, Brayton Road and the township of Marulan.
Geological features	There are no karst, caves, crevices, cliffs, rocks or other geological features of significance within the subject land and assessment area.

Landscape feature	Description
Areas of outstanding biodiversity value	There are no Areas of Outstanding Biodiversity Value (AOBV), as declared by the NSW Minister for Energy and Environment, within the subject land or assessment area.
NSW (Mitchell) landscape	Although not required for assessment of small areas (Section 3.1.3 (10b) of the BAM), the subject land is located within the Wollondilly - Bindook Tablelands and Gorges Mitchell landscape.

3.3 Native vegetation cover

3.3.1 Method

The native vegetation cover within the assessment area was estimated using a combination of the following:

- aerial photography,
- regional mapping data (SVTM), and
- ground-validated vegetation mapping data of the Gunlake Quarry site.

Regional vegetation mapping was reviewed against aerial imagery and updated in areas of inconsistency. Ground-validated vegetation mapping data was used where available. Grassland areas denoted as “not classified” by the SVTM, and which were not informed by ground-validation, were categorised conservatively as native grassland (derived or otherwise), unless it was clear from aerial photography that they were cultivated.

3.3.2 Percent native cover within assessment area and patch size

Table 3-2 summaries the extent of native vegetation cover within the assessment area. Figure 3-1 shows native vegetation cover within the assessment area.

Table 3-2: Native vegetation cover in the assessment area

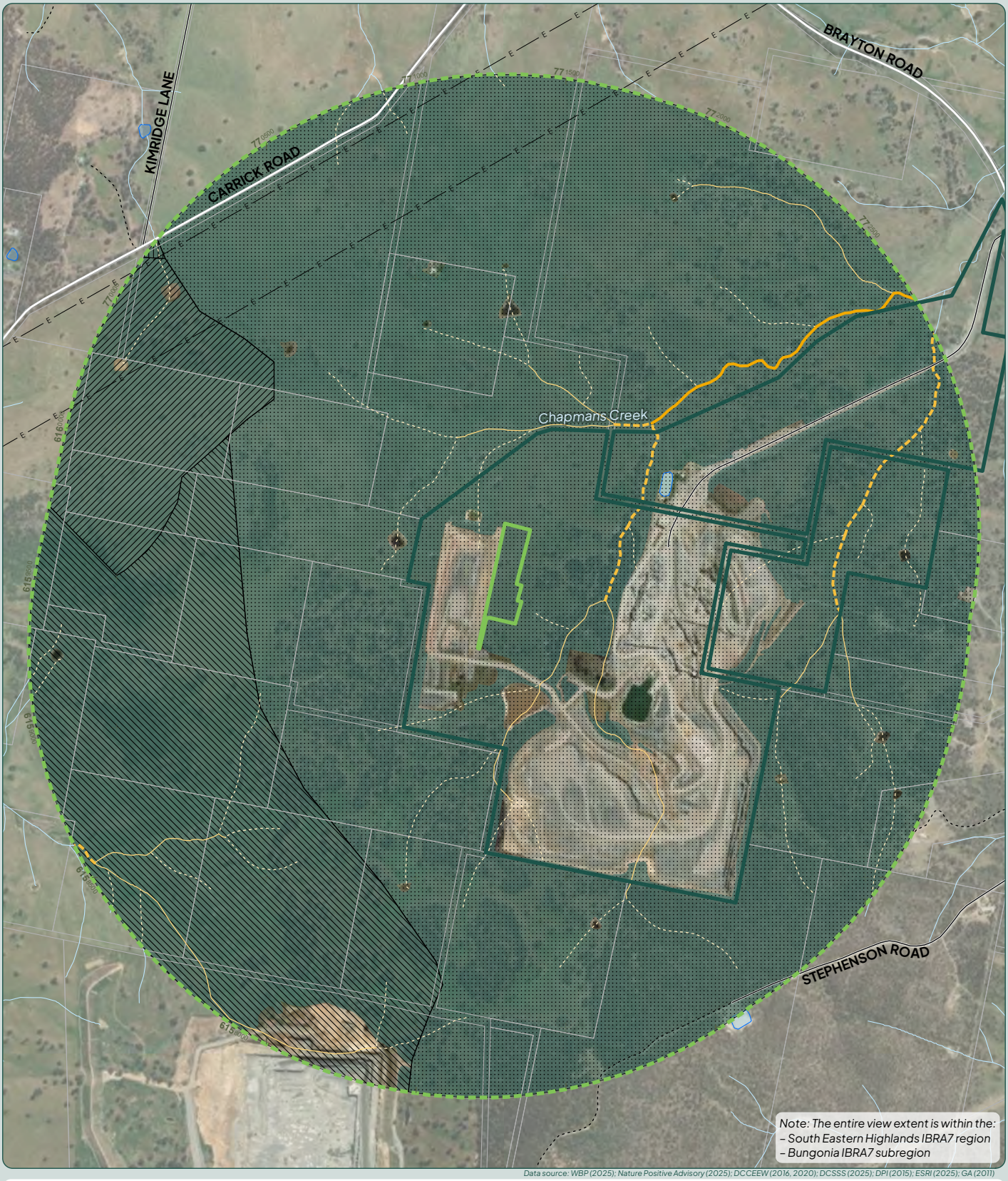
Assessment area (ha)	857.31
Total area of native vegetation cover (ha)	750.50
Percentage of native vegetation cover (%)	87.54%
Class (0-10, >10-30, >30-70 or >70%)	>70%

The patch size is used by the BAM calculator (BAM-C) to filter in threatened species. The maximum patch size of 101 ha has been conservatively applied to this assessment to filter in the maximum number of candidate species for consideration.

3.3.3 Native vegetation extent within subject land

The extent of native vegetation within the subject land is shown on Figure 3-2 and indicates that the entirety of the subject land is comprised of native vegetation representing derived native grassland.

Figure 3.1 | Location map



Data source: WBP (2025); Nature Positive Advisory (2025); DCCEEW (2016, 2020); DCSSS (2025); DPI (2015); ESRI (2025); GA (2011)

LEGEND

- Gunlake Quarry
- Subject land (3.00 ha)
- Subject land – 1,500 m buffer (857.31 ha)

Existing environment

- Electricity transmission line
- Minor road
- Local road
- Vehicular track
- Watercourse/drainage line
- Waterbody
- Lot boundary
- Native vegetation extent (750.50 ha) – comprises 87.54% of the 1,500 m buffer area

Strahler stream order

- 1st order
- 2nd order
- 3rd order
- 4th order

Mitchell landscape (DCCEEW (2016) v3.1)

- Crookwell Basalts and Sands (43.11 ha)
- Oberon - Kialla Granites (146.17 ha)
- Rockley Plains (0.24 ha)
- Wollondilly - Bindook Tablelands and Gorges (667.79 ha)

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N 0 250 500 m

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Figure prepared by: WARATAH BUSHFIRE PLANNING | GIS | ASSESSMENT

Path: D:_GIS_Working\NPA\N25006_Gunlake_BDAR\B_Maps\BDAR003_LocationMap_20251121_02\BDAR003_LocationMap_20251121_02.aprx

Figure 3.2 | Site map



Data source: WBP (2025); Nature Positive Advisory (2025); DCCEEW (2016, 2020); DCSSS (2025); DPI (2015); ESRI (2025); GA (2011)

LEGEND

- Gunlake Quarry
- Subject land (3.00 ha)
- Subject land – 1,500 m buffer (857.31 ha)

Existing environment

- Electricity transmission line
- Minor road
- Local road
- Waterbody
- Lot boundary
- Native vegetation extent

Mitchell landscape (DCCEEW (2016) v3.1)

- Wollondilly - Bindook Tablelands and Gorges

Strahler stream order

- 1st order
- 2nd order
- 3rd order



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N | 0 | 50 | 100 m

Disclaimer: mapping is indicative only & data shown has an inherent level of inaccuracy (dependent on the data source). Location of mapped features & boundaries should be confirmed by a registered surveyor.

Figure prepared by: WARATAH BUSHFIRE PLANNING | GIS | ASSESSMENT

Path: D:_GIS_Working\NPA\N25006_Gunlake_BDAR\B_Maps\BDAR004_SiteMap_20251121_02\BDAR004_SiteMap_20251121_02.aprx

4 Native vegetation, threatened ecological communities and vegetation integrity

4.1 Methods

4.1.1 Desktop review

Gunlake Quarry has been extensively surveyed for earlier project approvals and vegetation data exists. A desktop review of existing vegetation data derived from earlier studies for the Gunlake Extension Project (SSD-7090) and Gunlake Quarry Continuation Project (SSD-12469087) was undertaken to understand the PCTs and vegetation conditions previously identified in the Quarry and subject land.

4.1.2 Field assessment

4.1.2.1 Vegetation mapping

Vegetation mapping was undertaken during a site visit on 9 December 2024. The subject land was traversed on foot and existing vegetation mapping was ground-truthed and validated to confirm the PCTs present and stratify vegetation into zones reflecting broad vegetation condition states. One vegetation zone was defined for this assessment:

- **DNG**: This is a grassland community derived from the clearing of the woody component of the original open forest or woodland community. The tree and shrub strata are missing, and the dominant stratum is the ground layer, which is dominated by grass species. This vegetation zone includes scattered trees and shrubs.

4.1.2.2 Vegetation integrity assessment (plot-based vegetation survey)

Native VI was assessed using data obtained via a series of plots, as per the methodology outlined in Section 4.2 of the BAM. Plots used to inform this BDAR were collected across two separate trips:

- One plot was completed within the subject land by Isaac Mammott (Sclerophyll Flora Surveys and Research) and Nathan Garvey (Nature Positive Advisory) on 9 December 2024 ('GunlakePL03').
- Two plots were completed within the subject land by EMM on 28 June 2023 ('731D003' and '731D004').

At each plot location (Figure 4-1) the following was undertaken:

- one 20 x 20 m plot, for assessment of composition and structure, and
- one 20 x 50 m plot for assessment of function, including a series of five 1 x 1 m plots to assess average leaf litter cover.

The assessment of composition and structure, based on 20 x 20 m plot, recorded species name, stratum, growth form, cover and abundance rating for each species present within the plot. Cover (foliage cover) was estimated for all species rooted in or overhanging the plot, and recorded using decimals (if less than 1%, rounded to whole number (1-5%) or estimated to the nearest 5% (5-100%). Abundance was counted (up to 20) and estimated above 20, and recorded using the following intervals: 1, 2, 3, 4, 5, 10, 20, 50, 100, 500, 1,000, 1,500, 2,000 etc.

The assessment of function recorded the number of large trees, the presence of tree stem size class, tree regeneration, number of trees with hollows and length of fallen logs, as well as leaf litter cover within the 20 x 50 m plot and five 1 x 1 m subplots. The minimum number of plots and transects per vegetation zone was determined using Table 3 of the BAM. Datasets and compiled plot data are provided in Appendix B.

Figure 4.1 | Plant community types, vegetation zones and plot locations



Data source: WBP (2025); Nature Positive Advisory (2024; 2025); DCSSS (2025); EMM (2024); ESRI (2025); GA (2011)

LEGEND

- Subject land (3.00 ha)
- Watercourse/drainage line
- Lot boundary

BAM plot

- EMM (2023)
- NPA (2024)

PCT 3738 | Goulburn-Lithgow Tableland Hills Grassy Forest

- Derived native grassland (DNG)

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N 0 25 50 m

Disclaimer: mapping is indicative only & data shown has an inherent level of inaccuracy (dependent on the data source). Location of mapped features & boundaries should be confirmed by a registered surveyor.

Figure prepared by: WARATAH BUSHFIRE PLANNING | GIS | ASSESSMENT

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4.2 Results

4.2.1 Plant community types

The dominant PCT on the subject land is PCT 731 (Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills, South Eastern Highlands Bioregion). There are no other PCTs present on the subject land.

PCT 731 was previously identified within the Quarry and the subject land and was applied to earlier assessments relating to the Gunlake Extension Project (SSD-7090) and Gunlake Quarry Continuation Project (SSD-12469087). When the revised PCTs in eastern NSW came into effect and the BAM-C was subsequently updated on 14 April 2023, PCT 731 became unavailable for new assessments.

PCT 3738 (Goulburn-Lithgow Tableland Hills Grassy Forest) has been selected to replace PCT 731 in this BDAR. Justification of PCT selection is provided in Section4.2.2.3 below. Its extent is shown on Figure 4-1.

Table 4-1: PCTs identified within the subject land

PCT ID	PCT name	Area (ha)
3738	Goulburn-Lithgow Tableland Hills Grassy Forest	3.00

4.2.2 PCT 3738 Goulburn-Lithgow Tableland Hills Grassy Forest

4.2.2.1 PCT overview

An overview of PCT 3738 and a brief description of its occurrence within the subject land is provided below.

PCT ID	3738
PCT name	Goulburn-Lithgow Tableland Hills Grassy Forest
Vegetation formation	Dry Sclerophyll Forests (Shrubby sub-formation)
Vegetation class	Southern Tableland Dry Sclerophyll Forest
Per cent cleared value (%)	68.60
Extent within subject land (ha)	3.00

This PCT occurs across the entire subject land as a derived grassland community.

Canopy trees occur within the subject land as scattered trees, with only Thin-leaved Stringybark (*Eucalyptus eugenioides*) present. In surrounding areas, outside the subject land, this PCT also supports Parramatta Wattle (*Acacia parramattensis*).

A sparse midstorey occurs comprised of Peach Heath (*Lissanthe strigosa*) and Sifton Bush (*Cassinia sifton*).

The groundcover is heavily disturbed due to past land use history and is dominated by exotic species. Exotic groundcover species include high-threat exotic species Serrated Tussock (*Nassella trichotoma*) and Sheep Sorrel (*Acetosella vulgaris*), with other abundant weed species including Rat's Tail Fescue (*Vulpia myuros*), Cocksfoot (*Dactylis glomerata*) and Catsear (*Hypochaeris radicata*).

Where present, native species include:

- Smallflower Wallaby Grass (*Rytidosperma setaceum*),
- *Juncus subsecundus*,
- Shorthair Plumegrass (*Dichelachne micrantha*),
- *Rytidosperma racemosum*,
- Small St. John's Wort (*Hypericum gramineum*),
- Wattle Mat-rush (*Lomandra filiformis*),
- Paddock Lovegrass (*Eragrostis leptostachya*),
- Weeping Grass (*Microlaena stipoides*),
- Yellow Autumn-lily (*Tricoryne elatior*),
- Common Everlasting (*Chrysocephalum apiculatum*),
- *Acaena ovina*,
- Common Wheatgrass (*Anthosachne scabra*),
- Speargrass (*Austrostipa scabra* subsp. *falcata*),
- Climbing Saltbush (*Einadia nutans*),
- Cotton Fireweed (*Senecio quadridentatus*),
- *Euchiton sphaericus*,
- Native Geranium (*Geranium solanderi*),
- Kangaroo Grass (*Themeda triandra*), and
- Tufted Bluebell (*Wahlenbergia communis*).



Photo 4-1: PCT 3738 Goulburn-Lithgow Tableland Hills Grassy Forest

4.2.2.2 Condition states

This PCT occurs across the entire subject land as a derived grassland community. This is a grassland community derived from the clearing of the woody component of the original open forest or woodland community. The tree and shrub strata are missing, and the dominant stratum is the ground layer dominated by grass species, with a high proportion of this cover comprising exotic groundcover (approximately 80%). This vegetation zone includes scattered trees and shrubs.

4.2.2.3 Justification of PCT selection

All plot data collected from PCT 731 within the Quarry was considered and analysed to select an alternative PCT. The following approaches were used to identify and select the best-fit PCT to replace PCT 731:

- Reviewing the PCT lineage report.
- Using the PCT filter tool in BioNet Vegetation Classification to identify PCTs with the most matches to PCT 731 survey data from the Quarry, based on IBRA subregion and 19 species recorded.
- Applying the Plot to PCT tool.

Based on careful consideration of the data, PCT 3738 was selected as the best-fit replacement for PCT 731. Key findings are described below.

Lineage report in BioNet Vegetation Classification

Lineage data in the BioNet Vegetation Classification indicates that PCT 731 was split into PCT 3738 and PCT 3374 in June 2022. PCT 3738 was considered a marginally better fit compared with PCT 3374 based on:

- a higher floristic match between plot data and characteristic species,
- a higher floristic match between plot data and characteristic species in the tree growth form, and
- IBRA subregion; PCT 3378 occurs within the Bungonia subregion whereas PCT 3374 does not.

PCT Filter Tool

The PCT filter tool indicates that the two PCTs with the highest matches to PCT 731 are PCT 3373 and PCT 3738. These two PCTs are very similar; both occur in the Bungonia subregion on sedimentary and granitic substrates, and on gentle to low undulating hills. Both PCTs are floristically similar. PCT 3738 can transition into PCT 3373 on lower slopes and foot slopes where accumulated soils are deeper.

Whilst PCT 3738 is described as a shrubby dry sclerophyll open forest and PCT 3373 as a grassy dry sclerophyll open forest to woodland, the vegetation in the subject land and the Quarry landscape more broadly are highly modified, and this characteristic is not informative for PCT selection, noting presence of a shrub layer in PCT 731 across the Quarry.

None of the characteristic tree species with the highest median cover score described for PCT 3373 and 3738 were recorded in PCT 731 on the Quarry (i.e. Yellow Box *Eucalyptus melliodora*, and Broad-leaved Peppermint *Eucalyptus dives* or Brittle Gum *Eucalyptus mannifera* respectively).

Thin-leaved Stringybark (*Eucalyptus eugenioides*) and Parramatta Wattle (*Acacia parramattensis*) are characteristic species for both PCT 3373 and PCT 3738. However, these characteristic tree species have a higher median cover score for PCT 3738 than for PCT 3373. PCT 3738 was considered a marginally better fit on this basis.

Plot to PCT tool

The PCT matching outputs of the plot to PCT tool were uninformative, with none of the PCT centroid matches falling within the distance to centroid threshold of 0.695. This result may reflect the highly modified nature of the Quarry landscape and the long history of site disturbance affecting the species richness of the vegetation.

The PCT with the lowest distance to centroid is PCT 3325, which is a Ribbon Gum (*Eucalyptus viminalis*) grassy forest that occurs along creek flats in valleys of the South Coast hinterlands. This is not a suitable replacement for PCT 731 and indicates that the outputs of the plot to PCT tool are unreliable for this dataset.

4.2.2.4 Alignment with TECs

PCT 3738 is not associated with a BC Act-listed or EPBC Act-listed Threatened Ecological Community (TEC) within the BioNet Vegetation Classification.

4.3 Vegetation zones

One vegetation zone was identified within the subject land: PCT 3738_DNG (see Table 4-2 and Figure 4-1). The maximum patch size of 101 ha has been conservatively applied to this assessment to filter in the maximum number of candidate species for consideration.

Table 4-2: Vegetation zones and patch sizes

Vegetation zone ID	PCT ID number & name	Condition / other defining feature	Area (ha)	Patch size class (select multiple if areas of native vegetation are discontinuous)	No. vegetation integrity plots required	No. vegetation integrity plots completed	No. vegetation integrity plots used in assessment	Plot IDs of vegetation integrity plots used in assessment
3738_DNG	3738 | Goulburn-Lithgow Tableland Hills Grassy Forest	DNG	3.00	☐ <5 ha ☐ 5-24 ha ☐ 25-100 ha ☒ >100 ha	2	3	3	GunlakePL03 731D003 731D004

4.4 Vegetation integrity (vegetation condition)

4.4.1 Vegetation integrity survey plots

A total of six plots were collected in the 3738_DNG vegetation zone across the Quarry area.

Three of the six plots were used in this assessment (i.e. GunlakePL03, 731D003, and 731D004) as they are located within the subject land. The remaining three are located outside of the subject land and have not been applied to this assessment.

4.4.2 Scores

The VI score for 3738_DNG is 9.7. The low VI score for this vegetation zone reflects the high level of site disturbance and the dominance of non-native weed species, including high-threat species Serrated Tussock (*Nassella trichotoma*).

Table 4-3: Vegetation integrity scores

Vegetation zone ID	Composition condition score	Structure condition score	Function condition score (where relevant)	Vegetation integrity score	Hollow bearing trees present?
3738_DNG	40.9	22.2	0.1	9.7	No

4.4.3 Use of benchmark data

The source of benchmark data that was used to assess vegetation integrity attributes is the BioNet Vegetation Classification and as automatically populated in the BAM-C (last updated 14/03/2024, version 65).

5 Habitat suitability for threatened species

5.1 Identification of threatened species for assessment

5.1.1 Ecosystem credit species

A list of ecosystem credit species predicted to occur within the subject land, based on the PCTs present and generated by the calculator associated within the BAM is provided in Table 5-1. The potential for these species to occur within the subject land was assessed in accordance with Section 5.2.2 of the BAM.

Table 5-1: Predicted ecosystem credit species

Common name	Scientific name	BC Act Listing Status	EPBC Act Listing Status	Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
Artamus cyanopterus cyanopterus	Dusky Woodswallow	Vulnerable	Not Listed	No	BAM-C	Yes	n/a	3738_DNG	Moderate
Callocephalon fimbriatum	Gang-gang Cockatoo (foraging)	Endangered	Endangered	Yes	BAM-C	Yes	n/a	3738_DNG	Moderate
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo (foraging)	Vulnerable	Vulnerable	Yes	BAM-C	No	Habitat constraints – *Presence of Allocasuarina and casuarina species* No *Allocasuarina* or *Casuarina* species are located within the subject land.	3738_DNG	High
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Vulnerable	Vulnerable	No	BAM-C	Yes	n/a	3738_DNG	High
Daphoenositta chrysoptera	Varied Sittella	Vulnerable	Not Listed	No	BAM-C	Yes	n/a	3738_DNG	Moderate
Dasyurus maculatus	Spotted-tailed Quoll	Vulnerable	Endangered	No	BAM-C	Yes	n/a	3738_DNG	High
Falco subniger	Black Falcon	Vulnerable	Not Listed	No	BAM-C	Yes	n/a	3738_DNG	Moderate

Common name	Scientific name	BC Act Listing Status	EPBC Act Listing Status	Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
Grantiella picta	Painted Honeyeater	Vulnerable	Vulnerable	No	BAM-C	No	Habitat constraints – *Mistletoes present at a density of greater than five mistletoes per hectare* No mistletoes are present within the subject land.	3738_DNG	Moderate
Haliaeetus leucogaster	White-bellied Sea-Eagle (foraging)	Vulnerable	Not Listed	Yes	BAM-C	Yes	n/a	3738_DNG	High
Hieraaetus morphnoides	Little Eagle	Vulnerable	Not Listed	Yes	BAM-C	Yes	n/a	3738_DNG	Moderate
Hirundapus caudacutus	White-throated Needletail	Vulnerable	Vulnerable	No	BAM-C	Yes	n/a	3738_DNG	High
Lathamus discolor	Swift Parrot (foraging)	Endangered	Critically Endangered	Yes	BAM-C	Yes	n/a	3738_DNG	Moderate
Melanodryas cucullata cucullata	South-eastern Hooded Robin	Endangered	Endangered	No	BAM-C	Yes	n/a	3738_DNG	Moderate
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Vulnerable	Not Listed	No	BAM-C	Yes	n/a	3738_DNG	Moderate

Common name	Scientific name	BC Act Listing Status	EPBC Act Listing Status	Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
Pachycephala olivacea	Olive Whistler	Vulnerable	Not Listed	No	BAM-C	Yes	n/a	3738_DNG	Moderate
Parvipsitta pusilla	Little Lorikeet	Vulnerable	Not Listed	No	BAM-C	Yes	n/a	3738_DNG	High
Petroica boodang	Scarlet Robin	Vulnerable	Not Listed	No	BAM-C	Yes	n/a	3738_DNG	Moderate
Petroica phoenicea	Flame Robin	Vulnerable	Not Listed	No	BAM-C	Yes	n/a	3738_DNG	Moderate
Pteropus poliocephalus	Grey-headed Flying-fox (foraging)	Vulnerable	Vulnerable	Yes	BAM-C	Yes	n/a	3738_DNG	High
Pycnoptilus floccosus	Pilotbird	Vulnerable	Vulnerable	No	BAM-C	No	Geographic limitations – *South of Kings Highway* The subject land is located north of the Kings Highway.	3738_DNG	Moderate
Pyrrholaemus sagittatus	Speckled Warbler	Vulnerable	Not Listed	No	BAM-C	Yes	n/a	3738_DNG	High
Stagonopleura guttata	Diamond Firetail	Vulnerable	Vulnerable	No	BAM-C	Yes	n/a	3738_DNG	Moderate
Varanus rosenbergi	Rosenberg's Goanna	Vulnerable	Not Listed	No	BAM-C	Yes	n/a	3738_DNG	High

5.1.2 Species credit species

The candidate species predicted by the BAM-C are shown in Table 5-2. An assessment of the geographic and landscape constraints has been provided for each species, with a justification provided where species have been excluded, in accordance with Steps 1 to 3 (Section 5.2.1 to 5.2.3) of the BAM.

As this BDAR is being prepared in accordance with Appendix C (streamlined assessment module – small area) of the BAM, only candidate species at risk of serious and irreversible impact (SAII) are predicted by the BAM-C. These are the species that require assessment.

All species credits species requiring assessment can be excluded from requiring further assessment:

- Habitat constraints for the Large-eared Pied Bat (*Chalinolobus dwyeri*) and Brush-tailed Rock-wallaby (*Petrogale penicillata*) do not occur within 2 km of the subject land.
- The subject land is not mapped as mapped important habitat for the Swift Parrot (*Lathamus discolor*).
- Suitable microhabitats for the Stuttering Frog (*Mixophyes balbus*) do not occur within 500 m of the subject land.

No targeted threatened species surveys are required. No species credit species have been incidentally observed in the subject land.

Table 5-2: Predicted species credit species at risk of SAII

Common name	Scientific name	BC Act Listing Status	EPBC Act Listing Status	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
Chalinolobus dwyeri	Large-eared Pied Bat	Endangered	Endangered	BAM-C	No	Habitat constraints – *Within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within two kilometres of old mines or tunnels*	3738_DNG
Lathamus discolor	Swift Parrot	Endangered	Critically Endangered	BAM-C	No	Habitat constraints – *As per Important Habitat Map*	3738_DNG
Mixophyes balbus	Stuttering Frog	Endangered	Vulnerable	BAM-C	No	Microhabitats – Rainforest and wet, tall open forest habitats in the foothills and escarpments in south east NSW (OEH, 2025). Non-breeding microhabitat: deep leaf litter and thick understorey vegetation on the forest floor. Breeding microhabitat: rock shelves and shallow riffles in small, flowing steams (OEH, 2025). Requires deep permanent pools for tadpole development (OEH, 2025).	3738_DNG

Common name	Scientific name	BC Act Listing Status	EPBC Act Listing Status	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
Petrogale penicillata	Brush-tailed Rock-wallaby	Endangered	Vulnerable	BAM-C	No	Habitat constraints – *Land within 1 km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or cliffflines.*	3738_DNG

6 Identifying prescribed impacts

An assessment of prescribed impacts is provided in Table 6-1.

Table 6-1: Prescribed impacts identified

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature
Karst, caves, crevices, cliffs, rocks or other geological features of significance	☐ Yes / ☒ No	N/A	N/A
Human-made structures	☐ Yes / ☒ No	N/A	N/A
Non-native vegetation	☐ Yes / ☒ No	Derived grassland contains a high proportion of non-native groundcover species including high threat weed species (see Section 4.2.2).	Unlikely to provide habitat for any of the SAII species identified in Table 5-2.
Habitat connectivity	☐ Yes / ☒ No	The subject land is located next to the existing Western Emplacement and is cleared of woody vegetation. Although it is proximate to patches of woodland and open forest vegetation, it has no direct connectivity to surrounding woody vegetation.	Unlikely to function as a valuable movement corridor for SAII species identified in Table 5-2.
Waterbodies, water quality and hydrological processes	☐ Yes / ☒ No	No permanent creeks, streams or standing bodies of water are present within the subject land. Any impacts of the proposed development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities within the locality would be minimal, due to its isolated location and minor extent within the subject land.	N/A
Wind turbine strikes	☐ Yes / ☒ No	N/A	N/A
Vehicle strikes	☐ Yes / ☒ No	N/A	N/A

Stage 2: Impact assessment (biodiversity values and prescribed impacts)

7 Avoid and minimise impacts

7.1 Direct and indirect impacts

The key measure to avoid and minimise impacts has been through iterative design of the expanded Western Emplacement. Figure 7-1 shows the original design of the expanded emplacement area areas versus the final design.

The original design would have resulted in impacts to areas of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions critically endangered ecological community (CEEC), including areas meeting the definitions for listing under both the BC Act and EPBC Act. The original design would also have resulted in impacts to woodland areas of PCT 3738 in higher condition.

The final design is sited to ensure impacts are restricted to the removal of highly modified DNG that has a low vegetation integrity score (see Section 8.1.2) and is dominated by weeds, including high threat weeds.

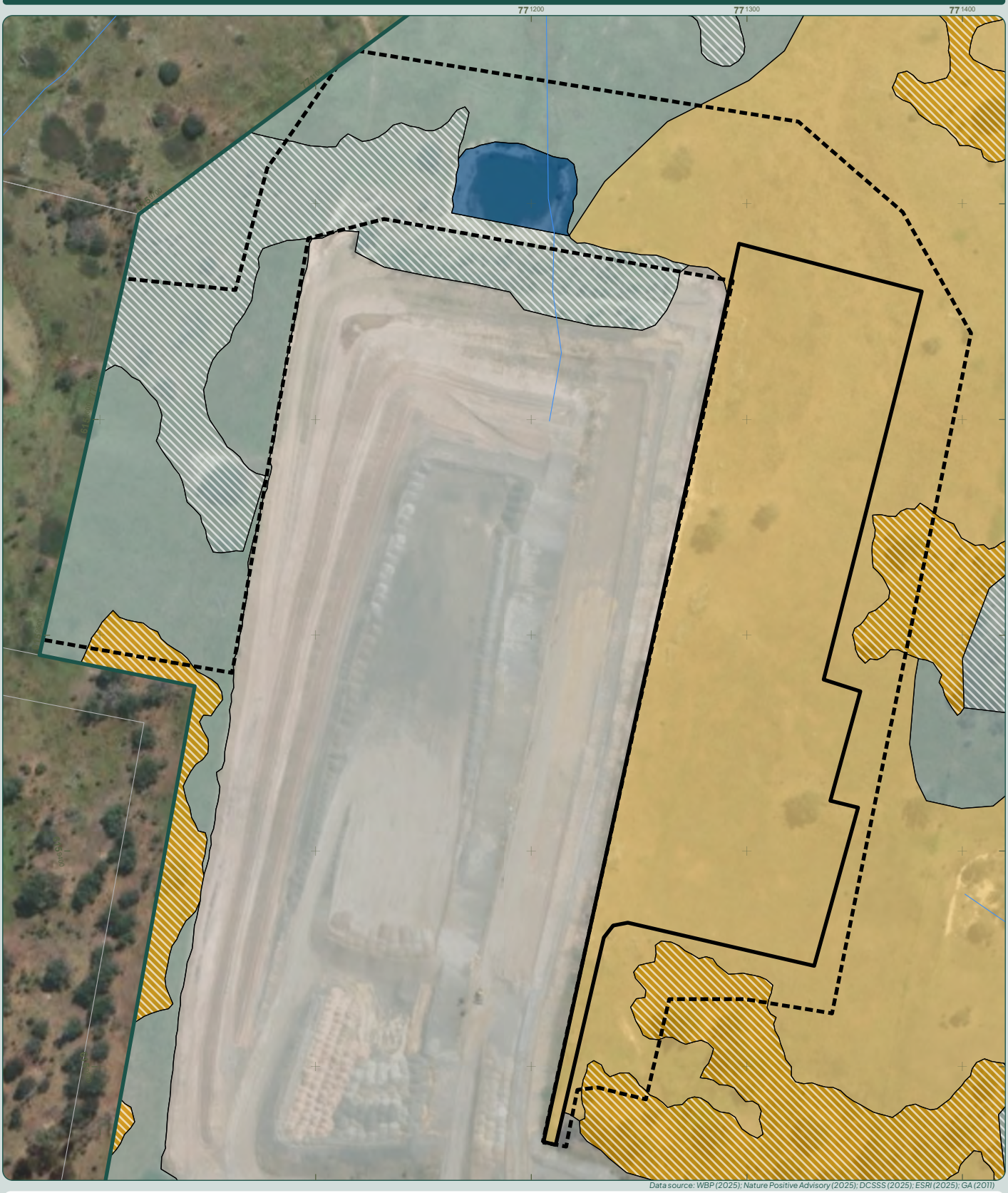
Further to the above, the area of impact is in proximity to the existing Western Emplacement and will utilise the existing haul road for the transportation of overburden. This will minimise further impacts associated with creation of new access roads.

The area of impact has also been limited to a very small area that is less than 3.00 ha.

7.2 Prescribed impacts

No prescribed impacts were identified in Section 6.

Figure 7.1 | Measures to avoid and minimise impacts



Data source: WBP (2025); Nature Positive Advisory (2025); DCSSS (2025); ESRI (2025); GA (2011)

LEGEND

- Gunlake Quarry
- Subject land (3.00 ha)
- Original subject land boundary (7.91 ha)
- Watercourse/drainage line
- Lot boundary
- Dam
- Disturbed

PCT 1330 | Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion

- Derived native grassland (DNG)
- Woodland

PCT 3738 | Goulburn-Lithgow Tableland Hills Grassy Forest

- Derived native grassland (DNG)
- Woodland

NaturePositive Advisory

Gunlake Small Area Biodiversity Development Assessment Report

21/11/2025 (v2) 1:2,500 @A4 GDA2020 MGA Zone 55

N 0 25 50 m

Disclaimer: mapping is indicative only & data shown has an inherent level of inaccuracy (dependent on the data source). Location of mapped features & boundaries should be confirmed by a registered surveyor.

Figure prepared by: WARATAH BUSHFIRE PLANNING | GIS | ASSESSMENT

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8 Impact assessment

8.1 Direct impacts

8.1.1 Residual direct impacts

The residual direct impacts likely to occur on the subject land after steps are taken to avoid and minimise impacts are summarised in Table 8-1.

Table 8-1: Summary of residual direct impacts

Direct impact	BC Act status	EPBC Act status	SAII entity	Project phase / timing of impact	Extent
Vegetation clearing – removal of PCT 3738 derived native grassland	Not listed	Not listed	No	Construction	3.00 ha
Removal of hollow-bearing trees	Not listed	Not listed	No	Construction	2 trees with hollows <5 cm diameter and ~20 cm diameter (respectively)

8.1.2 Change in vegetation integrity score

The impact of the proposed development on vegetation integrity and threatened species habitat has been assessed in accordance with subsection 8.1.1 of the BAM (DPIE 2020) and is summarised in Table 8-2.

Table 8-2: Impacts to vegetation integrity

Vegetation zone	PCT ID	Management zone	Area (ha)	Before development				After Development				Change
				Composition	Structure	Function	VI score	Composition	Structure	Function	VI Score	Change in VI Score
3738_DNG	3738	n/a	3.00	40.9	22.2	0.1	9.7	0	0	0	0	-9.7

8.2 Indirect impacts and mitigation

The residual indirect impacts likely to occur on the subject land after steps are taken to avoid and minimise impacts are summarised in Table 8-3.

Table 8-3: Summary of residual indirect impacts

Indirect impact	Impacted entities	Extent	Frequency	Duration	Project phase / timing	Likelihood and consequences
Transport of weeds from the subject land to adjacent vegetation	Retained areas of PCT 3738 Box Gum Woodland CEEC	Areas immediately adjacent to the subject land	Ongoing	Ongoing	Construction, operation, rehabilitation	Degradation of retained vegetation by weeds including high threat and priority weed species, particularly on areas of Box Gum Woodland CEEC within the Quarry.
Erosion and sedimentation impacts caused by vegetation removal and material emplacement and shaping	Retained areas of PCT 3738 Box Gum Woodland CEEC	Areas immediately adjacent to the subject land	Ongoing	Ongoing	Construction, operation, rehabilitation	Degradation of retained vegetation by accumulation of sediments and eroded material, particularly retained woodland areas of PCT 3738 and areas of Box Gum Woodland CEEC adjacent to the subject land.

8.3 Prescribed impacts

No prescribed impacts were identified in Section 6.

8.4 Mitigating residual impacts – management measures and implementation

The measures proposed to mitigate residual impacts likely to occur on the subject land after steps are taken to avoid and minimise impacts are summarised in Table 8-4.

Table 8-4: Summary of proposed mitigation and management measures for residual impacts

Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
Weed management	Undertake weed management in accordance with the Gunlake Quarry Rehabilitation and Biodiversity Offset Management Plan (Gunlake Quarries, 2015).	Annual	Once per year	Gunlake Quarry	High Weed impacts from the emplacement areas are likely to be low. If weed management controls are not implemented there is potential for weed spread to occur.	Box Gum Woodland CEEC (outside the subject land)
Erosion and sediment controls	Implement erosion and sediment controls in accordance with the Gunlake Quarry Soil and Water Management Plan (Gunlake Quarries, 2021a).	Ongoing	Ongoing	Gunlake Quarry	High Erosion and sediment controls have been largely successful within the Quarry to date. If erosion and sediment controls are not maintained there is risk of impacts occurring.	Box Gum Woodland CEEC (outside the subject land)
Felling of hollow-bearing trees	A suitably qualified ecologist will be present during clearing of the two hollow-bearing trees. The tree will be knocked by an excavator or similar before being carefully pushed over. Any fauna disturbed will be captured and relocated to retained vegetation. If injured, they will be taken to a vet before being released into retained vegetation	During clearing	Once	Gunlake Quarry	High Injuries to fauna can occur during clearing works, but are reasonably rare	Nil

9 Serious and irreversible impacts

9.1 Assessment for serious and irreversible impacts on biodiversity values

Section 9.1.1 of the BAM requires additional assessment for TECs and threatened species that are also listed as candidate entities that are at risk of SAII. No SAII entities are likely to occur on the subject land and therefore no further assessment is required.

10 Impact summary

10.1 Determine an offset requirement for impacts

10.1.1 Impacts on native vegetation and TECs or ECs (ecosystem credits)

In accordance with Section 9.2.1(1) of BAM, impacts on vegetation zones and threatened species habitat do not require offsets where:

- a vegetation zone representative of a critically endangered or endangered ecological community has a vegetation integrity score less than 15, and/or
- a vegetation zone representative of a vulnerable ecological community and/or threatened species habitat has a vegetation integrity score less than 17, and/or
- a vegetation zone that is not listed has a vegetation integrity score less than 20.

Table 10-1 provides a summary of the vegetation zones that do not trigger the above thresholds. There are no impacts to vegetation zones that require offsets.

Table 10-1: Impacts that do not require offset – ecosystem credits

Vegetation zone	PCT name	TEC	Impact area (ha)	TEC association	Entity at risk of an SAII?	Current VI score
3738_DNG	3738 | Goulburn-Lithgow Tableland Hills Grassy Forest	Not a TEC	3.00	N/A	No	9.7

10.1.2 Impacts on threatened species and their habitat (species credit)

There are no impacts on threatened species (species credits) that require an offset as per BAM subsection 9.2.2(2).

10.2 Impacts that do not require further assessment

There are no impacts identified that do not need further assessment.

11 Assessment of other relevant biodiversity legislation

11.1 Environment Protection and Biodiversity Conservation Act 1999

11.1.1 Likelihood of occurrence assessment

Two CEECs have potential to occur based on a PMST report:

- Natural Temperate Grassland of the South Eastern Highlands
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

Neither of these CEECs are present within the subject land and are unlikely to be impacted by the proposed development.

Forty-three threatened and migratory species have potential to occur on the subject land based on the PMST report. These species are shown in Table 11-1. None of these species are likely to occur within the subject land and so are unlikely to be impacted by the proposed development.

The proposed development will not result in any direct impacts on TECs, or threatened and migratory species listed under the EPBC Act and will not result in significant impacts on MNES. Referral of the proposed development to DCCEEW is not required.

Table 11-1: Threatened and migratory species predicted to occur on the subject land

Scientific Name	Common Name	Threat status	Migratory Status	Occurrence within subject land
Bird				
Actitis hypoleucos	Common Sandpiper		Migratory	Unlikely – no suitable habitat present
Anthochaera phrygia	Regent Honeyeater	Critically Endangered		Unlikely – no suitable foraging habitat present
Aphelocephala leucopsis	Southern Whiteface	Vulnerable		Unlikely – no suitable habitat present
Apus pacificus	Fork-tailed Swift		Migratory	Unlikely – no suitable habitat present
Botaurus poiciloptilus	Australasian Bittern	Endangered		Unlikely – no suitable habitat present
Calidris acuminata	Sharp-tailed Sandpiper	Vulnerable	Migratory	Unlikely – no suitable habitat present
Calidris ferruginea	Curlew Sandpiper	Critically Endangered	Migratory	Unlikely – no suitable habitat present
Calidris melanotos	Pectoral Sandpiper		Migratory	Unlikely – no suitable habitat present
Callocephalon fimbriatum	Gang-gang Cockatoo	Endangered		Unlikely – no suitable habitat present

Scientific Name	Common Name	Threat status	Migratory Status	Occurrence within subject land
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	Vulnerable		Unlikely – no suitable habitat present
Climacteris picumnus victoriae	Brown Treecreeper (south-eastern)	Vulnerable		Unlikely – no suitable habitat present
Falco hypoleucos	Grey Falcon	Vulnerable		Unlikely – no suitable habitat present
Gallinago hardwickii	Latham's Snipe, Japanese Snipe	Vulnerable	Migratory	Unlikely – no suitable habitat present
Grantiella picta	Painted Honeyeater	Vulnerable		Unlikely – no suitable habitat present
Hirundapus caudacutus	White-throated Needletail	Vulnerable	Migratory	Unlikely – no suitable habitat present
Lathamus discolor	Swift Parrot	Critically Endangered		Unlikely – no suitable foraging habitat present
Melanodryas cucullata cucullata	South-eastern Hooded Robin, Hooded Robin (south-eastern)	Endangered		Unlikely – no suitable habitat present
Motacilla flava	Yellow Wagtail		Migratory	Unlikely – no suitable habitat present
Neophema chrysostoma	Blue-winged Parrot	Vulnerable		Unlikely – no suitable habitat present
Pandion haliaetus	Osprey		Migratory	Unlikely – no suitable habitat present
Polytelis swainsonii	Superb Parrot	Vulnerable		Unlikely – no suitable habitat present
Pycnoptilus floccosus	Pilotbird	Vulnerable		Unlikely – no suitable habitat present
Rostratula australis	Australian Painted Snipe	Endangered		Unlikely – no suitable habitat present
Stagonopleura guttata	Diamond Firetail	Vulnerable		Unlikely – no suitable habitat present
Fish				
Macquaria australasica	Macquarie Perch	Endangered		Unlikely – no suitable habitat present
Mammal				
Chalinolobus dwyeri	Large-eared Pied Bat, Large Pied Bat	Endangered		Unlikely – no suitable habitat present

Scientific Name	Common Name	Threat status	Migratory Status	Occurrence within subject land
Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)	Endangered		Unlikely – no suitable habitat present
Petauroides volans	Greater Glider (southern and central)	Endangered		Unlikely – no suitable habitat present
Petaurus australis australis	Yellow-bellied Glider (south-eastern)	Vulnerable		Unlikely – no suitable habitat present
Petrogale penicillata	Brush-tailed Rock-wallaby	Vulnerable		Unlikely – no suitable habitat present
Phascolarctos cinereus **(combined populations of Qld, NSW and the ACT)**	Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)	Endangered		Unlikely – no suitable habitat present
Pseudomys novaehollandiae	New Holland Mouse, Pookila	Vulnerable		Unlikely – no suitable habitat present
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable		Unlikely – no suitable foraging habitat present
Reptile				
Aprasia parapulchella	Pink-tailed Worm-lizard, Pink-tailed Legless Lizard	Vulnerable		Unlikely – no suitable habitat present
Delma impar	Striped Legless Lizard, Striped Snake-lizard	Vulnerable		Unlikely – no suitable habitat present
Plant				
Acacia bynoeana	Bynoe's Wattle, Tiny Wattle	Vulnerable		Not recorded during survey of subject land
Dodonaea procumbens	Trailing Hop-bush	Vulnerable		Not recorded during survey of subject land
Eucalyptus aggregata	Black Gum	Vulnerable		Not recorded during survey of subject land
Leucochrysum albicans **subsp.** ***tricolor***	Hoary Sunray, Grassland Paper-daisy	Endangered		Unlikely – habitat degraded
Pomaderris cotoneaster	Cotoneaster Pomaderris	Endangered		Not recorded during survey of subject land
Pomaderris pallida	Pale Pomaderris	Vulnerable		Not recorded during survey of subject land
Rhizanthella slateri	Eastern Underground Orchid	Endangered		Unlikely – habitat degraded

Scientific Name	Common Name	Threat status	Migratory Status	Occurrence within subject land
Thesium australe	Austral Toadflax, Toadflax	Vulnerable		Unlikely – habitat degraded

11.1.2 Biosecurity Act 2015

The weed species listed in Table 11-2 have been recorded on the subject land, are regulated under the *Biosecurity Act 2015* and are identified as priority weeds for the South East region (which includes the Goulburn Mulwaree Council area). The species and their biosecurity duty measures are outlined in Table 11-2.

Gunlake Quarry operates according to the approved Gunlake Quarry Environmental Management System (Gunlake Quarries, 2021b) which includes the Biodiversity and Rehabilitation Management Plan (Gunlake Quarries, 2015). The management of the priority weeds within the subject land will continue to be managed in accordance with this plan, which identifies both Serrated Tussock (*Nassella trichotoma*) and Blackberry (*Rubus fruticosus* species aggregate) as priority weeds.

Table 11-2: Priority weed species recorded in the subject land and their biosecurity duty measures

Scientific name	Common name	Biosecurity duty measure
Nassella trichotoma	Serrated Tussock	**Prohibition on certain dealings** Must not be imported into the state, sold, bartered, exchanged or offered for sale.
***Rubus fruticosus* species aggregate**	Blackberry complex	**Prohibition on certain dealings** Must not be imported into the state, sold, bartered, exchanged or offered for sale. All species in the *Rubus fruticosus* species aggregate have this requirement, except for the varietals Black Satin, Chehalem, Chester Thornless, Dirksen Thornless, Loch Ness, Murrindindi, Silvan, Smooth Stem, and Thornfree.

12 Biodiversity credit report

The BAM-C credit report, which identifies the numbers and classes of biodiversity credits required to be retired in accordance with the like-for-like requirements of the offset rules, confirms that there are no credits required to be retired for the proposed development (see Appendix C and Table 12-1).

Table 12-1: Ecosystem credit class and matching credit profile

Ecosystem credit	Attributes shared with matching credits							
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC or EC	Offset trading group	Hollow-bearing trees present?	IBRA subregion where the proposed development is located	Credits
3738	Goulburn-Lithgow Tableland Hills Grassy Fores	Southern Tableland Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrubby sub-formation)	Not a TEC	Southern Tableland Dry Sclerophyll Forests - ≥ 50% - < 70% cleared group (including Tier 3 or higher threat status).	No	Bungonia	0

13 Conclusion

This BDAR has been prepared in accordance with the small area streamlined module of the BAM to assess the potential biodiversity impacts of the expansion of the Western Emplacement at Gunlake Quarry by approximately 3.00 ha.

Impacts have largely been avoided through iterative design of the expanded Western Emplacement, with reductions in footprint and avoidance of higher quality remnants and areas of Box Gum Woodland CEEC.

The residual impact is limited to the loss of 3.00 ha of highly degraded PCT 3738 occurring as a DNG, and associated habitat for ecosystem credit species. PCT 3738 within the subject land has a vegetation integrity score of 9.7 and as such, the proposed development will not require offsetting to compensate for residual impacts on PCT 3738.

There are no residual impacts to habitat for species credit species or SAII entities.

Measures are outlined to further mitigate residual impacts.

The BDAR has also considered impacts on species and ecological communities listed under the EPBC Act. There is unlikely to be any MNES present within the subject land; therefore, the proposed development is unlikely to have a significant impact on MNES.

14 References

DPI. (2012). *NSW Aquifer Interference Policy.* Sydney: Department of Primary Industries Office of Water.

DPI. (2013). *Policy and guidelines for fish habitat conservation and management (2013 update).* Department of Primary Industries.

DPIE. (2020). *Biodiversity Assessment Method.* Sydney: Department of Planning, Industry and Environment.

EMM. (2016). *Gunlake Quarry Extension Project Biodiversity Assessment Report.* Sydney: EMM Consulting Pty Limited.

EMM. (2021). *Gunlake Quarry Continuation Project (SSD-12469087) Biodiversity Development Assessment Report.* Newcastle: EMM Consulting Pty Limited.

Gunlake Quarries. (2015). *Gunlake Quarry Rehabilitation and Biodiversity Offset Management Plan.* Marulan: Gunlake Quarries.

Gunlake Quarries. (2021a). *Gunlake Quarry Soil and Water Management Plan.* Marulan: Gunlake Quarries.

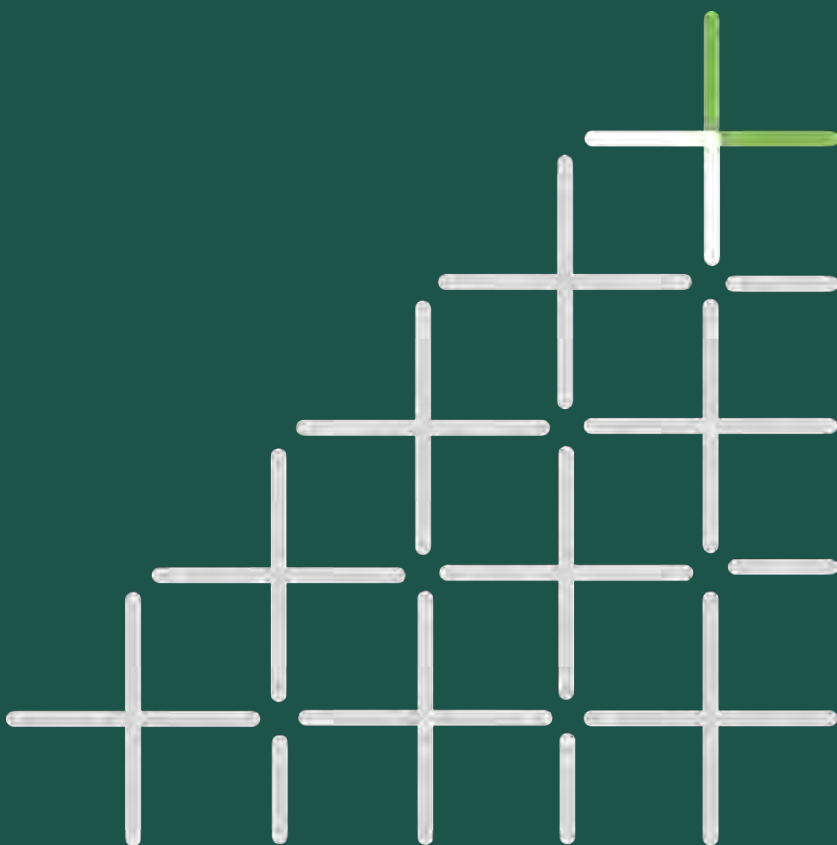
Gunlake Quarries. (2021b). *Gunlake Quarry Environmental Management Strategy.* Marulan: Gunlake Quarries.

LLS. (2022). *South East Regional Strategic Weed Management Plan 2023-2027.* Sydney: South East Local Land Services.

OEH. (2025). *Mixophyes balbus (Stuttering Frog) - profile.* Sydney: NSW Office of Environment and Heritage.

Appendix A

BDAR requirements compliance



Appendix A. BDAR requirements compliance

Table A.1 Assessment of compliance with BDAR minimum information requirements

BDAR Section	BAM Ref..	BAM Requirement	Page Reference(s) in the BDAR
Introduction	**Chapters 2 & 3**	**Information**	
		Introduction to the biodiversity assessment including:	
		☒ brief description of the proposal	Section 1.1.1
		☒ identification of subject land boundary, including: ☒ operational footprint ☒ construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure	Section 1.1.3 & Figure 1-2
		☒ general description of the subject land	Section 1.1.3
		☒ sources of information used in the assessment, including reports and spatial data	Section 1.4
		☒ identification and justification for entering the BOS	Section 1.2
		Maps and tables	
		☒ Map of the subject land boundary showing the final proposal footprint, including the construction footprint for any clearing associated with temporary/ancillary construction facilities and infrastructure	Figure 1-2
Landscape	**Sections 3.1 & 3.2, Appendix E**	**Information**	
		Identification of site context components and landscape features, including:	
		☒ general description of subject land topographic and hydrological setting, geology and soils	Section 3.2
		☒ per cent native vegetation cover in the assessment area (as described in BAM Section 3.2)	Section 3.3
		☒ IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.))	Section 3.2

BDAR Section	BAM Ref..	BAM Requirement	Page Reference(s) in the BDAR
		☒ rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3.) and Appendix E)	Section 3.2
		☒ wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(3.))	Section 3.2
		☒ connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.))	Section 3.2
		☒ karst, caves, crevices, cliffs, rocks and other geological features of significance and for vegetation clearing proposals, soil hazard features (as described in BAM Subsections 3.1.3(7.) and 3.1.3(12.))	Section 3.2
		☒ areas of outstanding biodiversity value occurring on the subject land and assessment area (as described in BAM Subsection 3.1.3(8–9.))	Section 3.2
		☐ any additional landscape features identified in any Secretary's Environmental Assessment Requirements (SEARs) for the proposal	n/a
		☒ NSW (Mitchell) landscape on which the subject land occurs	Section 3.2
		☐ details of field reconnaissance undertaken to confirm the extent and condition of landscape features and native vegetation cover (as described in Operational Manual Stage 1 Section 2.4)	n/a
		Maps and tables	
		☒ Site Map ☒ Property boundary ☒ Boundary of subject land ☒ Cadastre of subject land (including labelling of Lot and DP or section plan if relevant) ☒ Landscape features identified in BAM Subsection 3.1.3	Figure 3-2

BDAR Section	BAM Ref..	BAM Requirement	Page Reference(s) in the BDAR
		☒ Location Map ☒ Digital aerial photography at 1:1,000 scale or finer ☒ Boundary of subject land ☒ Assessment area (i.e. the subject land and either 1500 m buffer area or 500 m buffer for linear development) ☒ Landscape features identified in BAM Subsection 3.1.3 ☒ Additional detail (e.g. local government area boundaries) relevant at this scale	Figure 3-1
		Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location Map include:	-
		☒ IBRA bioregions and subregions ☒ rivers, streams and estuaries ☒ wetlands and important wetlands ☒ connectivity of different areas of habitat ☐ karst, caves, crevices, cliffs, rocks and other geological features of significance and if required, soil hazard features ☐ areas of outstanding biodiversity value occurring on the subject land and assessment area ☐ any additional landscape features identified in any SEARs for the proposal ☒ NSW (Mitchell) landscape on which the subject land occurs	Figure 3-1 & Figure 3-2
		Data	
		☒ All report maps as separate jpeg files	-
		Individual digital shape files of:	-
		☒ subject land boundary	-
		☒ assessment area (i.e. subject land and 1500 m buffer area) boundary	-
		☐ cadastral boundary of subject land	-

BDAR Section	BAM Ref..	BAM Requirement	Page Reference(s) in the BDAR
		☒ areas of native vegetation cover	-
		☐ landscape features	-
Native vegetation	**Chapter 4, Appendix A & Appendix H**	**Information**	
		☒ Identify native vegetation extent within the subject land, including cleared areas and evidence to support differences between mapped vegetation extent and aerial imagery (as described in BAM Section 4.1(1–3.) and Subsection 4.1.1)	Section 4 & Figure 4-1
		☐ Provide justification for all parts of the subject land that do not contain native vegetation (as described in BAM Subsection 4.1.2)	n/a
		☐ Review of existing information on native vegetation including references to previous vegetation maps of the subject land and assessment area (described in BAM Section 4.1(3.) and Subsection 4.1.1)	n/a
		☒ Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2	Section 4.1.2
		☐ Where relevant, describe the use of more appropriate local data, provide reasons that support the use of more appropriate local data and include the written confirmation from the decision-maker that they support the use of more appropriate local data (as described in BAM Subsection 1.4.2 and Appendix A)	n/a
		For each PCT within the subject land, describe:	-
		☒ PCT name and ID	Section 4.2.2 & Figure 4-1
		☒ vegetation class	Section 4.2.2
		☒ extent (ha) within subject land	Section 4.2.2
		☒ evidence used to identify a PCT including any analyses undertaken, references/sources, existing vegetation maps (BAM Section 4.2(1–3.))	Section 4.2.2.3

BDAR Section	BAM Ref..	BAM Requirement	Page Reference(s) in the BDAR
		☒ plant species relied upon for identification of the PCT and relative abundance of each species	Section 4.2.2.3
		☒ if relevant, TEC status including evidence used to determine vegetation is the TEC (BAM Subsection 4.2.2(1–2.))	Section 4.2.2.4
		☒ estimate of per cent cleared value of PCT (BAM Subsection 4.2.1(5.))	Section 4.2.2
		Describe the vegetation integrity assessment of the subject land, including:	-
		☒ identification and mapping of vegetation zones (as described in BAM Subsection 4.3.1)	Section 4.2.2.2 and Figure 4-1
		☒ description of vegetation zones within the subject land (as described in Operational Manual Stage 1 Table 2 and Subsection 3.3.2)	Section 4.2.2.2
		☒ area (ha) of each vegetation zone	Section 4.2.2
		☒ assessment of patch size (as described in BAM Subsection 4.3.2)	Section 4.2.2
		☒ survey effort (i.e. number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4(1–2.)	Section 4.1.2.2
		☒ use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsection 4.3.3(5.))	Section 4.1.2.2
		Where use of more appropriate local benchmark data is proposed (as described in BAM Subsection 1.4.2, BAM Subsection 4.3.3(5.) and BAM Appendix A):	-
		☐ identify the PCT or vegetation class for which local benchmark data will be applied ☐ identify published sources of local benchmark data (if benchmarks obtained from published sources) ☐ describe methods of local benchmark data collection (if reference plots used to determine local benchmark data)	n/a
		☐ provide justification for use of local data rather than BioNet Vegetation Classification benchmark values	n/a
		☐ provide written confirmation from the decision-maker that they support the use of local benchmark data	n/a

BDAR Section	BAM Ref..	BAM Requirement	Page Reference(s) in the BDAR
		Maps and tables	
		☒ Map of native vegetation extent within the subject land at scale not greater than 1:10,000 including identification of all areas of native vegetation including areas that are ground cover only, cleared areas (as described in BAM Section 4.1(1–3.)) and all parts of the subject land that do not contain native vegetation (BAM Subsection 4.1.2)	Figure 4-1
		☒ Map of PCTs within the subject land (as described in BAM Section 4.2(1.))	Figure 4-1
		☒ Map of vegetation zones within the subject land (as described in BAM Subsection 4.3.1)	Figure 4-1
		☒ Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCT boundaries	Figure 4-1
		☐ Map of TEC distribution on the subject land and table of TEC listing, status and area (ha)	n/a
		☒ Map of patch size locations for each native vegetation zone and table of patch size areas (as described in BAM Subsection 4.3.2)	Table 4-2
		Table of current vegetation integrity scores for each vegetation zone within the site and including:	-
		☒ composition condition score ☒ structure condition score ☒ function condition score ☒ presence of hollow bearing trees	Table 4-3
		Data	
		☒ All report maps as separate jpeg files	-
		☒ Plot field data (MS Excel format)	Appendix B
		☒ Plot field datasheets	Appendix B
		Digital shape files of:	-

BDAR Section	BAM Ref..	BAM Requirement	Page Reference(s) in the BDAR
		☒ PCT boundaries within subject land	-
		☐ TEC boundaries within subject land	-
		☒ vegetation zone boundaries within subject land	-
		☒ floristic vegetation survey and vegetation integrity plot locations	-
Threatened species	**Chapter 5**	**Information**	
		Identify ecosystem credit species likely to occur on the subject land, including:	-
		☒ list of ecosystem credit species derived from the BAM-C (as described in BAM Subsection 5.1.1 and Section 5.2(1.))	Table 5-1
		☒ justification and supporting evidence for exclusion of any ecosystem credit species based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	Table 5-1
		☐ justification for addition of any ecosystem credit species to the list	n/a
		Identify species credit species likely to occur on the subject land, including:	-
		☒ list of species credit species derived from the BAM-C (as described in BAM Subsection 5.1.1)	Table 5-2
		☒ justification and supporting evidence for exclusions based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	Section 5.1.2 & Table 5-2
		☒ justification and supporting evidence for exclusions based on degraded habitat constraints and/or microhabitats on which the species depends (as described in BAM Subsection 5.2.2)	Section 5.1.2 & Table 5-2
		☐ justification for addition of any species credit species to the list	n/a
		From the list of candidate species credit species, identify:	-

BDAR Section	BAM Ref..	BAM Requirement	Page Reference(s) in the BDAR
		☐ species assumed present within the subject land (if relevant) (as described in BAM Subsection 5.2.4(2.a.)) ☐ species present within the subject land on the basis of being identified on an important habitat map for a species (as described in BAM Subsection 5.2.4(2.d.)) ☐ species for which targeted surveys are to be completed to determine species presence (BAM Subsection 5.2.4(2.b.)) ☐ species for which an expert report is to be used to determine species presence (BAM Subsection 5.2.4(2.c.))	n/a
		Present the outcomes of species credit species assessments from:	-
		☐ threatened species survey (as described in BAM Section 5.2.4)	n/a
		☐ expert reports (if relevant) including justification for presence of the species and information used to make this determination (as described in BAM Subsection 5.2.4, Section 5.3, Box 3)	n/a
		Where survey has been undertaken include detailed information on:	-
		☐ survey method and effort (as described in BAM Section 5.3)	n/a
		☐ justification of survey method and effort (e.g. citation of peer-reviewed literature) if approach differs from the department's taxa-specific survey guides or where no relevant guideline has been published	n/a
		☐ timing of survey in relation to requirements in the TBDC or the department's taxa-specific survey guides. Where survey was undertaken outside these guides include justification for the timing of surveys	n/a
		☐ survey personnel and relevant experience	n/a
		☐ describe any limitations to surveys and how these were addressed/overcome	n/a
		Where an expert report has been used in place of survey (as described in BAM Section 5.3, Box 3), include:	-
		☐ justification of the use of an expert report ☐ identify the expert, provide evidence of their expert credentials and departmental approval of expert status ☐ all requirements of Box 3 have been addressed in the expert report	n/a

BDAR Section	BAM Ref..	BAM Requirement	Page Reference(s) in the BDAR
		Where use of local data is proposed (BAM Subsection 1.4.2):	-
		☐ identify relevant species ☐ identify data to be amended ☐ identify source of information for local data, e.g. published literature, additional survey data, etc. ☐ justify use of local data in preference to VIS Classification or TBDC data	n/a
		☐ provide written confirmation from the decision-maker that they support the use of local data	n/a
		Species polygon completed for species credit species present within the subject land (assumed present or determined on the basis of survey, expert report or important habitat map) ensuring that:	-
		☐ the unit of measure for each species is documented	n/a
		for species assessed by area:	-
		☐ the polygon includes the extent of suitable habitat for the target species within the subject land (as described in BAM Subsection 5.2.5)	n/a
		☐ a description of, and evidence-based justification for, the habitat constraints, features or microhabitats used to map the species polygon including reference to information in the TBDC for that species and any buffers applied	n/a
		for species assessed by counts of individuals:	-
		☐ the number of individual plants present on the subject land (as described in BAM Subsection 5.2.5(3.))	n/a
		☐ the method used to derive this number (i.e. threatened species survey or expert report) and evidence-based justification for the approach taken	n/a
		☐ the polygon includes all individuals located on the subject land with a buffer of 30 m around the individuals or groups of individuals on the subject land	n/a
		☐ Identify the biodiversity risk weighting for each species credit species identified as present within the subject land (as described in BAM Section 5.4)	n/a

BDAR Section	BAM Ref..	BAM Requirement	Page Reference(s) in the BDAR
		Maps and tables	
		☒ Table showing ecosystem credit species in accordance with BAM Subsection 5.1.1, and identifying:	Table 5-1
		☒ the ecosystem credit species removed from the list	Table 5-1
		☒ the sensitivity to gain class of each species	Table 5-1
		☒ Table detailing species credit species in accordance with BAM Section 5.2 and identifying:	Table 5-1
		☒ the species credit species removed from the list of species because the species is considered vagrant, out of geographic range or the habitat or microhabitat features are not present	Table 5-1
		☒ the candidate species credit species not recorded on the subject land as determined by targeted survey, expert report or important habitat map	Table 5-1
		☐ Table detailing species credit species recorded or assumed as present within the subject land, habitat constraints or microhabitats associated with the species, counts of individuals (flora)/extent of suitable habitat (flora and fauna) (as described in BAM Subsection 5.2.6) and biodiversity risk weighting (BAM Section 5.4)	n/a
		☐ Map indicating the GPS coordinates of all individuals of each species recorded within the subject land and the species polygon for each species (as described in BAM Subsection 5.2.5	n/a
		Data	
		☐ Digital shape files of suitable habitat identified for survey for each candidate species credit species	n/a
		☐ Survey locations including GPS coordinates of any plots, transects, grids	n/a
		☐ Digital shape files of each species polygon including GPS coordinates of located individuals	n/a
		☐ Species polygon map in jpeg format	n/a
		☐ Expert reports and any supporting data used to support conclusions of the expert report	n/a

BDAR Section	BAM Ref..	BAM Requirement	Page Reference(s) in the BDAR
		☐ Field datasheets detailing survey information including prevailing conditions, date, time, equipment used, etc.	n/a
Prescribed impacts	**Chapter 6**	**Information**	
		Identify potential prescribed biodiversity impacts on threatened entities, including:	-
		☒ karst, caves, crevices, cliffs, rocks and other geological features of significance (as described in BAM Subsection 6.1.1) ☒ occurrences of human-made structures and non-native vegetation (as described in BAM Subsection 6.1.2) ☒ corridors or other areas of connectivity linking habitat for threatened entities (as described in BAM Subsection 6.1.3) ☒ waterbodies or any hydrological processes that sustain threatened entities (as described in BAM Subsection 6.1.4)	Section 6 & Table 6-1
		☐ protected animals that may use the proposed wind farm development site as a flyway or migration route (as described in BAM Subsection 6.1.5)	n/a
		☐ where the proposed development may result in vehicle strike on threatened fauna or on animals that are part of a threatened ecological community (as described in BAM Subsection 6.1.6	n/a
		☐ Identify a list of threatened entities that may be dependent upon or may use habitat features associated with any of the prescribed impacts	n/a
		☐ Describe the importance of habitat features to the species including, where relevant, impacts on life cycle or movement patterns (e.g. Subsection 6.1.3)	n/a
		Where the proposed development is for a wind farm:	-
		☐ identify a candidate list of protected animals that may use the development site as a flyway or migration route, including: resident threatened aerial species, resident raptor species and nomadic and migratory species that are likely to fly over the proposal area (as described in BAM Subsection 6.1.5)	n/a

BDAR Section	BAM Ref..	BAM Requirement	Page Reference(s) in the BDAR
		☐ provide details of targeted survey for candidate species of wind farm developments undertaken in accordance with BAM Subsection 6.1.5(2–3.)	n/a
		☐ predict the habitual flight paths for nomadic and migratory species likely to fly over the subject land and map the likely habitat for resident threatened aerial and raptor species (BAM Subsection 6.1.5(4.))	n/a
		Where the proposal may result in vehicle strike	-
		☐ identify a list of threatened fauna or protected fauna species that are part of a TEC and at risk of vehicle strike due to the proposal	n/a
		Maps and tables	
		☐ Map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.)	n/a
		☐ Map showing location of potential vehicle strike locations	n/a
		☐ Maps of habitual flight paths for nomadic and migratory species likely to fly over the site and maps of likely habitat for threatened aerial species resident on the site (for wind farm developments only)	n/a
		Data	
		☐ Digital shape files of prescribed impact feature locations	n/a
		☐ Prescribed impact features map in jpeg format	n/a
Avoid & minimise impacts	**Chapter 7**	**Information**	
		Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposal location in accordance with Chapter 7, including an analysis of alternative:	-

BDAR Section	BAM Ref..	BAM Requirement	Page Reference(s) in the BDAR
		☐ modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology	n/a
		☐ routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route	n/a
		☐ alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location	n/a
		☐ alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed site	n/a
		☒ Describe efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design (as described in BAM Sections 7.1 and 7.2)	Section 7.1
		☒ Identification of any other site constraints that the proponent has considered in determining the location and design of the proposal (as described in BAM Subsection 7.2.1(3.))	Section 7.1
		☐ Detail measures or options considered but not implemented because they are not feasible and/or practical (e.g. due to site constraints)	n/a
		Maps and tables	
		☒ Table of measures to be implemented to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility	Table 8-4
		☐ Map of alternative footprints considered to avoid or minimise impacts on biodiversity values; and of the final proposal footprint, including construction and operation	Figure 7-1
		☐ Maps demonstrating indirect impact zones where applicable	n/a
		Data	
		Digital shape files of:	-

BDAR Section	BAM Ref..	BAM Requirement	Page Reference(s) in the BDAR
		☒ alternative and final proposal footprint	-
		☒ direct and indirect impact zones	-
		☒ Maps in jpeg format	-
Assessment of impacts	**Chapter 8, Sections 8.1 & 8.2**	**Information**	
		☒ Determine the impacts on native vegetation and threatened species habitat, including a description of direct impacts of clearing of native vegetation, threatened ecological communities and threatened species habitat (as described in BAM Section 8.1)	Section 8.1, Table 8-1 & Table 8-2
		Assessment of indirect impacts on vegetation and threatened species and their habitat including (as described in BAM Section 8.2):	-
		☒ description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal	Table 8-3
		☒ documenting the consequences to vegetation and threatened species and their habitat including evidence-based justifications	Table 8-1
		☐ reporting any limitations or assumptions, etc. made during the assessment	n/a
		☐ identification of the threatened entities and their habitat likely to be affected	n/a
		Assessment of prescribed biodiversity impacts (as described in BAM Section 8.3) including:	-
		assessment of the nature, extent frequency, duration and timing of impacts on the habitat of threatened species or ecological communities associated with	-
		☐ karst, caves, crevices, cliffs, rocks and other features of geological significance	n/a
		☐ human-made structures	n/a

BDAR Section	BAM Ref..	BAM Requirement	Page Reference(s) in the BDAR
		☐ non-native vegetation	n/a
		☐ connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	n/a
		☐ movement of threatened species that maintains their life cycle	n/a
		☐ water quality, waterbodies and hydrological processes that sustain threatened species and threatened ecological communities	n/a
		☐ assessment of the impacts of wind turbine strikes on protected animals	n/a
		☐ assessment of the impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC	n/a
		☐ evaluate the consequences of prescribed impacts	n/a
		☐ describe impacts that are uncertain	n/a
		☐ document limitations to data, assumptions and predictions	n/a
		Maps and tables	
		☒ Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts	Table 8-2
		Data	
		N/A	-
Mitigation & Management of impacts	**Chapter 8, Sections 8.4 & 8.5**	**Information**	
		Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Sections 8.4 and 8.5 including:	-

BDAR Section	BAM Ref..	BAM Requirement	Page Reference(s) in the BDAR
		☒ techniques, timing, frequency and responsibility ☒ identify measures for which there is risk of failure ☒ evaluate the risk and consequence of any residual impacts	Section 8.4 & Table 8-4
		☐ document any adaptive management strategy proposed	n/a
		Identification of measures for mitigating impacts related to:	-
		☐ displacement of resident fauna (as described in BAM Subsection 8.4.1(2.)) ☐ indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1(3.)) ☐ mitigating prescribed biodiversity impacts (as described in BAM Subsection 8.4.2)	n/a
		☐ Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5)	n/a
		Maps and tables	
		☒ Table of measures to be implemented before, during and after construction to mitigate and manage impacts of the proposal, including action, outcome, timing and responsibility	Table 8-4
		Data	
		N/A	-
Impact summary	**Chapter 9**	**Information**	
		Identification and assessment of impacts on TECs and threatened species that are at risk of a serious and irreversible impacts (SAII, in accordance with BAM Section 9.1) including:	-
		☐ addressing all criteria in Subsection 9.1.1 for each TEC listed as at risk of an SAII present on the subject land	n/a
		☐ for each TEC, report the extent of the TEC in NSW	n/a

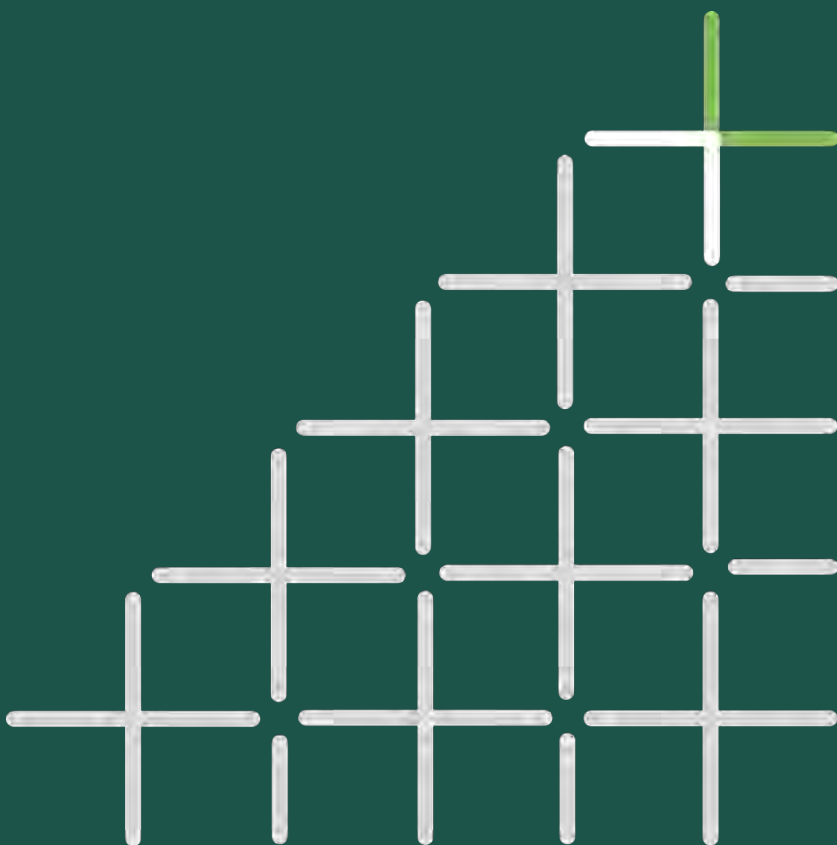
BDAR Section	BAM Ref..	BAM Requirement	Page Reference(s) in the BDAR
		☐ addressing all criteria in Subsection 9.1.2 for each threatened species at risk of an SAII present on the subject land	n/a
		☐ for each threatened species, report the population size in NSW	n/a
		☐ documenting assumptions made and/or limitations to information ☐ documenting all sources of data, information, references used or consulted ☐ clearly justifying why any criteria could not be addressed	n/a
		☒ Identification of impacts requiring offset in accordance with BAM Section 9.2	Section 10.1 & Table 10-1
		☒ Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1(3	Table 10-1
		☐ Identification of areas not requiring assessment in accordance with BAM Section 9.3	n/a
		Maps and tables	
		☐ Map showing the extent of TECs at risk of an SAII within the subject land	n/a
		☐ Map showing location of threatened species at risk of an SAII within the subject land	n/a
		Map showing location of:	-
		☐ impacts requiring offset	n/a
		☐ impacts not requiring offset	n/a
		☐ areas not requiring assessment	n/a
		Data	
		Digital shape files of:	-
		☐ extent of TECs at risk of an SAII within the subject land	n/a

BDAR Section	BAM Ref..	BAM Requirement	Page Reference(s) in the BDAR
		☐ location of threatened species at risk of an SAII within the subject land	n/a
		☐ boundary of impacts requiring offset	n/a
		☒ boundary of impacts not requiring offset	-
		☐ boundary of areas not requiring assessment	n/a
		☐ Maps in jpeg format	-
Impact summary	**Chapter 10**	**Information**	
		Ecosystem credits and species credits that measure the impact of the development on biodiversity values, including:	-
		☒ future vegetation integrity score for each vegetation zone within the subject land (Equation 25 and Equation 26 in BAM Appendix H) ☒ change in vegetation integrity score (BAM Subsection 8.1.1) ☒ number of required ecosystem credits for the direct impacts of the proposal on each vegetation zone within the subject land (BAM Subsection 10.1.2)	Table 10-1
		☐ biodiversity risk weighting for each	n/a
		☐ number of required species credits for each candidate threatened species that is directly impacted on by the proposal (BAM Subsection 10.1.3)	n/a
		Maps and tables	
		☐ Table of PCTs requiring offset and the number of ecosystem credits required	n/a
		☐ Table of threatened species requiring offset and the number of species credits required	n/a
		Data	

BDAR Section	BAM Ref..	BAM Requirement	Page Reference(s) in the BDAR
		☒ Submitted proposal in the BAM Calculator	-
Biodiversity credit report	**Chapter 10**	**Information**	
		☐ Description of credit classes for ecosystem credits and species credits at the development or clearing site or land to be biodiversity certified (BAM Section 10.2)	n/a
		☒ BAM credit report in pdf format	Appendix C
		Maps and tables	
		☐ Table of credit class and matching credit profile	n/a
		Data	
		☒ BAM credit report in pdf format	Appendix C

Appendix B

Vegetation survey data



Appendix B. Vegetation survey data

Table B.1 Vegetation survey data and locations

plot	pct	area	patchsize	condition clases	zone	easting	northing	bearing	compTree	compShrub	compGrass	compForbs	compFerns	compOther	strucTree	strucShrub	strucGrass	strucForbs	strucFerns	strucOther	funLargeTrees	funHollowTrees	funLitterCover	funLenFallenLogs	funTreeStem5to9	funTreeStem10to19	funTreeStem20to29	funTreeStem30to49	funTreeStem50to79	funTreeRegen	FunHighThreatExotic	Plot-based vegetation survey?	Vegetation integrity survey?
731D003	3738	3.00	101	DNG	55	771301	6159436	357	0	2	12	6	0	0	0.0	0.4	29.7	0.7	0.0	0.0	0	0	1.2	0.0	0	0	0	0	0	0	2.2	☒ Yes ☐ No	☒ Yes ☐ No
731D004	3738	3.00	101	DNG	55	771380	6159659	7	0	0	6	5	0	0	0.0	0.0	3.6	0.8	0.0	0.0	0	0	1.8	0.0	0	0	0	0	0	0	21.1	☒ Yes ☐ No	☒ Yes ☐ No
Gunlake PL03	3738	3.00	101	DNG	55	771299	6159500	223	0	2	11	9	0	0	0	4	14.5	2.7	0	0	0	0	10.6	0	0	0	0	0	0	0	15.3	☒ Yes ☐ No	☒ Yes ☐ No

BAM Site – Field Survey Form

Plot ID:	731D003	**Date:**	28/06/23	**Project number:**	E230595	**Plot dimensions:**	20 x 50 m
Datum:	GDA94	**Easting:**	771,301	**Recorders:**	MH, MP		
Zone:	55	**Northing:**	6,159,436	**IBRA region:**		**Midline bearing:**	357
Plant Community Type:	731: Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills, South Eastern Highlands Bioregion			**Condition class:**	DNG	**PCT confidence:**	high
Vegetation Class:	Southern Tableland Grassy Woodlands			**EEC:**	no	**EEC confidence:**	high

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m2 plot)		Sum values
Count of Native Richness	Trees:	0
	Shrubs:	2
	Grasses etc.:	12
	Forbs:	6
	Ferns:	0
	Other:	0
Sum of Cover of native vascular plants by growth form group	Trees:	0
	Shrubs:	0.4
	Grasses etc.:	29.7
	Forbs:	0.7
	Ferns:	0
	Other:	0
High Threat Weed cover:		2.2

BAM Attribute (1000 m2 plot) DBH			
DBH	Tree stem count	Length of logs (m) (≥10 cm diameter, >50 cm in length)	0
80 + cm:	0		
50 – 79 cm:	0		
30 – 49 cm:	0		
20 – 29 cm:	0	Tree hollow count	0
10 – 19 cm:	0		
5 – 9 cm:	0		
< 5 cm:	0		

Counts apply when no. of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For multi-stemmed tree, only largest living stem is included in the count. Tree stems must be living.
For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)				
Subplot:	1	2	3	4	5
Subplot score (%):	1	0	3	1	1
Average litter cover (%):	1.2				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography and site features

Plot Disturbance

Grazing, cleared

GF Code: see Growth Form definitions in Appendix 1; N: native, E: exotic, HTE: high threat exotic; GF – circle code if 'top 3'; Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover)
Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Project name:	E230595				
Recorders:	MH, MP	**Plot ID:**	731D003	**Date:**	28/06/23

GF Code	Scientific name	Cover	Abundance	Voucher	N, E or HTE
Grass & grasslike (GG)	*Eragrostis brownii (Brown's Lovegrass)*	25	2000		N
Shrub (SG)	*Cassinia sifton*	0.1	10		N
Grass & grasslike (GG)	*Juncus filicaulis*	0.2	100		N
	Acetosella vulgaris (Sheep Sorrel)	0.1	100		HTE
Grass & grasslike (GG)	*Carex inversa (Knob Sedge)*	0.1	100		N
	Nassella trichotoma (Serrated Tussock)	2	100		HTE
	Plantago lanceolata (Lamb's Tongues)	0.1	20		E
Grass & grasslike (GG)	*Dichelachne spp. (A Plumegrass)*	0.1	20		N
Shrub (SG)	*Lissanthe strigosa (Peach Heath)*	0.3	50		N
Grass & grasslike (GG)	*Lomandra filiformis subsp. coriacea (Wattle Matt-rush)*	0.2	100		N
	Hypochaeris radicata (Catsear)	0.1	100		E
Forb (FG)	*Gonocarpus tetragynus (Poverty Raspwort)*	0.2	1000		N
Grass & grasslike (GG)	*Microlaena stipoides var. stipoides (Weeping Grass)*	2	400		N
Grass & grasslike (GG)	*Panicum effusum (Hairy Panic)*	0.5	100		N
Grass & grasslike (GG)	*Themeda triandra*	0.5	100		N
Grass & grasslike (GG)	*Bothriochloa macra (Red Grass)*	0.2	100		N
	Rubus fruticosus sp. agg. (Blackberry complex)	0.1	4		HTE
	Conyza bonariensis (Flaxleaf Fleabane)	0.1	50		E
Grass & grasslike (GG)	*Austrostipa spp. (A Speargrass)*	0.2	50		N
	Poaceae indeterminate (Grasses, reeds and bamboos)	0.1	10		E
	Paronychia brasiliana (Chilean Whitlow Wort, Brazilian Whitlow)	0.1	10		E
Grass & grasslike (GG)	*Cynodon dactylon (Common Couch)*	0.5	100		N
	Cirsium vulgare (Spear Thistle)	0.1	100		E
Grass & grasslike (GG)	*Sporobolus creber (Slender Rat's Tail Grass)*	0.2	50		N
	Trifolium spp. (A Clover)	0.1	100		E
	Holcus lanatus (Yorkshire Fog)	0.5	60		E
	Soliva sessilis (Bindyi)	0.1	40		E
Forb (FG)	*Haloragis heterophylla (Variable Raspwort)*	0.1	100		N
Forb (FG)	*Acaena spp. (Sheep's Burr)*	0.1	10		N
Forb (FG)	*Euchiton involucratus (Star Cudweed)*	0.1	100		N
Forb (FG)	*Veronica plebeia (Trailing Speedwell)*	0.1	20		N
Forb (FG)	*Cymbonotus spp.*	0.1	10		N
	Poaceae indeterminate (Grasses, reeds and bamboos)	1	10000		E

BAM Site – Field Survey Form

Plot ID:	731D004	**Date:**	28/06/23	**Project number:**	E230595	**Plot dimensions:**	20 x 50 m
Datum:	GDA94	**Easting:**	771,380	**Recorders:**	MH, MP		
Zone:	55	**Northing:**	6,159,659	**IBRA region:**		**Midline bearing:**	7
Plant Community Type:	731: Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills, South Eastern Highlands Bioregion			**Condition class:**	DNG	**PCT confidence:**	high
Vegetation Class:	Southern Tableland Grassy Woodlands			**EEC:**	no	**EEC confidence:**	high

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m2 plot)		Sum values
Count of Native Richness	Trees:	0
	Shrubs:	0
	Grasses etc.:	6
	Forbs:	5
	Ferns:	0
	Other:	0
Sum of Cover of native vascular plants by growth form group	Trees:	0
	Shrubs:	0
	Grasses etc.:	3.6
	Forbs:	0.8
	Ferns:	0
	Other:	0
High Threat Weed cover:		21.1

BAM Attribute (1000 m2 plot) DBH			
DBH	**Tree stem count**		
80 + cm:	0	**Length of logs (m) (≥10 cm diameter, >50 cm in length)**	0
50 – 79 cm:	0		
30 – 49 cm:	0		
20 – 29 cm:	0	**Tree hollow count**	0
10 – 19 cm:	0		
5 – 9 cm:	0		
< 5 cm:	0		

Counts apply when no. of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For multi-stemmed tree, only largest living stem is included in the count. Tree stems must be living.
For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)				
Subplot:	**1**	**2**	**3**	**4**	**5**
Subplot score (%):	2	1	0	3	3
Average litter cover (%):	1.8				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography and site features

Hill, on slight southern slope

Plot Disturbance

Serrated tussock prevalent, grazing

GF Code: see Growth Form definitions in Appendix 1; N: native, E: exotic, HTE: high threat exotic; GF – circle code if 'top 3'; Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover)
Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Project name:	E230595				
Recorders:	MH, MP	**Plot ID:**	731D004	**Date:**	28/06/23

GF Code	Scientific name	Cover	Abundance	Voucher	N, E or HTE
	Nassella trichotoma (Serrated Tussock)	20	200		HTE
	Alyssum spp.	0.1	5		E
	Rubus fruticosus sp. agg. (Blackberry complex)	0.1	4		HTE
	Cyperus eragrostis (Umbrella Sedge)	0.5	100		HTE
	Marrubium vulgare (White Horehound)	0.2	20		E
Forb (FG)	*Malva spp. (Mallow)*	0.2	100		E
Forb (FG)	*Solanum spp.*	0.1	10		E
	Poaceae indeterminate (Grasses, reeds and bamboos)	25	10000		E
	Plantago lanceolata (Lamb's Tongues)	0.1	100		E
	Acetosella vulgaris (Sheep Sorrel)	0.5	1000		HTE
	Cirsium vulgare (Spear Thistle)	0.1	100		E
Forb (FG)	*Geranium spp.*	0.3	500		N
Grass & grasslike (GG)	*Carex inversa (Knob Sedge)*	1	2000		N
Grass & grasslike (GG)	*Juncus filicaulis*	0.5	100		N
	Trifolium spp. (A Clover)	0.1	100		E
Grass & grasslike (GG)	*Bromus spp. (A Brome)*	0.5	200		E
Grass & grasslike (GG)	*Microlaena stipoides var. stipoides (Weeping Grass)*	1	1000		N
Forb (FG)	*Acaena spp. (Sheep's Burr)*	0.1	50		N
Grass & grasslike (GG)	*Digitaria spp. (A Finger Grass)*	0.5	200		E
	Salvia verbenaca (Vervain)	0.1	100		E
	Hypochaeris radicata (Catsear)	0.1	10		E
Grass & grasslike (GG)	*Austrostipa scabra (Speargrass)*	0.1	4		N
Forb (FG)	*Rumex brownii (Swamp Dock)*	0.1	4		N

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BAM Site – Field Survey Form

Site Sheet no: 1 of 2

Survey Name	Zone ID	Recorders
Gunlake		LM

Date	9 12 24	Plot ID	Gunlake Plot 3	Plot dimensions	20×20 in 20×50	Photo #
Zone 56	Datum WGS84					
Easting 221519	Northing 6159263	IBRA region	SE Highlands	Midline bearing from 0 m	223° SW	

Vegetation Class	Southern Tableland Grassy Woodlands	Confidence: H M L
Plant Community Type	3373 - Goulburn Tableland Box-Gum Grassy Forest/ EEC: yes	Confidence: H M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

→ white box - yellow box - blakelys red gum TE

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm		
20 – 29 cm		nil trees.
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	nil	

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	10	15	3	5	20	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element	upper slope	Landform Pattern	low hills	Microrelief	
Lithology	volcanics	Soil Surface Texture	silty clay	Soil Colour	light brown	Soil Depth	
Slope	<5°	Aspect	140° SE.	Site Drainage	good.	Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)	3		cleared grazing lands (historically grazed)
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (Identify native/stock)			
Fire damage			
Storm damage			
Weediness	3		
Other			minor rock outcropping.

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

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400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 9 12 24	Gunlake quarry	Gunlake Plot 3	LM

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
g	1 Vulpia myuros *	E	30	200+	G	1 ✓
f	2 Centaurium erythraea * fl. ⁘	E	0.3	10+	G	
f	3 Hypochaeris radicata *	E	20	300+	G	
g	4 Nassella trichotoma *	HTE	10	50+	G	
g	5 Aira sp. * dried SH.	E	3	100+	G	
r	6 Juncus subsecundus x filicaulis	N	3	30+	G	2 ✓
f	7 Hypericum gramineum fl. ⁘	N	1	30+	G	
g	8 Microlaena stipoides	N	0.5	20+	G	
g	9 Dichelachne micrantha	N	2	50+	G	3 ✓
g	10 Poaceae tuft (Rytidosperma).	N	1	30+	G	
f	11 Chrysocephalum apiculatum	N	0.3	4	G	
f	12 Acetosella vulgaris *	E	5	100+	G	
s	13 Lissanthe strigosa.	N	3	10	G	
g	14 Rytidosperma setaceum	N	5	50+	G	4 ✓
f	15 Einadia nutans	N	0.2	3	G	
g	16 Dactylis glomerata * - dominant	E	30	200+	G	
g	17 Austrostipa scabra falcata	N	0.2	3	G	
f	18 Cirsium sp. * rosette	E	0.5	10+	G	
f	19 Plantago lanceolata *	E	0.3	5	G	
s	20 Cassinia sifton	N	1	2	M	
f	21 Tricoryne elatior fl. ⁘	N	0.5	30+	G	
f	22 Lomandra filiformis filiformis.	N	1	10+	G	
s	23 Rubus fruticosus agg. *	E	0.3	2	G	
f	24 Euchiton sphaericus	N	0.1	2	G	5 ✓
f	25 Taraxacum officinale *	E	0.3	10+	G	
g	26 Eragrostis leptostachya	N	0.5	20+	G	6 ✓
g	27 Briza minor *	E	0.3	10+	G	
f	28 Senecio quadridentatus	N	0.2	2	G	
g	29 Rytidosperma racemosum fl. ⁘	N	1	30+	G	
g	30 Anthosachne scaber.	N	0.2	5	G	
g	31 Themeda triandra	N	0.1	2	G	
f	32 Geranium solanderi fl. ⁘	N	0.1	1	G	
f	33 Euchiton involucratus	N	0.1	1	G	
f	34 Acaena ovina	N	0.2	2	G	
f	35 Wahlenbergia communis	N	0.1	1	G	
	36					
	37					
	38					
	39 Note: low/moderate condition DNG 3373 (mix native/non native pasture)					
	40					

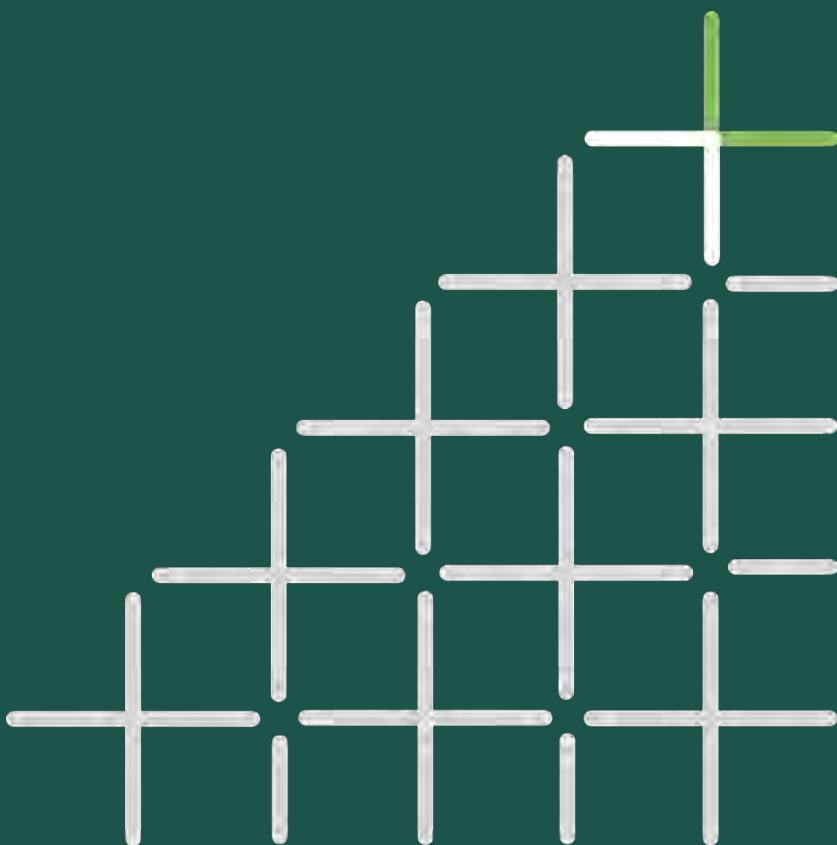
GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Appendix C

Credit reports



Appendix C. Credit reports

The following reports are appended to this BDAR with finalised status:

- Credits summary report,
- Biodiversity credit report (like-for-like),
- Candidate threatened species report,
- Predicted species report.

BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00055101/BAAS17058/25/00059751	Gunlake Quarry MOD 3 - Expansion of the Western Emplacement	05/08/2025
Assessor Name	Report Created	BAM Data version *
	21/11/2025	Current classification (live - default) (82)
Assessor Number	BAM Case Status	Date Finalised
BAAS17058	Finalised	21/11/2025
Assessment Revision	BOS entry trigger	Assessment Type
4	BOS Threshold: Area clearing threshold	Part 4 Developments (Small Area)

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits

Goulburn-Lithgow Tableland Hills Grassy Forest											
1	3738_DNG	Not a TEC	9.7	9.7	3	PCT Cleared - 69%	High Sensitivity to Gain			1.75		0
											Subtotal	**0**
											Total	**0**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00055101/BAAS17058/25/00059751

Proposal Name
Gunlake Quarry MOD 3 - Expansion of the Western Emplacement

BAM data last updated *
05/08/2025

Assessor Name

Assessor Number
BAAS17058

BAM Data version *
Current classification (live - default) (82)

Proponent Names

Report Created
21/11/2025

BAM Case Status
Finalised

Assessment Revision
4

BOS entry trigger
BOS Threshold: Area clearing threshold

Assessment Type
Part 4 Developments (Small Area)

Date Finalised
21/11/2025

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Nil

BAM Biodiversity Credit Report (Like for like)

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Calyptorhynchus lathami lathami / South-eastern Glossy Black-Cockatoo
Grantiella picta / Painted Honeyeater
Pycnoptilus floccosus / Pilotbird

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3738-Goulburn-Lithgow Tableland Hills Grassy Forest	Not a TEC	3.0	0	0	0

BAM Biodiversity Credit Report (Like for like)

3738-Goulburn-Lithgow Tableland Hills Grassy Forest

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Southern Tableland Dry Sclerophyll Forests This includes PCT's: 299, 344, 349, 351, 352, 653, 701, 727, 730, 957, 1093, 1177, 3730, 3732, 3734, 3735, 3737, 3738, 3741, 3743, 3744, 3746, 3747	Southern Tableland Dry Sclerophyll Forests >=50% and <70%	3738_DNG	No	0	Bungonia, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

No Species Credit Data

Credit Retirement Options

Like-for-like credit retirement options

BAM Candidate Species Report

Proposal Details

Assessment Id 00055101/BAAS17058/25/00059751	Proposal Name Gunlake Quarry MOD 3 - Expansion of the Western Emplacement	BAM data last updated * 05/08/2025
Assessor Name	Report Created 21/11/2025	BAM Data version * Current classification (live - default) (82)
Assessor Number BAAS17058	Assessment Type Part 4 Developments (Small Area)	BAM Case Status Finalised
Assessment Revision 4	BOS entry trigger BOS Threshold: Area clearing threshold	Date Finalised 21/11/2025

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

List of Species Requiring Survey

Name	Presence	Survey Months

Threatened species Manually Added

None added

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Brush-tailed Rock-wallaby	Petrogale penicillata	Habitat constraints
Large-eared Pied Bat	Chalinolobus dwyeri	Habitat constraints
Stuttering Frog	Mixophyes balbus	Habitat degraded
Swift Parrot	Lathamus discolor	Habitat constraints

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00055101/BAAS17058/25/00059751	Gunlake Quarry MOD 3 - Expansion of the Western Emplacement	05/08/2025
Assessor Name	**Report Created**	**BAM Data version ***
	21/11/2025	Current classification (live - default) (82)
Assessor Number	**Assessment Type**	**BAM Case Status**
BAAS17058	Part 4 Developments (Small Area)	Finalised
Assessment Revision	**BOS entry trigger**	**Date Finalised**
4	BOS Threshold: Area clearing threshold	21/11/2025

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Black Falcon	Falco subniger	3738-Goulburn-Lithgow Tableland Hills Grassy Forest
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	3738-Goulburn-Lithgow Tableland Hills Grassy Forest
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	3738-Goulburn-Lithgow Tableland Hills Grassy Forest
Diamond Firetail	Stagonopleura guttata	3738-Goulburn-Lithgow Tableland Hills Grassy Forest
Dusky Woodswallow	Artamus cyanopterus cyanopterus	3738-Goulburn-Lithgow Tableland Hills Grassy Forest
Flame Robin	Petroica phoenicea	3738-Goulburn-Lithgow Tableland Hills Grassy Forest
Gang-gang Cockatoo	Callocephalon fimbriatum	3738-Goulburn-Lithgow Tableland Hills Grassy Forest
Grey-headed Flying-fox	Pteropus poliocephalus	3738-Goulburn-Lithgow Tableland Hills Grassy Forest

Little Eagle	Hieraaetus morphnoides	3738-Goulburn-Lithgow Tableland Hills Grassy Forest
Little Lorikeet	Glossopsitta pusilla	3738-Goulburn-Lithgow Tableland Hills Grassy Forest
Olive Whistler	Pachycephala olivacea	3738-Goulburn-Lithgow Tableland Hills Grassy Forest
Rosenberg's Goanna	Varanus rosenbergi	3738-Goulburn-Lithgow Tableland Hills Grassy Forest
Scarlet Robin	Petroica boodang	3738-Goulburn-Lithgow Tableland Hills Grassy Forest
South-eastern Hooded Robin	Melanodryas cucullata cucullata	3738-Goulburn-Lithgow Tableland Hills Grassy Forest
Speckled Warbler	Chthonicola sagittata	3738-Goulburn-Lithgow Tableland Hills Grassy Forest
Spotted-tailed Quoll	Dasyurus maculatus	3738-Goulburn-Lithgow Tableland Hills Grassy Forest
Swift Parrot	Lathamus discolor	3738-Goulburn-Lithgow Tableland Hills Grassy Forest
Varied Sittella	Daphoenositta chrysoptera	3738-Goulburn-Lithgow Tableland Hills Grassy Forest
White-bellied Sea-Eagle	Haliaeetus leucogaster	3738-Goulburn-Lithgow Tableland Hills Grassy Forest
White-throated Needletail	Hirundapus caudacutus	3738-Goulburn-Lithgow Tableland Hills Grassy Forest

Threatened species Manually Added

None added

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Common Name	Scientific Name	Plant Community Type(s)
Painted Honeyeater	Grantiella picta	3738-Goulburn-Lithgow Tableland Hills Grassy Forest
Pilotbird	Pycnoptilus floccosus	3738-Goulburn-Lithgow Tableland Hills Grassy Forest
South-eastern Glossy Black-Cockatoo	Calyptorhynchus lathami lathami	3738-Goulburn-Lithgow Tableland Hills Grassy Forest

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

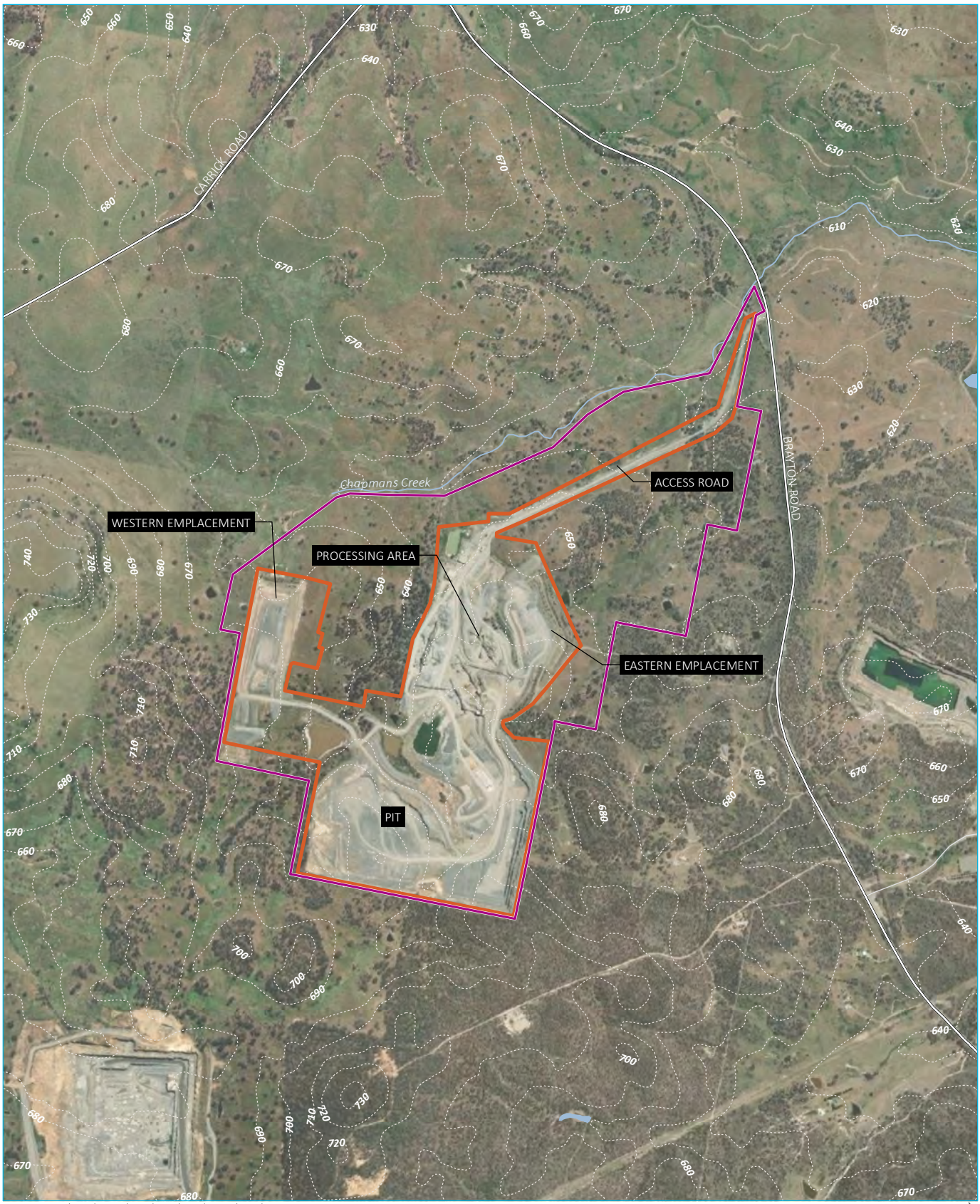
Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C
Painted Honeyeater	Grantiella picta	Habitat constraints
Pilotbird	Pycnoptilus floccosus	Refer to BAR
South-eastern Glossy Black-Cockatoo	Calyptorhynchus lathami lathami	Habitat constraints

Appendix C

Development Layout Plan – Revised continuation project disturbance area

EMM
creating opportunities



Source: EMM (2025); DFSI (2017); GA (2011); ESRI (2025)

0 250 500 m

GDA 1994 MGA Zone 55

N

\\emm.local\xdrive\2023\E230595 - Gunlake Quarry - Continuation Project Modifications\GIS\02_Maps\MOD3\G001_GunlakeQuarryMOD3_20251111_01.mxd 11/11/2025

KEY

- Site boundary
- Continuation project disturbance area

Existing environment

- Major road
- Minor road
- Topographic contour (10 m interval)
- Named watercourse
- Waterbody

Development layout plan

Gunlake Quarry Continuation Project
Modification 3

EMM
creating opportunities

Australia

SYDNEY
Level 10 201 Pacific Highway
St Leonards NSW 2065
T 02 9493 9500

NEWCASTLE
Level 3 175 Scott Street
Newcastle NSW 2300
T 02 4907 4800

BRISBANE
Level 1 87 Wickham Terrace
Spring Hill QLD 4000
T 07 3648 1200

CANBERRA
Suite 2.04 Level 2
15 London Circuit
Canberra City ACT 2601

ADELAIDE
Level 4 74 Pirie Street
Adelaide SA 5000
T 08 8232 2253

MELBOURNE
Suite 9.01 Level 9
454 Collins Street
Melbourne VIC 3000
T 03 9993 1900

PERTH
Suite 3.03
111 St Georges Terrace
Perth WA 6000
T 08 6430 4800

Canada

TORONTO
2345 Yonge Street Suite 300
Toronto ON M4P 2E5
T 647 467 1605

VANCOUVER
2015 Main Street
Vancouver BC V5T 3C2
T 604 999 8297

CALGARY
700 2nd Street SW Floor 19
Calgary AB T2P 2W2

linkedin.com/company/emm-consulting-pty-limited

emmconsulting.com.au