

Aboriginal Heritage Management Plan

Menangle Sand and Soil Quarry

Prepared for Menangle Sand and Soil Pty Ltd
February 2022





Servicing projects throughout Australia and internationally

SYDNEY

Ground Floor, 20 Chandos Street
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

ADELAIDE

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

MELBOURNE

Ground Floor, 188 Normanby Road
Southbank VIC 3006
T 03 9993 1905

PERTH

Suite 9.02, Level 9, 109 St Georges Terrace
Perth WA 6000
T 02 9339 3184

CANBERRA

PO Box 9148
Deakin ACT 2600

Menangle Sand and Soil Quarry - Stage 8 Area

Aboriginal Heritage Management Plan

Report Number

J190166 RP#25

Client

Menangle Sand and Soil Pty Ltd

Date

25 February 2022

Version history

Version	Date	Prepared by	Approved by	Comments
v2a	7 December 2020	R. Desic	P. Towler	Draft
v2b	20 January 2021	R. Desic	P. Towler	Updated based on RAP/Heritage NSW comments
v2	20 April 2021	R. Desic	P. Towler	Updated based DPE comments
v3	28 February 2022	K. Ward	R. Desic	Updated to incorporate MOD2

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

© Reproduction of this report for educational or other non-commercial purposes is authorised without prior written permission from EMM provided the source is fully acknowledged. Reproduction of this report for resale or other commercial purposes is prohibited without EMM's prior written permission.

Table of Contents

1	Introduction	1
1.1	Context	1
1.3	Operations	2
1.4	Purpose and objectives	3
1.5	Authorship	4
1.6	Regulatory consultation	4
2	Environmental requirements	9
2.1	Legislative context	9
2.2	Project consent conditions	10
3	Aboriginal consultation protocols	12
3.1	Registered Aboriginal parties	12
3.2	Consultation process for the EA	12
3.3	Consultation in developing this plan	13
3.4	Ongoing consultation	14
4	Existing environment	16
4.1	Overview	16
4.2	Aboriginal socio-cultural and historical values	16
4.3	Summary of project ACHA and Aboriginal sites	16
4.4	Limitations of project ACHA	18
5	Aboriginal heritage management	21
5.1	Management of known sites	21
5.2	Additional survey and management	22
5.3	Avoidance of buried sandstone features	23
5.4	New finds procedures	24
5.5	Management of salvaged objects	30
5.6	Monitoring and inspection	31
6	Compliance management	32
6.1	Training	32
6.2	Auditing	33
6.3	Reporting	34

References	37
Abbreviations	38

Appendices

Appendix A	Aboriginal site inventory	A.1
Appendix B	Aboriginal consultation	B.1
Appendix C	Regulatory consultation	C.1
Appendix D	Plan approval	D.1

Tables

Table 1.1	Operating hours	3
Table 2.1	Commonwealth and State legislation relevant to the project.	9
Table 2.2	Conditions of Consent relevant to this AHMP	10
Table 3.1	List of RAPs	12
Table 3.2	Summary of consultation for the project EA	13
Table 3.3	Outcomes of consultation with RAPs (RAP submissions attached in Appendix B)	13
Table 4.1	Known Aboriginal sites	18
Table 5.1	Proposed management of newly identified sites within the project area	27
Table 5.2	Procedure for the discovery of potential Aboriginal ancestral remains	29
Table 5.3	Monitoring program for Aboriginal heritage	31
Table 6.1	Roles and responsibilities for Aboriginal heritage management	33
Table 6.2	Abbreviations	38
Table A.1	Site inventory	A.2

Figures

Figure 1.1	Regional context	6
Figure 1.2	Menangle Quarry Stages 1 to 8	7
Figure 1.3	Stage 8 area	8
Figure 4.1	Existing environment	20

1 Introduction

1.1 Context

Menangle Sand and Soil Pty Ltd (Menangle Sand and Soil) operates the Menangle Sand and Soil Quarry at 15 Menangle Road, Menangle (Figure 1.1). Quarrying has been undertaken in the location for over 40 years by a number of operators and at varying rates of production. Extraction, processing and rehabilitation activities have been undertaken by Menangle Sand and Soil since 1978.

The quarry, located in the Wollondilly and Campbelltown local government areas, extracts sand and soil along the Nepean River as approved by Development Consent 85/2865, granted by the Minister for Planning on 15 November 1989.

To date, sand and soil has been extracted from Stages 1 to 2 and 4 to 7 (Figure 1.2). While previously approved, sand and soil will not be extracted from Stage 3.

On 10 September 2020, the NSW Land and Environment Court (LEC) approved the Menangle Quarry Extension – Modification 1 (MOD1) to Development Consent 85/2865. Consent Conditions are provided in the Notice of Orders for LEC 2018/342158.

On 5 November 2021, the Minister for Planning and Public Spaces approved the Menangle Quarry Extension – Modification 2 (MOD2). Changes to the Consent conditions are provided in the Notice of Modification for Development Consent DA 85/2865.

The Consolidated Consent ('the Consent') allows the extraction of sand and soil in a new area, the Stage 8 area (Figure 1.3), that is about 13 ha, and extends about 2 kilometres (km) along the Nepean River south of the Stage 7 area. The quarry is approved to extract sand and soil from the Stage 8 area at a rate of up to 150,000 tpa.

The extracted material will be transported to the processing area where it will be stockpiled, processed and blended with materials imported to the site, prior to being dispatched from the quarry. Operations (but not extraction) will continue in the Stage 6 and Stage 7 areas.

Modification 2 removed the requirement for an overland conveyor and replaced it with the operation of an off-road haul truck for the transfer of extracted materials from the Stage 8 area to the processing area using existing roads. There will be no additional ground disturbance as a result of MOD2.

This Aboriginal Heritage Management Plan (AHMP) has been prepared to address the requirements of the Consent.

The AHMP applies to the Stage 8 project area boundary as shown on Figure 1.3. This comprises the Stage 8 extraction area (Substages 8A–8M) and the Stage 8 restoration area which are referred to separately when relevant. The AHMP also provides management measures for a rockshelter site that is outside but in proximity to the project area, being Bulli Site 40 (AHIMS 52-2-3720 – rockshelter with art).

1.2 Project overview

The quarry has consent to extract the sand and soil resource in the Stage 8 area to 2035. The Stage 8 area extends approximately 2.8 km upstream of the currently active Stage 7 area.

As well as the extraction areas, key components of the quarry include:

- a wheel wash and weighbridge;

- a site office and amenity building;
- a workshop west of the site office;
- fuel supply tanks north of the storage shed;
- processing area, including stockpiles; and
- other minor infrastructure.

These components will be used to support activities in the Stage 8 area which include:

- extraction in the Stage 8 extraction area followed by rehabilitation;
- restoration of areas adjacent to the extraction areas; and
- haul roads.

1.3 Operations

1.3.1 Activities

Operations at the quarry comprises the following activities:

- vegetation management and clearance;
- sand and soil excavation;
- material transport by off-road haul truck;
- sorting and screening of excavated material;
- processing of excavated material;
- blending of excavated material with imported materials (permitted by the Consent and EPL 3991);
- stockpiling;
- loading of product into trucks; and
- transport of product off-site by road trucks.

1.3.2 Plant and equipment

Condition A33 of the development consent states:

All plant and equipment used on site, or to monitor the performance of the development must be:

- (a) maintained in a proper and efficient condition; and
- (b) operated in a proper and efficient manner.

Hence, regular maintenance of all plant and equipment will be logged and stored on site available for review at any time.

1.3.3 Quarry life

The Stage 8 Operations may be carried out on the site until 31 December 2035.

1.3.4 Operating hours

The quarry will operate during the approved hours in accordance with development consent Table 1.1, Condition A26, as reproduced in Table 2.1 below.

Table 1.1 Operating hours

Activity	Permissible hours
Construction work	<ul style="list-style-type: none">• 7 am to 5 pm Monday to Friday• 7 am to 1 pm Saturday• At no time on Sundays or public holidays
Quarrying operations including loading and dispatch of laden trucks	<ul style="list-style-type: none">• 6 am to 5 pm Monday to Friday• 6 am to 12 noon Saturday• At no time on Sundays or public holidays
Maintenance, security, office work, cleaning, etc	<ul style="list-style-type: none">• May be conducted at any time, provided that these activities are not audible at any residence on privately-owned land

Condition A27 of the development consent states that where police or other public authorities request that deliveries or dispatching of materials are to be carried out outside operating hours and emergency work to avoid the loss of lives, property or to prevent environmental harm is required, then these activities are permitted outside the normal operating hours. In such circumstances, the Applicant must notify the Department and affected residents prior to undertaking the activities, or as soon as is practical thereafter.

1.4 Purpose and objectives

The primary purpose of this plan is to define management of Aboriginal heritage values within project area and its vicinity. The term 'management' includes both Aboriginal heritage protection as well as mitigation of impacts on Aboriginal heritage. This AHMP includes:

- a list of all Aboriginal sites identified in the project area;
- management procedures for Aboriginal cultural heritage values within and adjacent to the project boundary;
- measures to ensure ongoing consultation with the project's registered Aboriginal parties (RAPs) and Heritage NSW;
- protocols for RAP access arrangements for Aboriginal stakeholders outside of approved disturbance areas;
- protocols for educating staff and contractors of their obligations relating to Aboriginal cultural heritage values through a site induction process;
- protocols for newly identified sites;
- protocols for suspected human skeletal materials;
- protocols for the ongoing care of salvaged Aboriginal objects (if identified and salvage is required);

- protocols for monitoring and inspection of Aboriginal sites;
- reporting requirements and site database update requirements;
- provisions for continuous improvement to the plan through auditing and plan modification; and
- provisions for review and updates of the AHMP.

This AHMP has been prepared by EMM Consulting Pty Limited (EMM) on behalf of Menangle Sand and Soil.

Menangle Sand and Soil will not commence quarrying operations in the Stage 8 Area until this AHMP is approved by the Planning Secretary.

Menangle Sand and Soil will implement the AHMP as approved by the Planning Secretary.

1.5 Authorship

This plan was prepared by EMM Associate Archaeologist Ryan Desic (BA (hons) Historical and Prehistoric Archaeology) and reviewed by EMM Archaeologist Associate Director Dr Alan Williams FSA MAACA. In accordance with Schedule 3, CoA B62(a), Ryan Desic was endorsed to prepare the AHMP by the Planning Secretary (refer Appendix C.1).

1.6 Regulatory consultation

1.6.1 AHMP preparation

In accordance with CoA B62(b), EMM on behalf of Menangle Sand and Soil consulted with Heritage NSW about the preparation of AHMP. Consultation with the Aboriginal community is addressed in Section 3.

EMM initially emailed a letter to Heritage NSW on 22 October 2020 during the preparation of the AHMP. The letter advised that the preferred consultation approach would be for Heritage NSW to review the AHMP after the RAP review period and its submission to the Department of Planning Industry and Environment (now Department of Planning and Environment, DPE) but were also offered to provide any upfront input or feedback during the AHMP preparation.

EMM discussed matters regarding the AHMP with Heritage NSW via teleconference on 1 and 7 December 2020. EMM provided a draft of the AHMP to Heritage NSW on 7 December 2020 welcoming initial feedback but acknowledging that Heritage NSW was likely to undertake a formal review after the results of Aboriginal consultation were provided and the document was issued to DPE for assessment and approval. The draft AHMP was subsequently reviewed by Heritage NSW and their comments addressed (see Appendix

Following Department of Planning, Industry and Environment (DPE) review of the draft AHMP, the final AHMP (version 2, 20 April 2021) was approved by the Planning Secretary on 14 April 2021 (Appendix D).

1.6.2 AHMP update

There will be no additional ground disturbance as a result of MOD2.

Heritage NSW was consulted during the MOD2 application process. Their comments were considered by Menangle Sand and Soil during the application process and by DPE on behalf of the Minister in approving the application and amending the Consent conditions.

The updated wording in the Consent does not affect any matters related to Aboriginal heritage and there have only been small changes to this plan. Therefore, a draft of the updated plan was not sent to the RAPs and Heritage NSW. The plan will be provided to the RAPs and Heritage NSW.

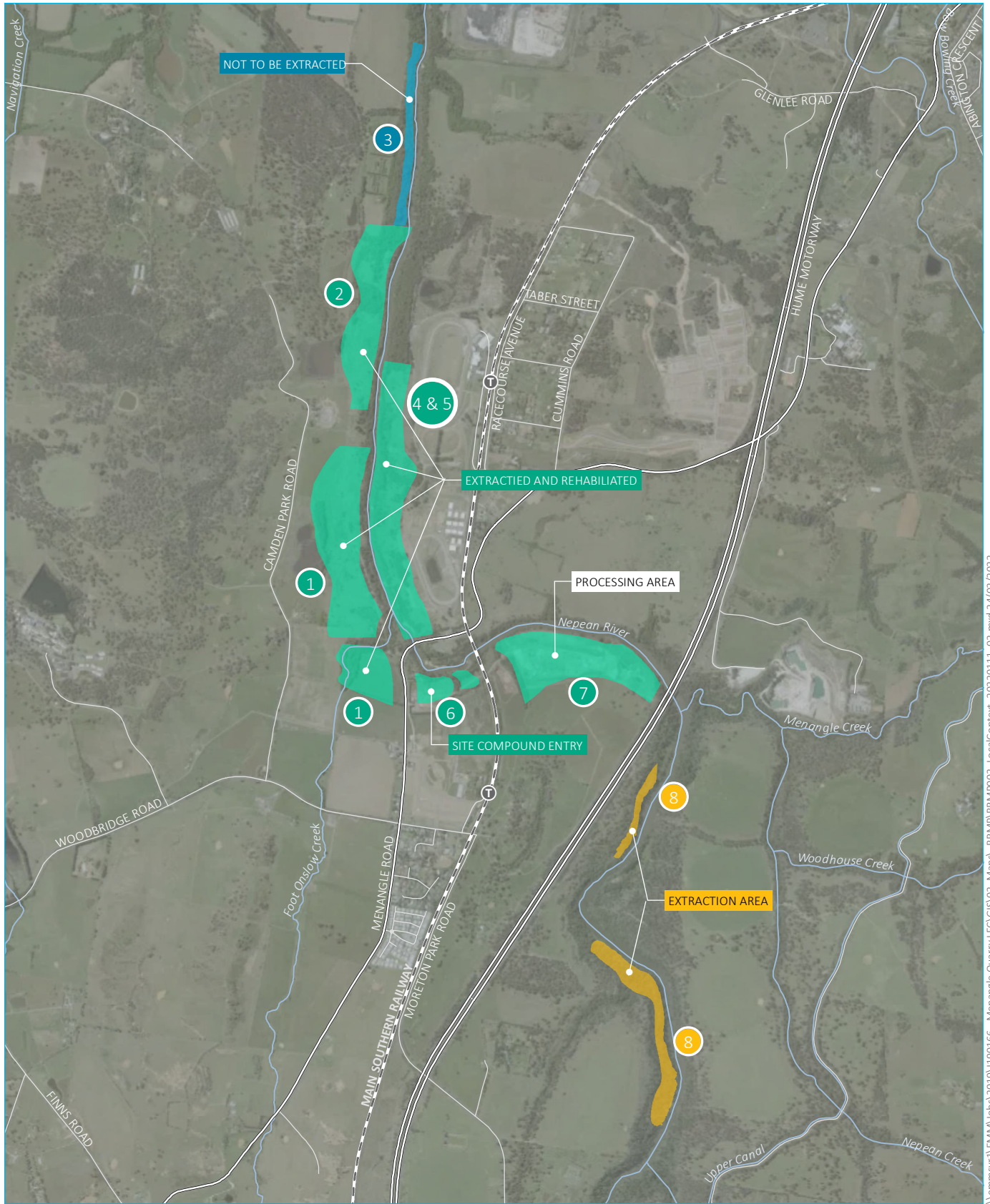


- KEY**
- Rail line
 - == Major road
 - Named watercourse
 - ▒ Named waterbody
 - NPWS reserve
 - ▭ Local government area
- INSET KEY**
- Main road
 - State forest

Regional context

Menangle Sand and Soil Quarry
Figure 1.1

\\emmsvr1\EMM\Jobs\2019\1190166 - Menangle Quarry\LEC\GIS\02_Maps\G035_Regional\Context_20220112_01.mxd 24/02/2022



Source: EMM (2022); Metromap (2022); DFSI (2017)

0 0.5 1 km
GDA 1994 MGA Zone 56

KEY

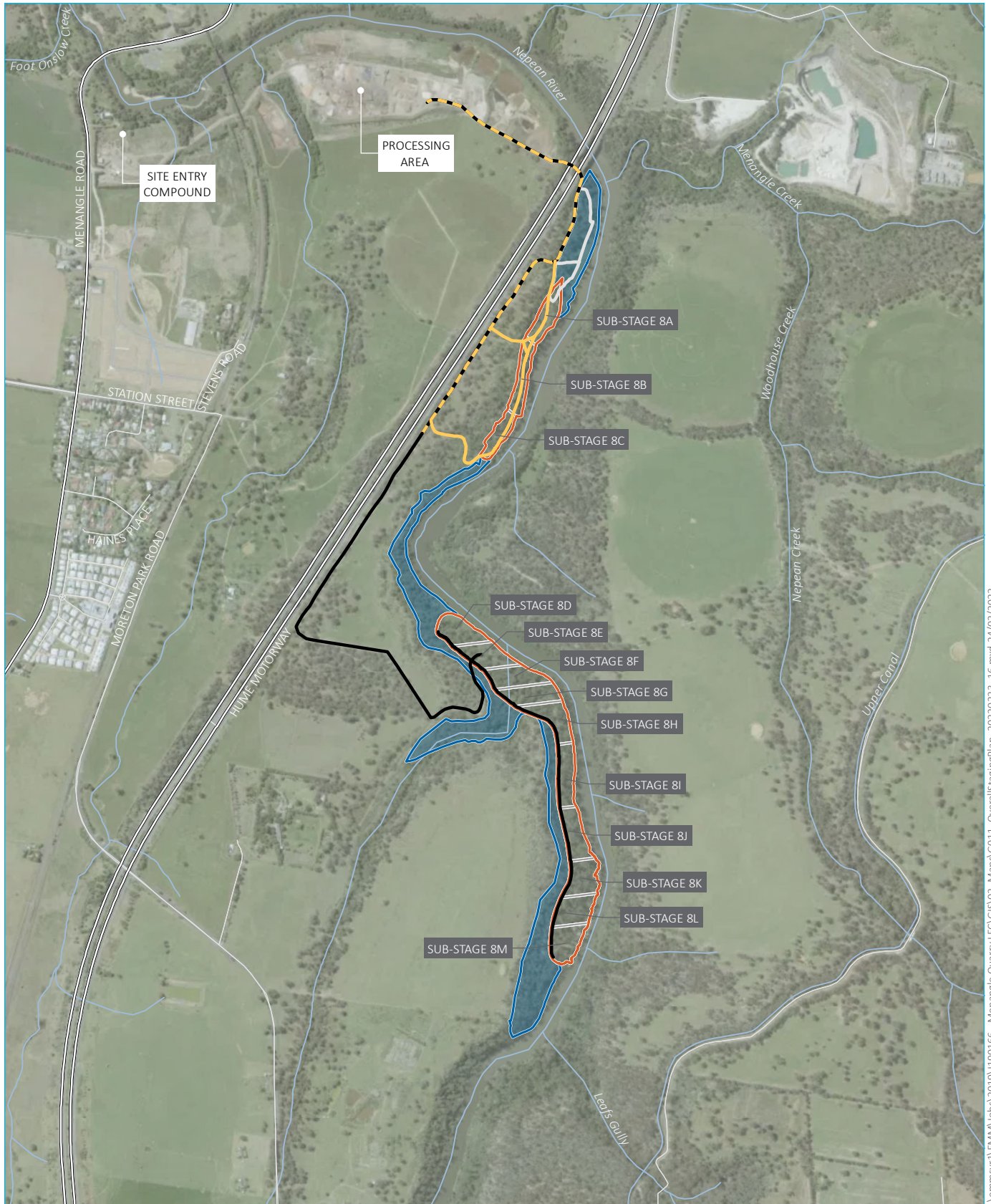
- Train station
- Rail line
- Main road
- Local road
- Named watercourse
- Extractive operations (approved)
- Extractive operations (approved but not extracted)
- Stage 8 - extraction/rehabilitation area

Menangle Quarry stages 1 to 8

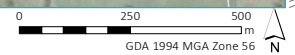
Menangle Sand and Soil Quarry
Figure 1.2



\\emmsvr1\EMM\Jobs\2019\1190166 - Menangle Quarry\EC\GIS\02_Maps\BRMP\BRMP003_localContext_20220111_02.mxd 24/02/2022



Source: EMM (2022); Metromap (2022); DFSI (2017)



KEY

- | | | |
|--|----------------|----------------------------|
| Stage 8 - extraction/rehabilitation area | Access track | Substage boundary |
| Stage 8 - restoration area (no extraction) | Haul roads | Phase 1 Sub-stages 8A - 8B |
| Main road | Substage 8A-8M | Phase 2 Sub-stage 8C |
| Local road | Substage 8A-8C | Phase 3 Sub-stages 8D - 8E |
| Watercourse/drainage line | Substage 8D-8M | Phase 4 Sub-stages 8F - 8G |
| | | Phase 5 Sub-stages 8H - 8I |
| | | Phase 6 Sub-stages 8J - 8K |
| | | Phase 7 Sub-stages 8L - 8M |

Stage 8 area

Menangle Sand and Soil Quarry
Figure 1.3



\\emmsvr1\EMM\Jobs\2019\1190166 - Menangle Quarry\EC\GIS\02_Maps\G011_OverallStagingPlan_20220223_16.mxd 24/02/2022

2 Environmental requirements

2.1 Legislative context

There are several Commonwealth and state Acts (and associated regulations) that manage and protect Aboriginal cultural heritage which are summarised in Table 2.1.

Table 2.1 Commonwealth and State legislation relevant to the project.

Legislation	Description	Relevant to the project?	Details
Commonwealth			
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	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 project area that are listed on the WHL, NHL, or the CHL.
<i>Native Title Act 1993</i>	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	No native title claim applications or determinations or Indigenous Land Use Agreements exist over the project area.
<i>Aboriginal and Torres Strait Islander Heritage Protection Act 1984</i>	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 project area subject to a Declaration under the Act.
State			
<i>Environmental Planning and Assessment Act 1979</i>	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 project was originally approved by Development Consent 85/2865, granted by the Minister for Planning on 15 November 1989. The extension project was assessed as a modification under Section 75W of the EP&A Act as the extant development consent was issued under Section 101 of the Act (refer to Clause 12 of Schedule 6A for transitional arrangements).

Table 2.1 Commonwealth and State legislation relevant to the project.

Legislation	Description	Relevant to the project?	Details
<i>National Parks and Wildlife Act 1974 (NPW Act)</i>	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	The project was originally approved by Development Consent 85/2865, granted by the Minister for Planning on 15 November 1989. DPE has advised that the NPW Act requirement for an Aboriginal heritage impact permit (AHIP) to harm Aboriginal objects remains in force for this project development consent.
<i>Aboriginal Land Rights Act 1983</i>	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, <i>Aboriginal Land Rights Act 1983 (ORALRA)</i> , registers Aboriginal land claims and maintains the Register of Aboriginal Owners. Often used in NSW to identify relevant stakeholders for consultation.	No	The project area does not appear to have Registered Aboriginal Owners pursuant to Division 3 of the Act.

2.2 Project consent conditions

Conditions B58–B64 of project approval set out Aboriginal heritage requirements. The conditions listed in Table 2.2 refer to the relevant sections of this plan which address them.

Table 2.2 Conditions of Consent relevant to this AHMP

Condition	Requirement	Where addressed in this document
Heritage Operating Conditions		
B58	The Applicant must ensure that the development does not cause any direct or indirect impact on any identified heritage item located outside the approved disturbance area.	Sections 5.1.2 and 5.1.3
B59	If suspected human remains are discovered on site, then all work surrounding the area must cease, and the area must be secured. The Applicant must immediately notify NSW Police and Heritage NSW, and work must not recommence in the area until authorised by NSW Police and Heritage NSW.	Section 5.4.3
B60	If any previously unknown Aboriginal object or Aboriginal place is discovered in the Stage 8 Area:	
(a)	all work in the immediate vicinity of the object or place must cease immediately;	Section 5.4.1
(b)	a 10 metre buffer area around the object or place must be cordoned off; and	
(c)	Heritage NSW must be contacted immediately.	

Table 2.2 Conditions of Consent relevant to this AHMP

Condition	Requirement	Where addressed in this document
B61	Work in the immediate vicinity of an object or place subject to condition B60 may only recommence if:	
(a)	the potential Aboriginal object or Aboriginal place is confirmed by Heritage NSW upon consultation with the Registered Aboriginal Parties not to be an Aboriginal object or Aboriginal Place; or	Sections 5.4.1 and 5.4.2
(b)	an Aboriginal Heritage Impact Permit is obtained under section 90 of the <i>National Parks and Wildlife Act 1974</i> , and the Aboriginal Cultural Heritage Management Plan is revised to include appropriate measures in respect the Aboriginal object or Aboriginal place, to the satisfaction of the Planning Secretary.	
Aboriginal Cultural Heritage Management Plan		
B62	The Applicant must prepare an Aboriginal Cultural Heritage Management Plan for the development to the satisfaction of the Planning Secretary. This plan must:	This document
(a)	be prepared by suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary;	Section 1.5
(b)	be prepared in consultation with Heritage NSW and Registered Aboriginal Parties;	Section 1.6 (Heritage NSW) Section 3.3 (RAPs)
(c)	describe the measures to be implemented within the Stage 8 Area, Nepean River Buffer Zone and Restoration Area to:	
(i)	ensure all workers on the site receive suitable Aboriginal cultural heritage inductions prior to carrying out any activities which may cause impacts to Aboriginal objects or Aboriginal places, and that suitable records are kept of these inductions;	Section 6.1
(ii)	protect, monitor and manage Aboriginal objects and Aboriginal places;	Section 5
(iii)	protect Aboriginal objects and Aboriginal places located outside the approved disturbance area from impacts of the development;	Section 5.1 Section 5.4.2
(iv)	manage any new Aboriginal objects or Aboriginal places discovered during the life of the development;	Section 5.4
(v)	maintain and manage reasonable access for relevant Aboriginal stakeholders to Aboriginal objects and Aboriginal places (outside of the approved disturbance area); and	Section 3.4.2
(vi)	facilitate ongoing consultation and involvement of Registered Aboriginal Parties in the conservation and management of Aboriginal cultural heritage on the site.	Section 3.4
B63	The Applicant must not commence Quarrying Operations in the Stage 8 Area until the Aboriginal Cultural Heritage Management Plan is approved by the Planning Secretary.	Section 1.4
B64	The Applicant must implement the Aboriginal Cultural Heritage Management Plan approved by the Planning Secretary.	Section 1.4

3 Aboriginal consultation protocols

3.1 Registered Aboriginal parties

There are seven Aboriginal groups registered for the project (Table 3.1). The RAPs were identified, registered and consulted as part of the ACHA (EMM 2016). Previous consultation included discussion of the management measures which were outlined in the ACHA and are detailed in this AHMP.

Table 3.1 List of RAPs

Organisation	Date of registration
Cubbitch Barta Native Title Claimants Aboriginal Corporation (Cubbitch Barta)	1 Jun 2016
Peter Falk Consultancy (now Duncan Falk Consultancy)	14 Jun 2016
Gulaga	15 Jun 2016
Biamanga	15 Jun 2016
Callendulla	15 Jun 2016
Murramarang	15 Jun 2016
Goobah	15 Jun 2016
Tharawal Local Aboriginal Land Council	Not formally registered but consulted throughout the modification application, since July 2016

3.2 Consultation process for the EA

The following summary of the Aboriginal consultation process followed for the EA is based on the more extensive account given in the ACHAR (EMM 2016).

The *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010a) were used for the ACHA. RAPs were invited to provide cultural information about the project area, were provided with draft assessment and fieldwork methods for review and kept consulted about project updates and management via a consultation meeting, letters and emails and provided with assessment documentation for review and comment. A summary of the main consultation components during the EA phase is provided in Table 3.2.

Table 3.2 Summary of consultation for the project EA

Component	Key features
May–November (EMM 2016) Main ACHA consultation component	<p>This phase included:</p> <ul style="list-style-type: none"> • the identification, notification and registration of RAPs; • presentation of project information and assessment methodologies (including on-site meeting on 23 September 2016); • gathering cultural information; • archaeological survey (April 2016); • archaeological test excavation (October 2016) • provision of draft ACHA for RAP review (November–December 2016); and • provision of final ACHA to RAPs as part of EA lodgement.

3.3 Consultation in developing this plan

In accordance with CoA B62(b), EMM consulted RAPs in developing this plan. Documentation of the consultation process is included in Appendix B.

Aboriginal consultation for this AHMP was approached in a manner consistent with the requirements set out in the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010a). Consultation was undertaken with existing RAPs who have been involved in the consultation process since the preparation of the ACHA (refer Section 3.1).

RAPs were notified via letter about the intention for EMM to prepare the AHMP on 22 October 2020. The notification letter outlined the consultation process for the AHMP and identified key matters to be discussed for the AHMP.

A draft of this AHMP was provided to all of the RAPs on 11 December 2020 allowing for a 28-day review period. The draft report included highlighted text indicating sections where RAP input was sought in reference to particular management decisions, such as the keeping place location. RAPs were also issued with a cover letter explaining the review process and highlighting where key input was sought.

Responses were received by Cubbitch Barta, Goobah, Murramarang, and Biamanga. A summary of RAP submissions and outcomes relating to the AHMP are presented in Table 3.3. Appendix B contains Cubbitch Barta’s detailed letter and EMM’s response along with copies of the other RAP submissions.

Table 3.3 Outcomes of consultation with RAPs (RAP submissions attached in Appendix B)

Stakeholder	Issue or recommendation (EMM paraphrase from submission)	Response and where issue is addressed in AHMP if applicable
Cubbitch Barta	Concern over environmental impact of the project, with specific reference to native old growth trees that will be destroyed.	This issue was previously raised during the ACHA phase of the project and addressed during that consultation period. This comment refers to the approval of the project in general and not the contents of the AHMP. Notwithstanding, EMM has provided a response attached in Appendix B. No changes to the AHMP have been made from this submission topic.
Cubbitch Barta	Cubbitch Barta raised an issue about the difference between vegetation removal and topsoil removal.	This was clarified in EMM’s response letter and did not require changes to the AHMP.

Table 3.3 Outcomes of consultation with RAPs (RAP submissions attached in Appendix B)

Stakeholder	Issue or recommendation (EMM paraphrase from submission)	Response and where issue is addressed in AHMP if applicable
Cubbitch Barta	Statement that no work should take place in areas not previously surveyed until further assessment has taken place.	EMM’s response letter (Appendix B) referred to Section 5.2 of the AHMP which states that additional survey prior to works in the Stage 8 extraction area will take place after the understorey is cleared and prior to the removal of mature trees to determine if any feature Aboriginal scarring or carving; and additional survey will take place for rock shelters in the Stage 8 restoration area.
Cubbitch Barta	Concern over impacting and removing Aboriginal scarred trees if identified.	This is addressed in Appendix B. No Aboriginal scarred or carved trees have been identified in the project area, but the trees will be subject to further survey once weeds are removed and they can be accessed. Note that any proposal to impact Aboriginal objects in the project area would require an Aboriginal Heritage Impact Permit (AHIP) issued by Heritage NSW. Section 5.4.2 of the AHMP sets out the level of assessment that will be required to accompany an AHIP application, including an impact assessment and demonstration why any site(s) in question cannot be reasonably avoided.
Murramarang	Supported the draft AHMP	None required
Biamanga	Supported the draft AHMP	None required
Goobah	Supported the draft AHMP	None required

3.4 Ongoing consultation

3.4.1 All RAPs to be kept informed

The RAPs will continue to be consulted on matters of Aboriginal heritage management for the project. Primary communication will be via letter which may be emailed or posted depending on RAP preferred means of communication. Issues raised in conversations, whether by telephone or in person, should be documented in a letter by the person raising the issue within a reasonable time of the conversation. Only suitably documented issues will be subject to further action by Menangle Sand and Soil with the RAPs.

Instances where consultation is required is set out throughout this report. In summary, consultation will be undertaken for (but may not be limited to) the following circumstances:

- when making changes to this plan, including the circumstances that trigger required changes to the plan (refer Section 6.3.6);
- when additional Aboriginal heritage assessment, investigation, protection or mitigation is required for the project; and
- when new Aboriginal sites and/or potential ancestral remains are discovered and input on their management is required (refer Section 5.4).

Menangle Sand and Soil will be responsible for consulting with the RAPs. Issues requiring the attention of RAPs will be communicated no later than one week of the issue arising. Feedback from RAPs is required no later than two weeks from the date correspondence is issued by Menangle Sand and Soil. Notwithstanding, review and feedback timeframes will be extended during periods such as Sorry Business or holidays. These extensions will be commensurate with period where RAPs are unable to conduct other activities.

3.4.2 Access to Aboriginal sites and objects

In accordance with CoA B62(c)(v), the AHMP must maintain and manage reasonable access for relevant Aboriginal stakeholders to Aboriginal objects and Aboriginal places (outside of the approved disturbance area). The primary aims of Aboriginal community access of these sites will be to achieve intergenerational equity through maintaining a cultural connection to Country and using the sites as cultural education tools.

Local Aboriginal community site visitation access Aboriginal sites and objects will be subject to the following provisions:

- given reasonable notice, visitation access to the Stage 8 area will be provided during quarry operating hours, in line with all safety and security requirements;
- access must comply with the facility's operational work health and safety (WHS) requirements, including appropriate transport to the Aboriginal heritage sites and a Menangle Sand and Soil site escort, if applicable;
- all visitors must log their attendance on a register made available by Menangle Sand and Soil to all RAPs (held on site);
- RAPs must give at least one week's notice to Menangle Sand and Soil or its delegate about their intent to access the project area and which sites wish to be visited;
- a RAP member may escort other members of the local Aboriginal community or other persons for research or educational reasons, on the condition that all proposed attendees give at least one week's notice written notice; and
- local Aboriginal community members seeking access to a RAP escort must receive prior written endorsement from one of the RAPs which identifies the name of the person, briefly describes their basis of interest and nominates the timeframe for access to the Aboriginal sites in order to provide confidence to Menangle Sand and Soil or their delegate and RAPs that the access request is authentic. At least two weeks' notice will need to be provided to Menangle Sand and Soil or its delegate.

3.4.3 Aboriginal involvement in Aboriginal heritage management measures

RAPs will be invited to provide a fieldwork representative to participate in Aboriginal heritage fieldwork activities as under contractual arrangement with Menangle Sand and Soil as presented in Section 5. Depending on the scope of specific management tasks, RAP fieldwork representatives may be required to work to a roster in an equal manner consistent with that employed during the project ACHA. All fieldwork management tasks will include at least one project archaeologist and will work in accordance with this plan.

RAPs will also be invited to assist in relevant Aboriginal heritage related fieldwork related to additional assessments as outlined in Section 6.3.5 where required.

RAPs will be provided with at least 14 days' notice prior to any fieldwork associated with this plan.

4 Existing environment

4.1 Overview

The Aboriginal cultural heritage values of relevance to the project were identified during the preparation of the project ACHA through archaeological investigation and Aboriginal community consultation with RAPs (EMM 2016). This section provides an overview of the Aboriginal sites and Aboriginal socio-cultural values relevant to the project as detailed in the project ACHA to provide context for the management provisions set out in Section 5.

4.2 Aboriginal socio-cultural and historical values

During ACHA preparation, the RAPs were consulted to determine whether any socio-cultural or historic heritage value relates specifically to the project area more broadly regardless of archaeological evidence. As a result of the consultation process, RAP Cubbitch Barta identified three types of intangible Aboriginal cultural heritage values during the consultation process.

The first type of values relate to the Nepean River which Cubbitch Barta identified as being culturally significant to the wider Aboriginal community. The Nepean River would have influenced many aspects of prehistoric Aboriginal life (eg resources and spiritual and cultural practices) and has continued as an important landscape feature up until the present. However, it is problematic to make management measures (other than complete avoidance) that respond to the general significance of the total Nepean River because it extends over a considerable geographic extent. No specific management measures for managing the cultural significance were proposed in the ACHA and are also not extended into the AHMP. Notwithstanding, the ACHA noted that the removal of exotic weeds and restoration of the project area will result in the Nepean River and its surrounds to ecologically resemble its pre-historic form to a level greater than it currently is.

The second type of values relate to a specific place (non-statutory) associated spiritual and traditional knowledge by Cubbitch Barta. This place was identified as associated with culturally sensitive information that was requested not to be shared publicly. EMM confirmed that the place is outside the Stage 8 impact areas and, because it relates to culturally sensitive knowledge, further information about the place was not provided to EMM. The project will avoid this area and no specific management measures for this area are set out in the AHMP.

The third type of values relates to the more recent and historic value Cubbitch Barta has associated with the Nepean River surrounding the Stage 8 area. This level of significance specifically relates to Glenda Chalker's family, including the continuation of cultural practices including fishing and collecting freshwater mussels. No management measures to address this were presented in the ACHA nor are proposed for this set of values in the AHMP. Note that the Nepean River will still be accessible generally from other land surrounding the Stage 8 area.

4.3 Summary of project ACHA and Aboriginal sites

The preparation of the Aboriginal cultural heritage assessment (ACHA) for the modification application included:

- background research of the Stage 8 area's environmental, archaeological and ethno-historical context;
- Aboriginal consultation in accordance with the *Aboriginal Consultation Requirements for Proponents 21010* (DECCW 2010c);
- an archaeological survey, geoarchaeological survey and test excavation program; and

- an assessment of archaeological, socio-cultural and historical values (significance to the Aboriginal community); impacts of the project and management for the identified Aboriginal cultural heritage values using the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (DECCW 2010b).

The archaeological survey and test excavation results, Aboriginal sites and proposed project impacts are summarised in Table 4.1 and shown on Figure 4.1. No other Aboriginal sites or areas of PAD relevant to the project area were identified during the project ACHA (EMM 2016).

In summary, the assessment found:

- The project area includes three distinct landform types adjacent to the Nepean River, comprising a lower terrace, upper terrace and sandstone escarpment (scarp). Each landform was assessed of its archaeological potential.
- Six known (recorded) Aboriginal sites relevant to the project. This comprises one confirmed Aboriginal site (Bulli Site 40, AHIMS #52-2-3720 – rockshelter with art) that was recorded prior to the project ACHA, and five rockshelters with PAD (sites MQ1–MQ5) that were recorded during the project ACHA but have not been confirmed to feature Aboriginal objects (eg art, engravings or stone artefacts). The Aboriginal sites were identified and assessed through review of AHIMS data and targeted archaeological survey and all occur on the scarp landform outside of the Stage 8 extraction area.
- No Aboriginal objects were identified through targeted test excavation in the Stage 8 extraction area and the upper and lower terrace landforms are considered to have low archaeological potential for subsurface archaeological deposits, primarily because of their geomorphological depositional sequence (EMM 2016 p.63). No other Aboriginal sites or areas of PAD relevant to the project area were identified during the project ACHA.
- The scarp landform is suitable to feature Aboriginal rock shelters sites. There is potential for further rockshelters to occur in the Stage 8 restoration area, but many areas were inaccessible due to thick vegetation cover.
- The project will not impact the known Aboriginal rockshelter sites relevant to the project.
- There is some residual potential for Aboriginal scar trees to occur within the Stage 8 extraction area as there are mature native trees that couldn't be accessed due to thick vegetation cover.
- The escarpment at the western boundary of the Stage 8 extraction area has been buried by sediment accumulation of the Nepean River. As such, there is a theoretical potential for buried rockshelter or other sandstone-type sites (eg engravings or grinding grooves) to be buried and potentially exposed by project works in the Stage 8 extraction area. This has been based on the geoarchaeological assessment completed for the ACHA.

The Aboriginal sites and predicted project impacts are summarised in Table 4.1 and shown on Figure 4.1. No other Aboriginal sites or areas of PAD relevant to the project area were identified during the project ACHA (EMM 2016).

Table 4.1 Known Aboriginal sites

Site Name	AHIMS	Site type	Archaeological significance	Relationship to the project area	Predicted project impacts
Bulli Site 40	52-2-3720	Aboriginal rockshelter with art and PAD	Not specified on AHIMS site card. However, presence of 7 art motifs and PAD indicates moderate to high archaeological significance.	350 m west of Stage 8 extraction area 30 m south-west of Stage 8 restoration area	None: avoidance
MQ1	TBC	Rockshelter with PAD	Low: Problematic shelter with limited floor space, difficult to access on a steep slope.	Within 20 m of Stage 8 extraction area Inside Stage 8 restoration area	None: avoidance
MQ2	52-2-4636	Rockshelter with PAD	Moderate: Moderate PAD area with minor disturbance.	Within 20 m of Stage 8 extraction area Inside Stage 8 restoration area	None: avoidance
MQ3	52-2-4637	Rockshelter with PAD	Low: Problematic shelter with limited floor space, very exposed due to narrow shelter with high roof height and difficult to access.	Within 20 m of Stage 8 extraction area Inside Stage 8 restoration area	None: avoidance
MQ4	52-2-4638	Rockshelter with PAD	Low: Limited floor area and low ceiling height, moderately accessible on moderately inclined slope.	Within 50 m of Stage 8 extraction area Inside Stage 8 restoration area	None: avoidance
MQ5	52-2-4639	Rockshelter with PAD	Low: Limited floor area and low ceiling height, moderately accessible on moderately inclined slope.	Within 50 m of Stage 8 extraction area Inside Stage 8 restoration area	None: avoidance

4.4 Limitations of project ACHA

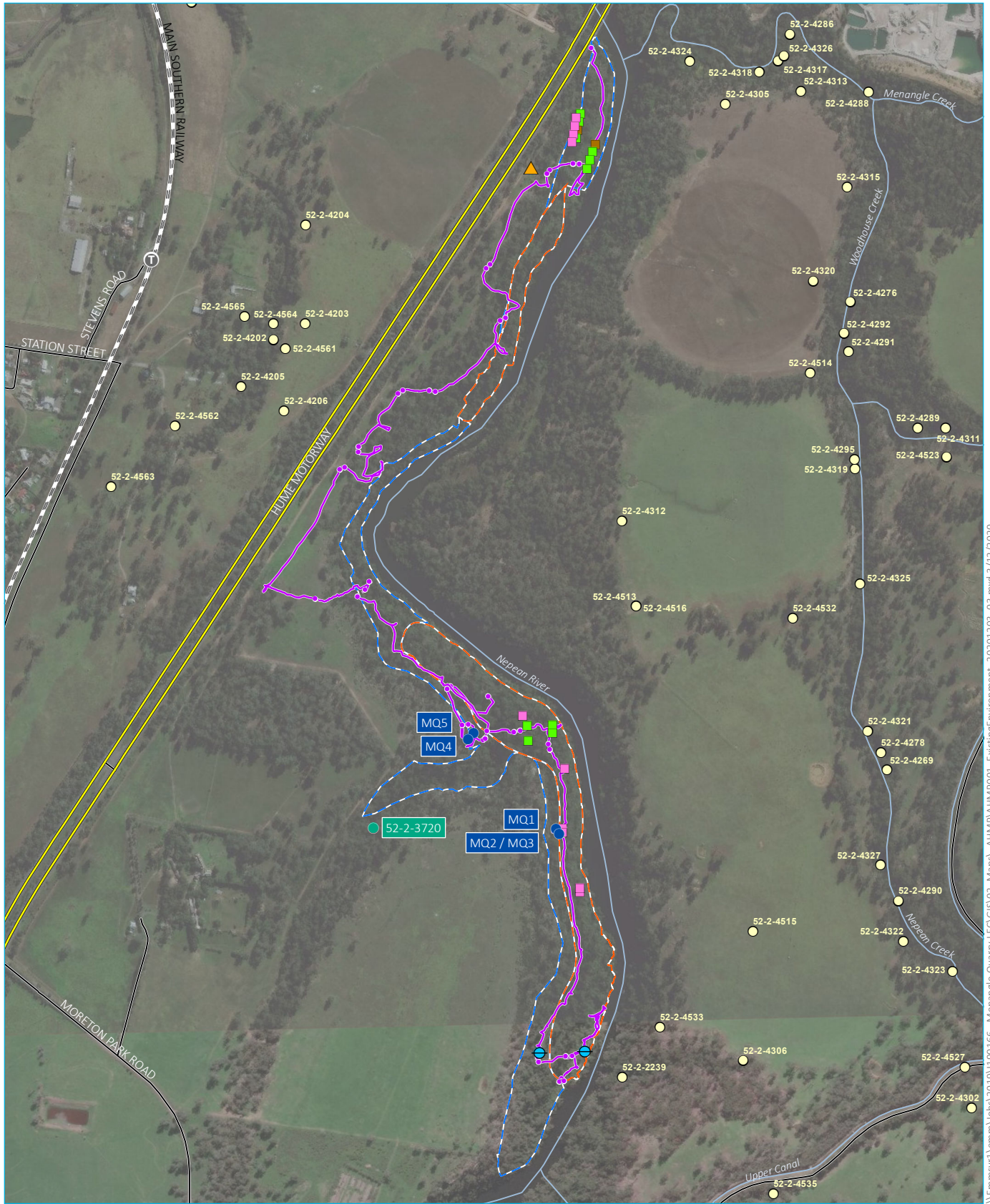
Certain limitations of the ACHA have influenced some of the provisions of this management plan. They are summarised here to provide context for the necessity of their inclusion in this AHMP.

The archaeological survey component of the project ACHA was limited by dense vegetation throughout the Stage 8 area combined with the generally low ground surface visibility conditions. There were parts of the upper and lower terrace that could not be accessed across the project area. This meant that the survey was not effective for inspecting mature trees within the riparian community of Bangalay crossed with Sydney Blue Gum for Aboriginal scarring or carving within the project area. Even some of the trees within the surveyed areas had almost 3 m of their trunks obscured by a vegetated understory (the parts most likely to feature scarring or carving). Conservatively, these trees may be of suitable age to feature Aboriginal scarring or carving that cannot be discounted until inspected. As such, despite being a relatively uncommon site in the local area, there is some potential for unknown modified trees to be impacted by the project. A pre-clearance survey will enable identification of culturally modified trees (if any) in the Stage 8 extraction area (refer Section 5.2.3).

Note that no mature trees will be impacted in the Stage 8 restoration area, nor the Stage 8 access corridor, as only exotic plants will be removed, and native trees will be conserved.

The focus of the project ACHA was on the Stage 8 extraction area which theoretically had the most potential to impact Aboriginal objects through significant earthworks. The Stage 8 restoration area was not targeted for archaeological investigations as the impacts proposed at the time were limited to exotic weed removal without the method of removal specified. Since the project EA in 2016, the method of exotic weed removal had been defined and will involve machine removal of between approximately 200 mm and 300 mm of topsoil in some areas on upper terrace and scarp landforms that were not previously subject to archaeological survey. Clearing and topsoil removal is described in Sections 5.2 of the *Menangle Sand and Soil Quarry Biodiversity and Rehabilitation Management Plan* (BRMP). Furthermore, land within portions of the Stage 8 restoration area will be used for hauling material on existing tracks.

There is some potential for previously unrecorded Aboriginal rockshelters to occur in the restoration area. As such, additional survey to identify and protect (if applicable) further rockshelters will be undertaken in the Stage 8 restoration area (refer Section 5.3).



Source: EMM (2020); DFSI (2017); GA (2011)



KEY

- ▭ Stage 8 - extraction/rehabilitation area
- ▭ Stage 8 - restoration area (no extraction)
- Train station
- Rail line
- Main road
- Local road
- Named watercourse
- Survey transect
- Geoaerchaeology boreholes
- Test pit locations
- hand
- hand/machine
- machine
- ▲ Proposed artefact reburial location
- Aboriginal site
- Rock shelter with PAD
- Rock shelter with art & PAD
- AHIMS site

Existing environment

Menangle Sand and Soil
Aboriginal heritage management plan
Figure 4.1



\\Emmsvr1\emmm\loba\2019\190166 - Menangle Quarry LEC\GIS\02_Maps\AHM\PA_HM\PO01_ExistingEnvironment_20201203_03.mxd 3/12/2020

5 Aboriginal heritage management

5.1 Management of known sites

Aboriginal heritage management over the life of the project for currently known (ie the six rockshelter) sites will take the form of protective measures for sites that will be avoided by project impacts. These measures apply to the six rockshelter sites as presented on Figure 4.1, Table 4.1 and Appendix A.

5.1.1 Active or passive protection

Aboriginal sites that are not identified as being impacted by the ACHA will be protected. Either active or passive protection measures will be implemented. Active management means construction of temporary or permanent barriers, installation of signage and controls on access by those undertaking activities within the project boundary. Passive management means no fencing or signage will be applied if sites are at limited risk of inadvertent impacts because they are a suitable distance from the disturbance footprints.

5.1.2 Active protection

Rockshelters MQ1 to MQ5 are outside of the Stage 8 extraction area but within the Stage 8 restoration area which will undergo exotic weed removal. This will also involve a component of topsoil stripping in some areas. The rockshelters and surrounding scarp are generally devoid of vegetation requiring removal, but nevertheless will have protective measures established to avoid any inadvertent impacts to shelter PAD areas or the structural integrity of the sandstone shelter features. This method will also apply to any newly identified Aboriginal rockshelters within the project area.

Site Bulli Seam 40 (AHIMS #52-2-3720) is outside the project area but within 50 m, and therefore will receive active protection too.

Protection buffer zones will be established for a 10 m radius around the observed extent of each rockshelter (including any PAD that extends beyond the shelter). The buffer zones will be demarcated using stake and wire fencing prior to extraction or restoration activities. The placement of fencing will be guided by markers set out by a suitably qualified archaeologist.

A durable sign will be attached to the fencing including words to the effect of:

Environmentally sensitive area

Do not disturb

Contact the Property Manager on [phone number].

Weed management associated with Stage 8 restoration activities in the Nepean River Buffer Zone will be limited to non-invasive measures such as cutting vegetation at its base and treating with weed control products. No ground disturbance activities such as uprooting vegetation or topsoil removal is permitted in this zone. Weed management will be implemented according to industry best management practice for the weed species present in accordance with relevant sections of Sections 6 and 7 of the *Biodiversity and Rehabilitation Management Plan*, but tailored to an approach which will not involve ground disturbance.

5.1.3 Passive protection away from project activities

Passive management is not proposed for the currently known sites. However, if new sites are identified on Menangle Sand and Soil property over 50 m from the project area (Stage 8 extraction and restoration areas), passive management will apply. While no fencing, signage or active land management measures are proposed for these sites, their locations will be kept by Menangle Sand and Soil for persons working on or visiting the project boundary. Their presence in the landscape will be demarcated by at least one high visibility peg, stake or other marker to alert persons to their location. These locations will be marked by a suitably qualified archaeologist.

5.2 Additional survey and management

5.2.1 Purpose

Additional archaeological survey is required to account for any unidentified Aboriginal scar trees and rockshelters in the project area due to the limitations of the project ACHA described in Section 4.4 of this AHMP. The following section provides details of survey requirements, staging and timing.

5.2.2 Stage 8 extraction area

The project ACHA identified that the Stage 8 extraction area contains mature native trees that are potentially over 100 years old. Currently much of the Stage 8 area is too overgrown with weeds to allow adequate access to inspect all mature trees. Therefore, an additional survey will be undertaken in the Stage 8 extraction area after the understorey is cleared and prior to the removal of mature trees to determine if any feature Aboriginal scarring or carving. The survey will use the methods:

- The tree survey will be completed across the entirety of the Stage 8 extraction footprint by the project archaeologist and RAP representatives.
- The survey may be completed in a staged approach in keeping with the extraction Sub-stages 8A to 8M or any variation or grouping of such stages. Menangle Sand and Soil should stage approaches with consideration to potential AHIP timeframes as set out in Section 5.4.2 of the AHMP, given that any required AHIP may require an approximate 4-month timeframe and must precede project-related impacts.
- The survey must be completed after removal of the vegetation understorey to a level that exposes the entirety of each mature tree trunk suitable for access and visual inspection.
- GPS coordinates and photographs will be taken for each inspected mature tree.
- A short report will be prepared by the project archaeologist documenting the outcomes of each fieldwork stint, inclusive of a figure showing the locations of the trees inspected. These reports will be issued to RAPs and Heritage NSW and kept by Menangle Sand and Soil for their internal records. If the Aboriginal sites are identified, the reports will be submitted as part of AHIMS site cards and lodged on the AHIMS register.
- If no Aboriginal scarred or carved trees or other Aboriginal objects are identified in the relevant portion of the Stage 8 extraction surveyed area during each stint, the report will provide clearance for project works to proceed (subject to other relevant environmental approvals or requirements).
- If Aboriginal scarred or carved trees, or other Aboriginal objects are identified and cannot be avoided, the new finds management procedures set out in Section 5.4.2 will be followed. This includes the requirement for all work in the immediate vicinity to cease and a 10 m buffer area around the object must be cordoned

off. A report detailing the fulfilment of relevant provisions of this AHMP will be required by the project archaeologist prior to project works proceeding in cordoned off area of the identified site.

5.2.3 Stage 8 restoration area:

i Survey for rock shelters

The project ACHA identified areas of scarp in the vicinity of the project area using GIS slope analysis teamed with visual observations during the archaeological survey. All scarp landform in the project area occurs outside of the Stage 8 extraction area and all to the south of the Sub-stage 8C area within the Stage 8 restoration area (Figure 1.3).

Only small sections of the scarp were targeted during the archaeological investigation because they were previously outside of proposed ground disturbance and also inaccessible due to dense vegetation. Furthermore, the targeted sections of scarp were heavily vegetated which may have obscured any rockshelters in the restoration area additional to MQ1–MQ5.

Archaeological survey will be undertaken by the project Archaeologist and RAP representatives in scarp landforms within the restoration area. The survey will be undertaken prior to invasive vegetation clearance (ie vegetation clearance that involves ground disturbance) of the scarp landforms. Depending on the density of vegetation, and resulting access constraints, it is likely that some level of mechanical and/or hand tool vegetation clearance on upper terrace landforms will be required, along with some preliminary non-ground-invasive vegetation on the scarp landforms to allow the scarp to be adequately inspected. The type of mechanical vegetation removal will be consistent with the methods described in the BRMP.

If additional rockshelter sites are identified during survey, they will receive the same active protection measures as presented in Section 5.1.2.

ii Survey of haul road

Existing tracks will be used as haul roads so no vegetation removal, other than pruning branches adjacent to the tracks, will be required. If any additional ground disturbance is required, archaeological survey for the identification of Aboriginal modified trees will be completed. The survey strategy in Section 5.2.2 will be employed.

5.3 Avoidance of buried sandstone features

Geotechnical borehole investigations completed by geoarchaeologist Sam Player as part of the project ACHA indicate that the sandstone escarpment continues below the ground surface in the Stage 8 extraction area on an angle that slopes toward the Nepean River. As such, there is a buried sandstone escarpment that continues beneath the upper terrace landform in the Stage 8 extraction area that will be subject to extraction. As the nature of this buried landscape is currently undefined, there is some residual risk that there are buried rockshelters or other sandstone-type sites (eg engravings or grinding grooves) to occur along the western boundary of the Stage 8 extraction area.

The sand and soil resource in the Stage 8 area will be extracted using an excavator and off-road haul truck. No vibrational impacts to nearby sandstone features are anticipated from this extraction method, given that machinery will only extract the sand and soil resource and will not interact with bedrock.

To reduce the risk of impacting unknown Aboriginal objects that are part of the buried escarpment, Menangle Sand and Soil will employ the following extraction controls:

- Machinery will exercise caution when excavating near existing exposed sandstone escarpment, and during contouring of the landward batter near sandstone escarpment features. Areas of existing visible sandstone

escarpment indicates where the escarpment is likely to continue into the Stage 8 extraction area and should be used as a guide to advise contractors where to employ caution. Currently this comprises the substages 8D to 8M areas but would also apply if other areas of escarpment are exposed during the extraction process.

- Works will stop if machinery encounters sandstone features (sandstone bedrock expanses, cliff or overhang features) during extraction. Machinery is not permitted to excavate, scrape, or demolish identified sandstone features. Before recommencing works, Menangle Sand and Soil will reassess their work plan within the area and attempt to leave a 50 cm layer of soil over sandstone features to avoid inadvertent impacts – this may require probing or other geophysical survey to establish the location of the sandstone escarpment (subject to the predictability of where the sandstone escarpment occurs).
- If suspected rockshelters, grinding grooves and engravings are exposed during extraction, works in that area will cease. Menangle Sand and Soil will contact a qualified archaeologist to inspect the find. The archaeologist will aim to verify the find and to establish suitable buffers to avoid any archaeological features. In general, the active avoidance measures as set out in 5.1.2 will be employed. Additionally, any buffers applied to sandstone features must consider:
 - measures to avoid impacting the structural features of rockshelters – ie the overhang, ceiling, inside and base;
 - measures to avoid any areas of potential archaeological deposit at the base of the rock shelter or any prior land surface that extends beyond the limits of the rockshelter feature; and
 - measures to avoid scraping, excavating or damaging exposed sandstone of grinding grooves or engravings, and the surrounding bedrock/rockbar that hosts the features.

Archaeological monitoring by an archaeologist may be required to establish suitable buffers to archaeological features during mechanical extraction in the area. Works will not proceed until the feature is appropriately protected and demarcated and a letter is prepared by the archaeologist confirming works may proceed. Heritage NSW and RAPs will be notified about the identification of any newly identified sites and the site will be registered on AHIMS.

5.4 New finds procedures

5.4.1 Discovery of new Aboriginal sites

In the event of discovery of suspected new Aboriginal sites within the project area during the life of the project, the following will apply:

- all work within the vicinity (minimum of 10 m) of the object or place will cease immediately;
- a minimum of 10 m around the site will be secured to protect the find with temporary fencing and the find will be immediately reported to the work supervisor who will immediately advise the Menangle Sand and Soil environmental manager or other nominated senior staff member;
- Heritage NSW will be contacted immediately and informed that a potential Aboriginal object or place has been identified and that an archaeologist will undertake further investigation to verify the nature of the unexpected find;
- an archaeologist must be contacted within five days of the find to validate the find and determine the archaeological significance of the object(s);

- if the object is determined not to be an Aboriginal object or place by the archaeologist, Heritage NSW and RAPs will be notified of this assessment in writing. RAPs will be given 5 days to review the assessment of the potential object or place and provide comments or feedback. If no feedback is provided, then the assumption is that there are no issues with the assessment. Heritage NSW will be advised on the outcome of the assessment and consultation. Works will only recommence within the vicinity of the find after Heritage NSW confirms that the find is not an Aboriginal object or place;
- if considered cultural, the site will be recorded in accordance with current best practice archaeological methods and guidelines and Heritage NSW and RAPs will be notified of this assessment and determination;
- assessments of archaeological significance will be documented in a letter report in a manner consistent with the significance assessment for the project ACHA;
- if the find is determined to be an Aboriginal object, RAPs will be contacted to determine the cultural significance of the find and have input into desired management measures;
- any new sites will be registered on the AHIMs database (refer Section 6.3.2); and
- any new sites will be added to the AHMP site inventory during its next review and update cycle.

5.4.2 Management of new Aboriginal sites

Newly identified sites that are not at risk of impact (ie over 50 m from the project area) will be avoided through passive protection (Section 5.1.3). Avoidable sites that are within 50 m of the project area will be managed through active protection measures identified in this plan (refer Section 5.1.2). Note that avoidance of newly identified Aboriginal objects is always the preferred heritage outcome. Mitigation measures should only be employed when it can be reasonably demonstrated that avoidance is not feasible.

Table 5.1 sets out the measures that will be employed for newly identified Aboriginal sites, subject to the approval of an Aboriginal heritage impact permit (AHIP) issued by Heritage NSW that endorses these methods in accordance with CoA B61 (b). The following procedure will be undertaken if an AHIP is required:

- The existing project ACHA (EMM 2016) will be used as the base supporting documentation for AHIP application(s). If new Aboriginal site(s) are identified and cannot be avoided by project activities, then an ACHA addendum assessment must be prepared to support an AHIP application. The addendum assessment must:
 - be completed by a suitably qualified archaeologist.
 - clearly describe the site, its location and boundaries.
 - assess the site's archaeological and cultural significance – if applicable, this may require further investigative measures in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (the Code). If archaeological test excavation is required, it may be completed in accordance with the Code. However, if test excavation is needed in a scenario that does not comply with the Code, an AHIP may be required to carry out test excavations.
 - include an impact assessment and demonstrate why the site cannot be reasonably avoided if impacts are proposed.
 - provide appropriate protective or mitigative management measures for the site(s). The measures listed in Table 5.1 provide general terms of reference for management measures.

- include evidence of the outcomes of consultation with the project RAPs listed in Table 3.1 of this document.
- AHIP applications should be lodged to heritagemailbox@environment.nsw.gov.au and include an AHIP application form, the EMM 2016 ACHA and the addendum assessment. Note that AHIPs applications have a 60-day determination period by Heritage NSW, but additional time should be allowed for contingency. Overall, given that an ACHA is already prepared for the project and RAPs have been established, the timeframe for the entire AHIP process should be approximately 3–4 months.
- Any AHIP application will be subject to consideration of the section 90k factors set out in the *National Parks and Wildlife Act 1974*, and therefore must be receive approval by Heritage NSW.
- If after the AHIP application is lodged and approved, additional sites are identified that would be impacted by the project, additional ACHA addendum assessment(s) would be required. An AHIP variation application would be lodged to include any additional sites, impacts and impact areas to the existing AHIP.
- The AHMP will be revised to refer to any AHIP issued in relation to the project. The AHMP will be updated to be consistent with the conditions of any AHIP issued. All AHIPs will be attached to the AHMP as an appendix.

Any AHIP issued in conjunction with this AHMP should be consulted prior to enacting any management measures for identified Aboriginal objects. All proposed salvage measures must be completed by a qualified archaeologist(s) with participation of at least one RAP representative. All salvaged objects will be managed in accordance with Section 5.5.

Table 5.1 Proposed management of newly identified sites within the project area

Site type	Site within Stage 8 restoration area	Site within Stage 8 extraction area
Open stone artefact site	Apply active or passive protection measures as per Sections 5.1.2 and 5.1.3.	<p>For sites of low to moderate archaeological significance, surface collection will be employed prior to project impact as follows:</p> <p>The collection will be undertaken by qualified archaeologists and RAP representatives. The collection method will be as follows:</p> <ol style="list-style-type: none"> 1. The general vicinity of each site location will be inspected by the field team. Stone artefacts will be flagged on the ground and a photo taken of the flagged site. Each flagged artefact will be marked as a waypoint in the GPS. 2. All artefacts will be collected into snap lock plastic bags or similar, marked with the project name, site name, collection date and waypoint number. 3. All artefacts will be sorted and recorded post-fieldwork with respect to technological type, implement type, raw material, maximum block length and weight. 4. The collected artefacts will be incorporated into a salvage report detailing the results of the fieldwork, the artefacts recovered at each site and GIS figures showing the artefact locations. 5. The Aboriginal Heritage Information Management System (AHIMS) records will be updated with a site impact recording form for each collected site. <p>For sites of high archaeological significance, or with potential to be of high archaeological significance through the identification of significant PAD, as determined by the project archaeologist, test excavation may be employed to a methodology prepared in consultation with Menangle Sand and Soil and RAPs.</p> <p>Any salvage excavation program would require a report on the methods and outcomes of the excavation.</p>

Table 5.1 Proposed management of newly identified sites within the project area

Site type	Site within Stage 8 restoration area	Site within Stage 8 extraction area
Modified trees	Apply active or passive protection measures as per Sections 5.1.2 and 5.1.3.	<p>Note that Aboriginal tree scars may require verification by a qualified scar tree expert such as an arborist or Aboriculturalist if the scars are ambiguous to a degree that they cannot be determined by the project archaeologist. If a tree is assessed by an expert not to be an Aboriginal object, then RAPs and Heritage NSW will be notified and confirm that the tree is not an Aboriginal object in accordance with CoA B62 (a) to confirm that works may proceed in the area of the tree.</p> <p>If find is determined to be an Aboriginal scar tree that cannot be avoided, the following Aboriginal scar tree removal procedure will be followed:</p> <ul style="list-style-type: none"> • A suitably qualified person in scar tree management (eg archaeologist with scar tree specialisation, Arboriculturalist or arborist) will be engaged to determine a suitable removal method in consultation with RAPs. This may involve the requirement to saw the tree above the scar location allowing a suitable buffer from the scar feature. The process of removal will be photographed. • The removed tree and scar may be treated to preserve the scar to prevent its further deterioration. Any treatment option would be completed in consultation with RAPs, Menangle Sand and Soil and a suitably qualified curator. • The tree will be relocated to a nominated Aboriginal keeping place or other location as guided by RAPs (yet to be determined) appropriately displayed using suitable materials in consultation with Menangle Sand and Soil and RAPs. <p>The outcomes of the tree management activity will be documented in a short letter report including records of the original and new tree location. Note that long term management of any salvaged trees may require a Care Agreement as set out in Section 6.3.3.</p> <p>The AHIMS records will be updated with a site impact recording form for the site.</p>
Hearths	Apply active or passive protection measures as per Sections 5.1.2 and 5.1.3.	Archaeological excavation of the hearth will be employed and will involve taking suitable dating and soil samples if feasible as determined by the archaeologist.
Rockshelters	Apply active or passive protection measures as per Sections 5.1.2 and 5.1.3.	Apply active or passive protection measures as per Sections 5.1.2 and 5.1.3.
Grinding grooves or engravings	Apply active or passive protection measures as per Sections 5.1.2 and 5.1.3.	Apply active or passive protection measures as per Sections 5.1.2 and 5.1.3.
Other rarer site types not known to occur in the project boundary (eg stone arrangements, middens etc).	Apply active or passive protection measures as per Sections 5.1.2 and 5.1.3.	<p>As other site types have a very limited chance of being identified in the project boundary, no specific management methodology has been devised.</p> <p>If other site types not previously identified in the project boundary are identified, a salvage method must be prepared by the project archaeologist in consultation with RAPs and Heritage NSW. This may be established through an extraordinary meeting with RAPs or through letter correspondence with a reasonable timeframe for review.</p> <p>Any salvage activity to such sites may require additional assessment and approvals as dictated by Heritage NSW would require a report on the methods and results of the exercise.</p>

5.4.3 Discovery of Aboriginal ancestral remains

In the event that known or suspected human skeletal remains are encountered during the activity, the following procedure presented in Table 5.2.

Table 5.2 Procedure for the discovery of potential Aboriginal ancestral remains

Stage	Actions
1. Stop work and secure site	<ul style="list-style-type: none"> The immediate vicinity will be secured to protect the find and the find will be immediately reported to the work supervisor who will immediately advise the site supervisor or other nominated senior staff member. A no-go zone will be established around the immediate area of the site. Complete review of activities to enable compliance and continued operations.
2. Notification to authorities and stakeholders	<ul style="list-style-type: none"> The environmental manager or other nominated senior staff member will notify: <ul style="list-style-type: none"> Police and State Coroner on the same day as the find; Heritage NSW (1300 361 967) or Environment Line (131 555); Engage suitably qualified archaeologist or forensic anthropologist to assist Police in monitoring of skeletal material.
3. Determination of the find and further notification	<ul style="list-style-type: none"> If it is determined that the skeletal material is of ancestral Aboriginal remains, RAPs contacted and consultative arrangements will be made to discuss ongoing care of the remains. Engage project archaeologist to assist and/or facilitate management of the Aboriginal ancestral remains with RAPs and Menangle Sand and Soil. If the skeletal material is not human, resume work. Ensure determination of non-human material is provided by relevant experts (eg Coroner or Police) before resuming work. If the remains are historic but non-Aboriginal human remains, the NSW Heritage Council (or delegate of the Heritage Council) will be consulted to determine requirements in accordance with the NSW <i>Heritage Act 1977</i> and relevant guidelines. Further actions are likely to require adherence with the following NSW Heritage Council guidelines: <ul style="list-style-type: none"> <i>Conservation Management Documents: Guidelines on Conservation Management Plans and other Management Documents.</i> <i>Skeletal Remains; Guidelines for Management of Human Skeletal Remains.</i> If the remains are non-Aboriginal and non-historic human remains, coordinate Menangle Sand and Soil involvement with police. Works will not proceed until written approval is granted from relevant authorities.
4. Initial planning and reporting if it is determined that the remains are Aboriginal ancestral remains.	<ul style="list-style-type: none"> Aboriginal ancestral remains certificate to be submitted to the Police/Coroner to address the Coroners Act. In consultation with RAPs, Heritage NSW and archaeologist, establish investigation area and any additional protocols to be adhered to during further investigation. The investigation will aim to establish whether any other burials are within or likely to occur nearby. Suitable methods could include controlled and monitored hand or machine excavation and/or non-invasive techniques such as geophysical techniques. Engage an archaeologist to record the site and undertake significance and impact assessment of the burial site with RAPs and archaeologist. Site recordings must involve drawings and photography. Additional technical studies and samples may be taken with the consent of RAPs such as those for dating and biological information (eg age, sex and health of deceased). Record burial site on AHIMs register, noting any restricted access requirements requested by RAPs.

Table 5.2 Procedure for the discovery of potential Aboriginal ancestral remains

Stage	Actions
5. Engagement with construction and operation manager to determine whether disturbance of the burial site(s) can be avoided.	<ul style="list-style-type: none"> • If the Aboriginal ancestral remains cannot be avoided: <ul style="list-style-type: none"> – Consult with RAPs, Heritage NSW and project archaeologist to facilitate recovery and reburial protocols and actions. Approval for recovery methods must be obtained by relevant authorities prior to any further movement of the remains: – Recovery methods must include: <ul style="list-style-type: none"> ▪ Exhumation in a controlled archaeological method and in consultation with RAPs and placed into a secure, temperate controlled storage location until a final reburial site can be identified. ▪ Access to the secure storage location containing any human remains will be managed and facilitated by Menangle Sand and Soil in consultation with RAPs. ▪ RAPs will determine if further studies, media releases or other investigations are appropriate for the finds. ▪ Where required, Menangle Sand and Soil will help facilitate any culturally appropriate reburial or ceremonial methods. – Prepare report for Heritage NSW and RAPs on the outcome of relevant investigation, recovery and reburial outcomes. – Update AHMP. – Works will not recommence until written approval is received from relevant authorities. • If the Aboriginal ancestral remains can be avoided: <ul style="list-style-type: none"> – develop appropriate management and mitigation measures in consultation with RAPs, Heritage NSW and archaeologists; – prepare report for DPE, Heritage NSW and RAPs; – update AHMP; and – works will not recommence until written advice is provided from the project archaeologist that the remains are suitably protected and away from project impacts.

5.5 Management of salvaged objects

There are currently no Aboriginal objects that require salvage as part of the project. If stone artefacts are identified and require salvage in accordance with this plan and any other relevant permits, they will be reburied on Menangle Sand and Soil property in an area suitable for long term conservation and not be at risk of any foreseeable impacts. The proposed reburial location is shown on Figure 4.1.

The reburial activity would be guided by 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). Any reburial fieldwork would be undertaken by a qualified archaeologist so that it is recorded appropriately. RAPs who wish to be involved in the activity will also be requested to participate.

As no Aboriginal objects are currently proposed for salvage, a Care Agreement under the *NSW National Parks and Wildlife Act 1974* (NPW Act) for the transfer of Aboriginal objects to Aboriginal owners is not currently proposed. If Aboriginal objects in the project are identified and subsequently permitted for salvage, a Care Agreement may be pursued, subject to the nature of the find. The AHMP will be updated in the event of a Care Agreement application.

5.6 Monitoring and inspection

The project will develop in a staged process and therefore monitoring and inspection protocols will only be triggered when relevant project activities begin in the proximity of individual Aboriginal sites. The aims of monitoring and inspection will be to verify that the Aboriginal sites designated for avoidance and protection are managed appropriately and that no inadvertent impacts have occurred.

All sites that occur within the project area, with the addition of Bulli Site 40 (AHIMS #52-2-3720 – rockshelter with art), that are designated for avoidance and active protection will be subject to monitoring inspections. Monitoring inspections and baseline recording will be completed prior to ground disturbance occurring within 100 m of each respective site. Table 5.3 presents the monitoring requirements.

Table 5.3 Monitoring program for Aboriginal heritage

Aboriginal sites	Monitoring		
	Prior to extraction	During extraction	Post extraction
Rockshelters	Baseline monitoring to record the sites before mining and note any existing cracks and areas of vulnerability. Baseline recording – photographs, plan drawings.	N/A	Visual inspection and photography conducted by an archaeologist after extraction activities have continued past the site that allows safe access to sites for inspection.

In the event that impacts are observed for sites designated for avoidance and protection, Menangle Sand and Soil at the earliest opportunity will:

- investigate to determine if the impact is related to non-project factors or is a consequence of project activities;
- take all reasonable steps to ensure that the impact ceases and does not reoccur;
- consider all reasonable and feasible options for remediation (where relevant) in consultation with RAPs and Heritage NSW;
- submit a report to DPE and Heritage NSW describing those options and any preferred remediation measures or other course of action; and
- implement remediation measures subject to the conditions of this AHMP and any other relevant permits.

6 Compliance management

6.1 Training

6.1.1 Obligation to avoid harm

All employees, contractors, sub-contractors and visitors to the project have an obligation to avoid harming Aboriginal heritage unless engaged in an Aboriginal heritage management activity described in this plan.

The NPW Act defines “harm” to an object or place as any act or omission that:

- (a) destroys, defaces or damages the object or place, or
- (b) in relation to an object-moves the object from the land on which it had been situated, or
- (c) is specified by the regulations, or
- (d) causes or permits the object or place to be harmed in a manner referred to in paragraph (a), (b) or (c), but does not include any act or omission that:
 - (e) desecrates the object or place, or
 - (f) is trivial or negligible, or
 - (g) is excluded from this definition by the regulations.

6.1.2 Obligation to protect and implement management measures

Site personnel, contractors and subcontractors responsible for land management or construction have an obligation to protect Aboriginal heritage within their area or work responsibility. Protection means active recognition of known Aboriginal heritage and active measure to avoid Aboriginal heritage. This may include fencing, erosion control and modification of work plans to avoid impacts to Aboriginal heritage, as well as facilitating a process where work personnel are aware of the nearby heritage.

Site personnel, contractors and subcontractors also have the responsibility to ensure that appropriate management measures have been employed prior to, or in association with, their activities which impact Aboriginal sites.

6.1.3 Aboriginal heritage induction and permitting process

All employees, contractors, sub-contractors involved in ground-disturbing activities will undergo an Aboriginal cultural heritage induction. In addition, visitors to the project and general contractors not involved in ground-disturbing activities will be made aware of their obligation to avoid harm to Aboriginal heritage through an Aboriginal heritage component of the general site induction. Records of these inductions will be kept by Menangle Sand and Soil.

The following points will be conveyed through site induction material:

- Aboriginal sites have been identified in the Stage 8 restoration area;
- Aboriginal sites are of high significance to the Aboriginal community, are important to the wider community and must be treated with respect;

- Aboriginal sites are protected by law and that project approval includes conditions allowing impacts to certain specified Aboriginal sites in accordance with this plan;
- Aboriginal sites can be hard to recognise, therefore reference must be made to the Aboriginal heritage maps in this AHMP in order to clearly identify demarcated site boundaries;
- certain areas of the project area must be managed by an archaeologist and RAPs prior to ground disturbance activities;
- that there are new finds procedures which involve stopping work if suspected new Aboriginal sites or skeletal material is identified on-site; and
- sites such as rock shelters, engravings and grinding grooves have some potential to be uncovered during extraction activities – all personnel undertaking activities related to excavation in the extraction area will be provided with photographic examples of these site types and be reminded to stop work if these finds are uncovered.

6.2 Auditing

6.2.1 Implementation of this plan

Menangle Sand and Soil will implement this AHMP as approved by the Secretary. The individuals responsible for the implementation of the plan are provided in Table 6.1. The plan will be stored in Menangle Sand and Soil’s document control system; the latest version will be available electronically at all times. As the document owner, Menangle Sand and Soil is the contact point for this plan and its requirements and will provide guidance and training to any person that requires additional training regarding this plan.

Table 6.1 Roles and responsibilities for Aboriginal heritage management

Role	Responsibilities
Quarry Manager	<ul style="list-style-type: none"> • Ensure that the AHMP is implemented as approved by the Secretary. • Ensure the implementation of this plan is carried out appropriately during construction/operations. • Ensure adequate financial and personnel resources are made available for the implementation of this plan. • Manage the implementation of this plan during extraction and restoration.
Environmental Manager	<ul style="list-style-type: none"> • Primary contact with RAPs. • Oversee signage and fencing of areas containing artefacts in accordance with this plan. • Ensure the Aboriginal heritage management measures required to be undertaken prior to ground disturbance activities are conducted in accordance with the measures outlined in this plan. • Ensure signage and fencing of Aboriginal sites is maintained. • Ensure inclusion of Aboriginal heritage in work inductions through delivery or input to induction documents. • Distribute copies of this plan as required. • Engage and coordinate relevant specialist personnel to undertake management measures or additional assessment as specified in this plan. • Maintain records of Aboriginal consultation. • Ensure relevant reporting, data management and registration is conducted, maintained and updated.

Table 6.1 Roles and responsibilities for Aboriginal heritage management

Role	Responsibilities
	<ul style="list-style-type: none">• Arrange for a review of this plan in accordance with review cycles and conditions specified in this plan.

6.2.2 Measuring performance

Actions undertaken under the plan will be reported as part of required Independent Environmental Audits to DPE. Compliance with the plan will be measured by standard environmental auditing procedures undertaken at regular intervals. The audit will include an assessment of compliance with development consent conditions and will include auditing the following measures:

- protection of all nominated sites;
- inductions are taking place and include appropriate material; and
- reporting and managing any newly identified Aboriginal objects in accordance with this plan.

Menangle Sand and Soil may engage a heritage consultant to assist with reporting compliance as part of an Independent Environmental Audit. Any incidents and non-compliance notifications will follow requirements set out in Part D of the project Conditions of Consent as per the Environmental Management Strategy (EMS).

6.3 Reporting

6.3.1 Statutory reporting requirements

Notifications to Heritage NSW are required in relation to discovery, impact and care of Aboriginal objects under the NPW Act. This will be the responsibility of the Environmental Manager.

6.3.2 Discovery of Aboriginal objects

Under Section 89A of the NPW Act, it is a requirement that Heritage NSW is notified of the existence of Aboriginal objects as soon as practicable after they are first identified. This is done through the completion of the Heritage NSW Aboriginal Site Card which is submitted to the Registrar of AHIMS for inclusion on the Aboriginal site database. Information regarding AHIMS and site recording forms can be downloaded from Heritage NSW's website:

<http://www.environment.nsw.gov.au/licences/DECCAHIMSSiteRecordingForm.htm>.

6.3.3 Care agreements

Under s85A of the NPW Act, Aboriginal objects remain the property, and under the protection of, the Crown until formal transfer to a person or persons of a class prescribed by the regulations occurs. A Care Agreement is not currently proposed under this plan; however, may be pursued in the future if Aboriginal objects are identified to a level of significance that the RAPs wish to retain such objects.

Care Agreement application forms can be downloaded at:

<https://www.environment.nsw.gov.au/topics/aboriginal-cultural-heritage/protect-and-manage/care-agreements>.

6.3.4 Reporting impact to Aboriginal sites

An Aboriginal Site Impact Recording Form must be completed following impacts to AHIMS sites that are:

- a) a result of test excavation carried out in accordance with the *Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW*;
- b) authorised by an Aboriginal Heritage Impact Permit (AHIP) issued by Heritage NSW;
- c) undertaken for the purpose of complying with Secretary's environmental assessment requirements issued by DPE for:
 - i) state significant development (SSD),
 - ii) state significant infrastructure (SSI), or
 - iii) a major project, or
- d) authorised by a SSD/SSI/former Part 3A consent/approval under the EP&A Act.

Completed forms must be submitted to the AHIMS Registrar at:

www.environment.nsw.gov.au/contact/AHIMSRegistrar.htm.

Aboriginal Site Impact Recording Forms can be downloaded at:

<http://www.environment.nsw.gov.au/resources/cultureheritage/120558asirf.pdf>.

6.3.5 Requirements for further assessment

Ground disturbance proposed outside of the approved project area, will not occur without prior Aboriginal heritage assessment and other relevant legislative and internal approvals. Depending on the scope, nature and approval pathway of the proposed ground disturbance, the following may apply:

- If the proposed activity requires additional environmental assessment, such as a modification to the existing development consent, an Aboriginal heritage assessment will be completed in accordance with relevant assessment requirements as specified by DPE.
- If the proposed activity is permissible under existing development consent and relevant heritage approvals, an Aboriginal heritage assessment must be completed to a level generally consistent with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (DECCW 2010c). Any potential impacts to known or newly identified Aboriginal objects will be managed in accordance with the new finds procedures set out in Section 5.4.
- If the proposed activity requires a separate approval pathway not permissible as part of the existing development consent under the EP&A Act and relevant heritage approvals, then an Aboriginal heritage assessment must initially be completed to a level generally consistent with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (DECCW 2010c) and relevant subdocuments. If Aboriginal objects are likely to be impacted, an AHIP would need to be pursued under the NPW Act to allow harm to Aboriginal objects.

6.3.6 AHMP review

i Review cycle for this plan

This AHMP will be reviewed within three months of an approved modification for the project, and following any incident or independent audit where issues are found.

ii Making changes to this plan

Changes to the plan will be made in the following circumstances:

- where new Aboriginal sites are discovered, they must be added to the inventory in this AHMP within one month of the find;
- where approved modifications to the project introduce new impacts on Aboriginal heritage which are not generally covered by the AHMP;
- where approved changes to the project change or remove previously planned impacts on Aboriginal heritage where mitigation was proposed in the plan but is no longer required; and/or
- where other conditions or situations arise that require the updating of this plan.

iii Aboriginal consultation for AHMP review

Where material changes are made to the AHMP, a draft of the modified plan will be provided to RAPs for their review and comment (14 calendar day review period).

Matters raised during consultation which are specific to any proposed changes in the plan will be acknowledged and addressed in the modified plan. Further requirements for Aboriginal consultation are set out in Chapter 3.

6.3.7 Complaints

The community complaints protocol as set out in the EMS for the project will apply in regard to complaints from the Aboriginal community.

The environmental manager will keep a complaints register for all complaints.

References

EMM Consulting Pty Limited (EMM) 2016, *Menangle Quarry Extension, Aboriginal Cultural Heritage Assessment*, prepared for Benedict Industries.

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

- 2010b, *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*.
- 2010c, *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales*
- 2010d, *Code of Practice Archaeological Investigation of Aboriginal Objects in NSW*.

Abbreviations

Table 6.2 **Abbreviations**

Abbreviation	Full term
ACHA	Aboriginal cultural heritage assessment
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
AHMP	Aboriginal heritage management plan
EA	Environmental Assessment
EMM	EMM Consulting Pty Limited
DPE	NSW Department of Planning, Industry and Environment
IPC	Independent Planning Commission
LALC	Local Aboriginal Land Council
LGA	Local government area
RAP	Registered Aboriginal Party (for the project)
RTS	Response to submissions



Appendix A

Aboriginal site inventory



A.1 Site inventory

Table A.1 Site inventory

Site name	AHIMS	Site type	Height (m)	Depth (m)	Length (m)	Habitable area (PAD)	Disturbance to deposit, visibility	Aspect	Position	Depth of PAD (m)	Overall significance	Relationship to project area	Management measure
MQ1	52-2-4636	Rockshelter with PAD	2	2	4	1 x 2	Moderate, rock fall, leaf litter	East	Upper scarp	0.3	Low: Problematic shelter with limited floor space, difficult to access on a steep slope.	Within 20 m of Stage 8 extraction area Inside Stage 8 restoration area	Active protection
MQ2	52-2-4637	Rockshelter with PAD	2.5	4.5	4	3 x 2	Low, animal activity, sandy floor	East	Mid scarp	0.5	Moderate: Moderate PAD area with minor disturbance.	Within 20 m of Stage 8 extraction area Inside Stage 8 restoration area	Active protection
MQ3	52-2-4638	Rockshelter with PAD	8	4	10	0.5 x 5	Shallow yellow sand atop sandstone, sloping floor	East	Upper scarp	0.1	Low: Problematic shelter with limited floor space, very exposed due to narrow shelter with high roof height and difficult to access.	Within 20 m of Stage 8 extraction area Inside Stage 8 restoration area	Active protection
MQ4	52-2-4639	Rockshelter with PAD	2	4	3	2 x 1	Silty sand with low visibility, leaf cover	East	Mid scarp	0.3	Low: Limited floor area and low ceiling height, moderately accessible on moderately inclined slope.	Within 50 m of Stage 8 extraction area Inside Stage 8 restoration area	Active protection
MQ5	52-2-4636	Rockshelter with PAD	1.4	1.3	1.5	1 x 1	Low visibility, leaf litter	East	Upper scarp	0.2	Low: Limited floor area and low ceiling height, moderately accessible on moderately inclined slope.	Within 50 m of Stage 8 extraction area Inside Stage 8 restoration area	Active protection
Bulli Site 40	#52-2-3720	Rockshelter with art and PAD	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	However, presence of 7 art motifs and PAD indicates moderate to high archaeological significance.	30 m south-west of Stage 8 restoration area	



Appendix B

Aboriginal consultation



B.1 Consultation log (entire project)

Aboriginal Consultation Log - Menangle Quarry Extension**Stage 1 - Advisory Requests Sent**

Organisation	Contact type	Date Sent	Comment
Office of Environment and Heritage, Metropolitan division	Letter	16-May-16	response received 24/5/16. Extensive list provided.
The Registrar, Aboriginal Land Rights Act 1983	Letter	16-May-16	response received 19/6/16. No registered Aboriginal owners. Suggested contacting Tharawal LALC
National Native Title Tribunal	Letter	16-May-16	response received 27/5/16. ILUA overlap with Gundangurra
Native Title Services Corporation (NTSCORP)	Letter	16-May-16	response received 24/5/16. Will not provide names but will forward information to groups they know of.
Tharawal LALC	Letter	16-May-16	
Wollondilly Shire Council	Letter	16-May-16	response received 19/8/2016 via email identifying Cubbitch Barter Native Title Claimants Corp (Glenda Chalker) and Tharawal LALC (Denise Ezzy).
Greater Sydney Local Land Service	Letter	16-May-16	response received 19/5/16. recommends contacting OEH
Water NSW	Letter	16-May-16	response received 26/5/16. No additional information

Advertisement in local newspaper

Wollondilly Advertiser	Email	Published 25/5/16
------------------------	-------	-------------------

Aboriginal Group Invitations to register sent

Organisation	Contact type	Date	Comments
Tharawal LALC	letter	31/05/2016	
Cubbitch Barta	letter	31/05/2016	
Peter Falk Consultancy	letter	31/05/2016	
Kawul Cultural Services	letter	31/05/2016	
D'harawal Mens Aboriginal Corporation	letter	31/05/2016	
Walgalu	email	31/05/2016	
Thauaira	email	31/05/2016	
Dharug	email	31/05/2016	
Bilinga Cultural Heritage Technical Services	email	31/05/2016	
Gunyu Cultural Heritage Technical Services	email	31/05/2016	
Munyunga Cultural Heritage Technical Services	email	31/05/2016	
Murrumbul Cultural Heritage Technical Services	email	31/05/2016	
Wingikara Cultural Heritage Technical Services	email	31/05/2016	
Gulaga	email	31/05/2016	
Biamanga	email	31/05/2016	
Callendulla	email	31/05/2016	
Murramarang	email	31/05/2016	

Aboriginal Group Registration

Organisation	Contact type	Date	Comments
Cubbitch Barta	email	01-Jun-16	Glenda Chalker
Peter Falk Consultancy	email	14-Jun-16	Peter Falk
Peter Falk	email	14-Jun-16	Duncan Falk
Gulaga	email	15-Jun-16	Wendy Smith
Biamanga	email	15-Jun-16	Seli Storer
Callendulla	email	15-Jun-16	Corey Smith
Murramarang	email	15-Jun-16	Roxanne Smith
Goobah	email	15-Jun-16	Basil Smith

OEH & LALC notified of Registered Stakeholders

Organisation	Contact type	Date	Comments
OEH (Metro division)	email	4/07/2016	
Tharawal LALC	letter	4/07/2016	
Tharawal LALC	email	5/07/2016	PO box address provided by OEH different to website. Email sent to website email address

Stage1 - Presentation of methodology and project

Organisation	Contact type	Date Sent	Comments
Tharawal LALC	Email	20-Aug-16	(not formally registered but sent method)
Cubbitch Barta	Email	20-Aug-16	
Peter Falk Consultancy	Email	20-Aug-16	Response to method received on 1.09.2016. Also previous response about the project area on 14.06.2016
D'harawal Mens Aboriginal Corporation	Email	20-Aug-16	(had only expressed interest on phone)
Gulaga	Email	20-Aug-16	
Biamanga	Email	20-Aug-16	
Callendulla	Email	20-Aug-16	
Murramarang	Email	20-Aug-16	
Goobah	Email	20-Aug-16	

Stage 2 - Fieldwork details

Organisation	Contact type	Date Sent	Comments
Tharawal LALC	Email	14-Sep-16	
Cubbitch Barta	Email	14-Sep-16	

Peter Falk Consultancy	Email	14-Sep-16	
D'harawal Mens Aboriginal Corporation	Email	14-Sep-16	
Gulaga	Email	14-Sep-16	
Biamanga	Email	14-Sep-16	
Callendulla	Email	14-Sep-16	
Murramarang	Email	14-Sep-16	
Goobah	Email	14-Sep-16	
Consultation meeting 1 - 23 September 2016			
Organisation	Person present	Date Sent	Comments
Tharawal LALC	attend	23-Sep-16	
Cubbitch Barta	Glenda Chalker	23-Sep-16	
Peter Falk Consultancy	Duncan Falk	23-Sep-16	
D'harawal Mens Aboriginal Corporation	attend	23-Sep-16	
Gulaga	Wendy Smith	23-Sep-16	
Biamanga	attend	23-Sep-16	
Callendulla	Keeden Bell	23-Sep-16	
Murramarang	Jake Bell	23-Sep-16	
Goobah	Richard Detton	23-Sep-16	
Draft ACHA sent to RAPs _ 10 Nov 2016			
Organisation	email/letter	Date sent	
Tharawal LALC	email	10-Nov-16	Hightail link sent in email, follow up email/reminder sent 28/11/2016
Cubbitch Barta	email and letter	10-Nov-16	Response recieved 18 November 2016, reply letter sent 7/12/2016
Peter Falk Consultancy	email	10-Nov-16	Hightail link sent in email, follow up email/reminder sent 28/11/2016
Gulaga	email	10-Nov-16	Hightail link sent in email, follow up email/reminder sent 28/11/2016
Biamanga	email	10-Nov-16	Hightail link sent in email, follow up email/reminder sent 28/11/2016
Callendulla	email	10-Nov-16	Hightail link sent in email, follow up email/reminder sent 28/11/2016
Murramarang	email	10-Nov-16	Hightail link sent in email, follow up email/reminder sent 28/11/2016
Goobah	email	10-Nov-16	Hightail link sent in email, follow up email/reminder sent 28/11/2016
D'harawal Mens Aboriginal Corporation	email	11-Nov-16	Hightail link sent in email, follow up email/reminder sent 28/11/2016
Menangle AHMP - issue of notice of AHMP preparation			
Organisation	email/letter	Date sent	
Tharawal LALC	email	22-Oct-20	
Cubbitch Barta	email	22-Oct-20	
Peter Falk Consultancy	email	22-Oct-20	
Gulaga	email	22-Oct-20	
Biamanga	email	22-Oct-20	
Callendulla	email	22-Oct-20	
Murramarang	email	22-Oct-20	
Goobah	email	22-Oct-20	
D'harawal Mens Aboriginal Corporation	email	22-Oct-20	
Menangle AHMP - Draft AHMP			
Organisation	email/letter	Date sent	
Cubbitch Barta	email	11-Dec-20	Comment received 6 Jan 2021 requiring response. Response issued 20/02/2021
Peter Falk Consultancy	email	11-Dec-20	
Gulaga	email	11-Dec-20	
Biamanga	email	11-Dec-20	Comment received - supported AHMP
Callendulla	email	11-Dec-20	
Murramarang	email	11-Dec-20	Comment received - supported AHMP
Goobah	email	11-Dec-20	Comment received - supported AHMP
D'harawal Mens Aboriginal Corporation	email	11-Dec-20	

B.2 AHMP consultation correspondence

Ryan Desic

From: Ryan Desic
Sent: Thursday, 22 October 2020 1:19 PM
To: informationofficer@tharawal.com.au; reception@tharawal.com.au; kgchalker@bigpond.com; kanga26@live.com.au; eugoogleiser@hotmail.com; elwyn.brown@yahoo.com.au; gulagachts@gmail.com; biamangachts@gmail.com; cullendullachts@gmail.com; murramarangchts@gmail.com; goobahchts@gmail.com
Subject: Menangle Quarry Sand and Soil Quarry Extension Project: Notice of preparation of Aboriginal Heritage Management Plan

Dear Registered Party,

Thank you for your continued involvement in Aboriginal cultural heritage matters for the Menangle Sand and Soil Quarry Extension Project (the project) in Menangle NSW. The letter at the link below is to advise that EMM Consulting Pty Limited (EMM) has been engaged on behalf of Menangle Sand and Soil Pty Ltd (Menangle Sand and Soil) to prepare an Aboriginal heritage management plan (AHMP) for the project.

The letter seeks your input into the contents and preparation of the AHMP. We will also provide the draft AHMP to you for your review and comment. EMM will proceed to draft the AHMP which is estimated be issued to RAPs within the next month. RAPs will be provided with 28 days to review the AHMP and provide written feedback.

Please do not hesitate to contact me with any questions about the project and AHMP.


Please download a copy of the letter from this link: <https://spaces.hightail.com/receive/D7PJc8NkOQ>

Regards,

Ryan Desic

Associate Archaeologist – Heritage Team Leader
Bushfire, Ecology, Heritage and Spatial Solutions (BEHSS)



T 02 9493 9500
M 0411 329 712
D 02 9493 9541
 Connect with us

SYDNEY | Ground floor, 20 Chandos Street, St Leonards 2065



Please consider the environment before printing my email.

This email and any files transmitted with it are confidential and are only to be read or used by the intended recipient as it may contain confidential information. Confidentiality or privilege is not waived or lost by erroneous transmission. If you have received this email in error, or are not the intended recipient, please notify the sender immediately and delete this email from your computer. You must not disclose, distribute, copy or use the information herein if you are not the intended recipient.

22 October 2020

Re: Menangle Sand and Soil Quarry Extension Project: notice of preparation of Aboriginal heritage management plan

Dear Registered Aboriginal Party,

1 Introduction

Thank you for your continued involvement in Aboriginal cultural heritage matters for the Menangle Sand and Soil Quarry Extension Project (the project) in Menangle NSW. This letter is to advise that EMM Consulting Pty Limited (EMM) has been engaged on behalf of Menangle Sand and Soil Pty Ltd (Menangle Sand and Soil) to prepare an Aboriginal heritage management plan (AHMP) for the project.

2 Quarry overview

Menangle Sand and Soil Pty Ltd operates the Menangle Sand and Soil Quarry at 15 Menangle Road Menangle. Quarrying has been undertaken in the location for over 40 years by a number of operators and at varying rates of production. Extraction, processing and rehabilitation activities have been undertaken by Menangle Sand and Soil since 1978.

Current extractive activities were approved in 1989 (DA 85/2865) and have involved the construction and operation of the quarry in seven stages. Sand and soil has been extracted from Stages 1 to 2 and 4 to 6 and is currently being extracted from Stage 7. While previously approved, sand and soil will not be extracted from Stage 3.

In September 2020, the NSW Land and Environment Court approved 'Menangle Quarry Extension – Modification 1' (MOD1). This allows the extraction of sand and soil in a new area, the Stage 8 area, that is about 13 ha, and extends about 2 kilometres along the Nepean River south of the Stage 7 area. The extension will increase the life of the quarry by 15 years. The extracted material will be transported to the existing processing area where it will be stockpiled, processed and blended with materials imported to the site, prior to being dispatched from the quarry.

A description of the quarry, including MOD1, is provided in Appendix A. The Notice of Orders Made by the Land and Environment Court (the 'consent') is provided in Appendix B.

3 Assessment and approvals background

As part of the Environmental Assessment for the project, EMM prepared an Aboriginal cultural heritage assessment report (ACHA) for the project in December 2016. The ACHA included the outcomes of an Aboriginal consultation process, an archaeological investigation (survey and test excavation) and Aboriginal heritage impact assessment. The ACHA outlined management measures that are required to be detailed in an AHMP.

There has been some delay in developing the AHMP because the application was initially rejected by DPIE. However, Menangle Sand and Soil appealed the decision to the Land and Environment Court under Case number 2018/00342158, Case title Menangle Sand and Soil Pty Limited v Minister for Planning. On 10 September 2020 the Court made orders that the appeal was upheld and that the modification was approved. The Notice of Orders Made (the 'consent') is provided in Appendix B.

In accordance with Part B, Condition B62 (b) of the Determination, EMM on behalf of Menangle Sand and Soil, is preparing an AHMP in consultation with Heritage NSW and project Registered Aboriginal Parties (RAPs) The aims of this letter is to notify your organisation that the AHMP is being prepared and to gather upfront input and feedback about the management commitments outlined in the project ACHA. Further comments and feedback will be sought once the draft AHMP is prepared and issued to all RAPs.

4 Heritage assessment background

The preparation of the Aboriginal cultural heritage assessment (ACHA) for the modification application included:

- background research of the Stage 8 area's environmental, archaeological and ethno-historical context;
- Aboriginal consultation in accordance with the *Aboriginal Consultation Requirements for Proponents 21010* (DECCW 2010c);
- an archaeological survey, geoarchaeological survey and test excavation program; and
- an assessment of archaeological, socio-cultural and historical values (significance to the Aboriginal community); impacts of the project and management for the identified Aboriginal cultural heritage values using the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (DECCW 2010b).

The preparation of the ACHA included consulting seven Registered Aboriginal Parties (RAPs), including a consultation meeting at the quarry, RAP participation in the cultural heritage fieldwork and review of the draft ACHA report.

The ACHA identified that the project area includes three distinct landform types adjacent to the Nepean river, comprising a lower terrace, upper terrace and sandstone escarpment (scarp).

In summary, the assessment found:

- Six known (recorded) Aboriginal sites relevant to the project. This comprises one confirmed Aboriginal site (Bulli Site 40, AHIMS #52-2-3720 – rockshelter with art) that was recorded prior to the project ACHA, and five rockshelters with PAD (sites MQ1–MQ5) that were recorded during the project ACHA but have not been confirmed to feature Aboriginal objects (eg art, engravings or stone artefacts). The Aboriginal sites were identified and assessed through review of AHIMS data and targeted archaeological survey and all occur on the scarp landform outside of the Stage 8 extraction area.
- No Aboriginal objects were identified through targeted test excavation in the Stage 8 extraction area and the upper and lower terrace landforms are considered to have low archaeological potential for subsurface archaeological deposits, primarily because of their geomorphological depositional sequence (EMM 2016 p.63). No other Aboriginal sites or areas of PAD relevant to the project area were identified during the project ACHA.
- There is potential for further rockshelters to occur in the Stage 8 restoration area, but many areas were inaccessible due to thick vegetation cover.

- There is some residual potential for Aboriginal scar trees to occur within the Stage 8 extraction area as there are mature native trees that couldn't be accessed due to thick vegetation cover.
- The project will not impact the known Aboriginal rockshelter sites relevant to the project.
- The escarpment at the western boundary of the Stage 8 extraction area has been buried by sediment accumulation of the Nepean River. As such, there is a theoretical potential for buried rockshelter or other sandstone-type sites (eg engravings or grinding grooves) to be buried and potentially exposed by project works in the Stage 8 extraction area. This has been based on the geoarchaeological assessment completed for the ACHA.

These reports are available on the Major Projects website:

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8531.

5 Scope of AHMP

An AHMP will be prepared based on the management recommendations set out in the ACHA (2016) and will be updated to include any additional requirements as a result of the recently approved project design. The AHMP will involve the following main tasks:

- consultation with the Heritage NSW and RAPs about the details of the AHMP;
- preparation of a draft AHMP for RAP review, which will provide details of;
 - all Aboriginal sites identified during the archaeological investigation for the project;
 - measures to protect, monitor and manage Aboriginal objects;
 - measures to ensure ongoing consultation and involvement of project RAPs;
 - protocols for newly identified sites;
 - protocols for educating staff and contractors of their obligations relating to Aboriginal cultural heritage values through a site induction process;
 - protocols for suspected human skeletal materials;
 - protocols for the ongoing care of salvaged Aboriginal objects (if found and salvage is required); and
 - provisions for review and updates of the AHMP;
- preparation of a revised AHMP incorporating the outcomes of RAP consultation;
- preparation of a final draft for Heritage NSW review and comment; and
- preparation of the final AHMP, based on RAP, Heritage NSW, for issue to, and to be endorsed by, the Secretary of DPIE.

6 Next steps

This letter seeks your input into the contents and preparation of the AHMP. We will also provide the draft AHMP to you for your review and comment.

EMM will proceed to draft the AHMP which is estimated be issued to RAPs within the next month. RAPs will be provided with 28 days to review the AHMP and provide written feedback.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Ryan Desic', with a stylized flourish at the end.

Ryan Desic

Associate Archaeologist - Heritage Team Leader

rdesic@emmconsulting.com.au

Appendix A

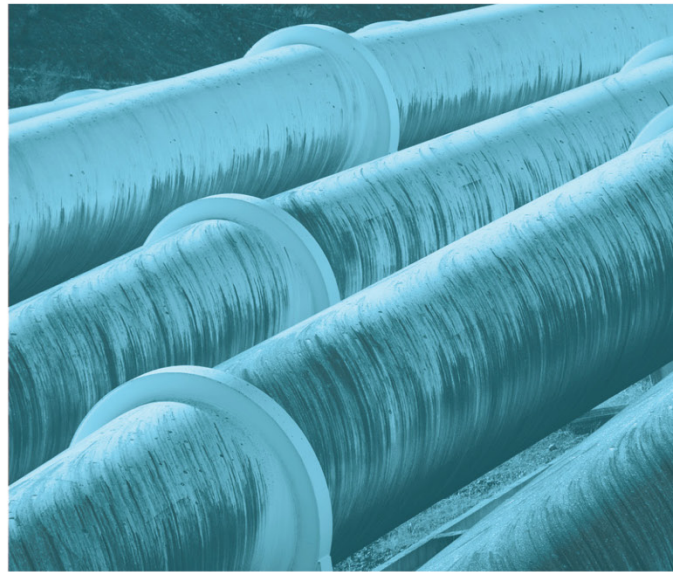
Project description



Land and Environment Court Proceedings 342158 of 2018

Applicant's Description of Amended Project

Menangle Sand & Soil Pty Limited v Minister for Planning
24 August 2020





Servicing projects throughout Australia and internationally

SYDNEY

Ground floor, 20 Chandos Street
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

ADELAIDE

Level 1, 70 Pirie Street
Adelaide SA 5000
T 08 8232 2253

MELBOURNE

Ground floor, 188 Normanby Road
Southbank VIC 3006
T 03 9993 1900

PERTH

Level 9, Suite 2, 109 St Georges Terrace
Perth WA 6000

CANBERRA

PO Box 9148
Deakin ACT 2600

Land and Environment Court Proceedings 342158 of 2018

Applicant's Description of Amended Project

Prepared for Menangle Sand & Soil Pty Limited v Minister for Planning
24 August 2020

EMM Sydney
Ground floor, 20 Chandos Street
St Leonards NSW 2065

T 02 9493 9500
E info@emmconsulting.com.au

www.emmconsulting.com.au

Land and Environment Court Proceedings 342158 of 2018

Applicant's Description of Amended Project

Report Number

J190166 RP#4

Menangle Sand & Soil Pty Limited v Minister for Planning

Date

24 August 2020

Version

v7 Final

Approved by



Dr P. Towler
Associate Director
24 August 2020

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

© Reproduction of this report for educational or other non-commercial purposes is authorised without prior written permission from EMM provided the source is fully acknowledged. Reproduction of this report for resale or other commercial purposes is prohibited without EMM's prior written permission.

Table of Contents

1	Introduction	1
2	Approved and proposed operations	2
2.1	Introduction	2
2.2	Resource	2
2.3	Quarrying	4
2.3.1	Quarry progression	4
2.3.2	Stage 8 area quarry design	9
2.3.3	Pre-extraction surveys	15
2.3.4	Vegetation clearing	15
2.3.5	Topsoil removal	15
2.3.6	Resource extraction	15
2.3.7	Dredging	16
2.4	Onsite material transport and processing	16
2.4.1	Stage 8 area material transport	16
2.4.2	Processing	16
2.4.3	Blending	16
2.4.4	Stockpiling	16
2.5	Access	17
2.5.1	Site access	17
2.5.2	Access to the Stage 8 area	17
2.5.3	Product dispatch	17
2.6	Quarry life	17
2.7	Biodiversity protection	17
2.8	Rehabilitation and closure	18
2.8.1	Progressive rehabilitation of the Stage 8 area	18
2.8.2	Final landform	18
2.9	Site infrastructure and services	19
2.9.1	Site buildings	19
2.9.2	Lighting	19

2.10	Hours of operation	19
2.11	Employment	24
3	Statement of commitments	25
3.1	Introduction	25
3.2	Summary of commitments	25
	References	30

Appendices

	Appendix A Development Application Land	A.1
--	---	-----

Tables

Table 2.1	Maximum area of each substage	4
Table 3.1	Summary of commitments	25
Table A.1	Development application land	A.2

Figures

Figure 2.1	Menangle Quarry Stages 1 to 8	3
Figure 2.2	Stage 8 overall staging plan	5
Figure 2.3	Stage 8 extraction and restoration areas – Stages 8A–8C	6
Figure 2.4	Stage 8 extraction and restoration areas – Stages 8D–8I	7
Figure 2.5	Stage 8 extraction and restoration areas – Stages 8I–8M	8
Figure 2.6	Quarry progression schematic	10
Figure 2.7	Quarry progression cross-section	11
Figure 2.8	Indicative cross-section	12
Figure 2.9	Indicative cross-section – close-up	13
Figure 2.10	Conceptual final landform 10 m setback – Northern extraction/rehabilitation area	20
Figure 2.11	Conceptual final landform 10 m setback – Southern extraction/rehabilitation area	21
Figure 2.12	Conceptual final landform 17.5 m setback – Northern extraction/rehabilitation area	22
Figure 2.13	Conceptual final landform 17.5 m setback – Southern extraction/rehabilitation area	23
Figure A.1	Development application land	A.3

1 Introduction

Menangle Sand and Soil Pty Ltd (Menangle Sand and Soil) seek a modification to Development Consent 85/2865 to extend the life of the quarry by 15 years while removing the need to re-establish quarrying activities, clear vegetation, and extract sand and soil from the approved Stage 3 area (the Menangle Sand and Soil Quarry Extension Project, the 'extension project'). It is proposed to forego approved land extraction (as well as dredging rights to another 200,000 tonnes) of 500,000 tonnes of sand and soil in the Stage 3 area and instead extend their current operations to extract sand and soil from an additional stage of the quarry (Stage 8). The Stage 8 area will extend approximately 2.8 km along the Nepean River on Company-controlled lands, within Lot 203//Deposited Plan 590247 on the eastern side of the Hume Highway. Approximately 760,000 tonnes of sand and soil will be extracted from the Stage 8 area land over about 15 years. Extraction will be in sequential substages so the active extraction area will be a small proportion of the total Stage 8 extraction area at any given time. No riverine extraction is proposed.

A modification application and accompanying environmental assessment (EA) report for the extension project was lodged in May 2017 and subsequently refused by the Department of Planning and Environment on 25 October 2018. The application is before the NSW Land and Environment Court (2018/342158).

An amended application was placed on public exhibition between 19 February 2020 and 4 March 2020. Amendments to the proposed modification are summarised in *NSW Land and Environment Court (2018/342158) Menangle Quarry - Project Amendments and Information Summary* (EMM [Towler] 2019a).

Given the application's history, the currently proposed modification is described in a range of documents.

This consolidated project description report provides a description of the currently approved quarry, based on Chapter 2 of the *Menangle Quarry Extension Environmental Assessment* (EA) (EMM 2017a), and the currently proposed modification (as amended) as described in Chapter 3 of the EA and subsequently amended in:

- *Supplementary Biodiversity Assessment* (EMM [Ward] 2019b);
- *Menangle Quarry - Amended Extraction Area and Setback* (EMM [Towler] 2019c);
- *Restoration Area Weed Strategy* (EMM [Grant] 2019d);
- *Groundwater Management* (EMM [Webb] 2019e); and
- *Flood Mitigation* (EMM [Towler] 2019f).

No modification amendments were proposed in the *Menangle Quarry Extension Response to Submissions* (RTS) (EMM 2017b).

The allotments subject to the development application modification, 'the site', are provided in Appendix A.

This consolidated project description report outlines the current proposal incorporating all of the changes to the project made since the Refusal and presents an updated statement of commitments.

2 Approved and proposed operations

2.1 Introduction

The extension project will increase the quarry life by 15 years (to 2035) by extracting the sand and soil resource in the Stage 8 area. The Stage 8 area extends approximately 2.8 km upstream of the currently active Stage 7 area. The project will require installation and operation of a conveyor between the existing processing area and the Stage 8 area. Menangle Sand and Soil will relinquish the approved extraction of resource (as well as its perpetual right to the resource located on the Elizabeth Macarthur Agricultural Institute land) from the approved Stage 3 area as part of the extension project.

The layout of the approved and proposed quarry is presented in Figure 2.1.

As well as the extraction areas, key components of the quarry include:

- an existing wheel wash and weighbridge;
- an existing site office and amenity building;
- an existing workshop west of the site office;
- existing fuel supply tanks north of the storage shed;
- existing sand and soils storage and processing area; and
- other existing minor infrastructure.

These components will be used to support activities in the Stage 8 area which will also include:

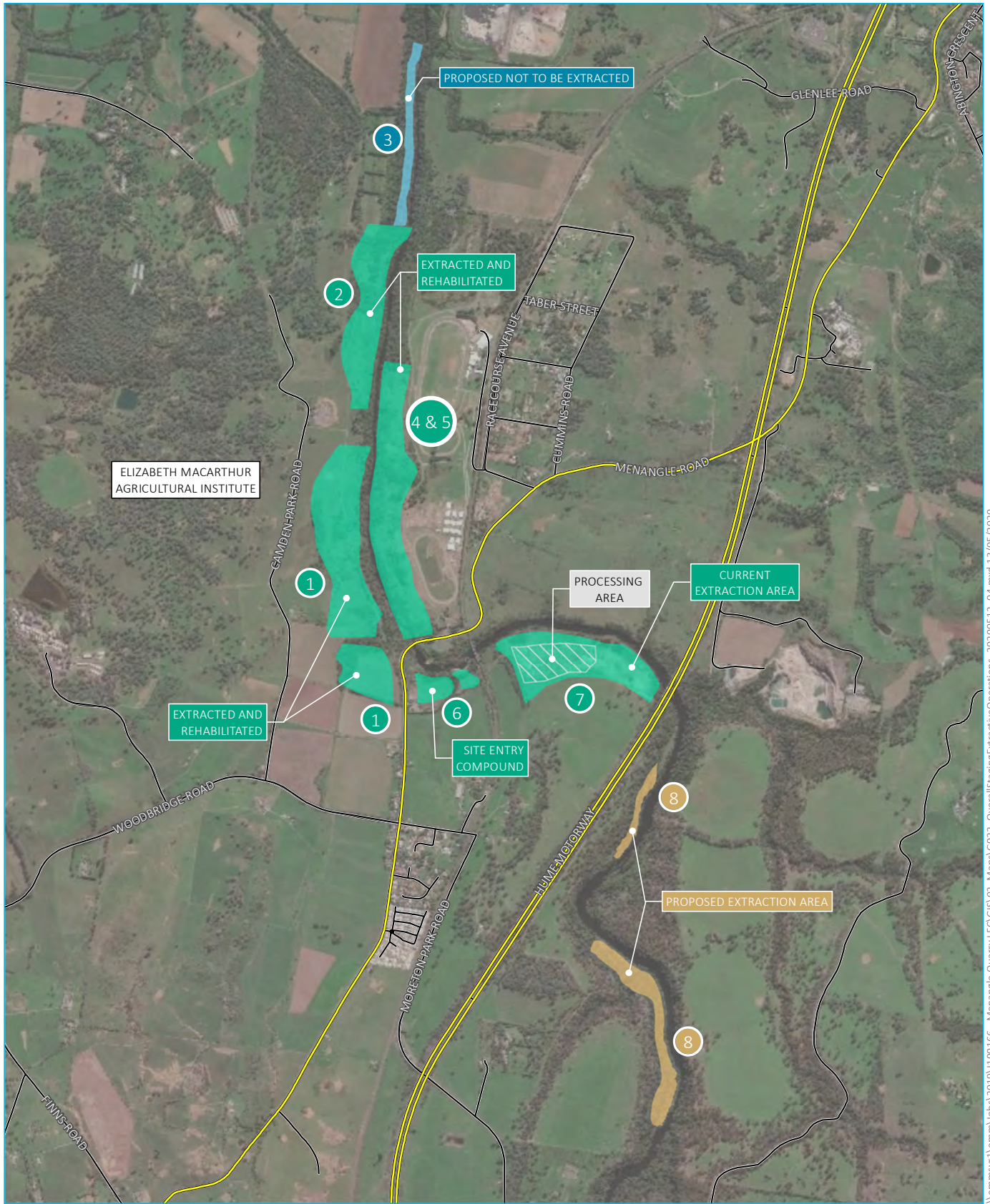
- extraction in the Stage 8 extraction area followed by rehabilitation;
- restoration of areas adjacent to the extraction areas;
- a conveyor; and
- a haul road.

These are described below.

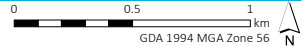
2.2 Resource

The total resource in the 1989-approved quarry is approximately 7.7 million tonnes, made up of approximately 5.9 million tonnes of soil and 1.8 million tonnes of sand. The approved extraction area is approximately 123 ha. An extraction rate of up to 350,000–400,000 tonnes per annum (tpa) of soil and sand is approved. To date, the resource has been extracted in all but the Stage 3 (approximately 300,000 tonnes soil and 400,000 tonnes sand) and the remaining part of the of Stage 7 area.

It is proposed to extract 760,000 tonnes of sand and soil from the Stage 8 area at a rate of no more than 150,000 tpa.



Source: EMM (2020); DFSI (2017); GA (2011)



- KEY**
- Main road
 - Local road
 - Existing processing area (to be retained)
 - Extractive operations (approved)
 - Extractive operations (approved but not extracted)
 - Stage 8 - extraction/rehabilitation area

Menangle Quarry Stages 1 to 8

Menangle Quarry Extension
Figure 2.1



\\emmsvr1\emms\jobs\2019\1190166 - Menangle Quarry\EC\GIS\02_Maps\G022_Overall\Staging\ExtractiveOperations_202.00512_04.mxd 13/05/2020

It is proposed to extract sand and soil from the Stage 8 extraction area (Figure 2.2) which has a total area of 13.22 ha.

Given that the width of horizontal setback area (see Section 2.3.2i) is variable and to ensure that any biodiversity impacts are fully compensated for, the 'extraction area' is defined as including the horizontal setback area, although extraction will not occur within this setback. This also reflects the previous intent to grade parts of the horizontal setback area where there are no trees. However, it is now proposed to leave the entire horizontal setback area undisturbed, save for hand weeding of the extensive existing noxious weeds.

The 'active extraction area' is the area where the overlying vegetation will be cleared (removing extensive understory weeds and mature native trees) and the sand and soil resource extracted.

2.3 Quarrying

2.3.1 Quarry progression

Historically, quarrying has progressed from south to north (Stages 1–2) and from west to east (Stages 4–7). Quarrying activities in the Stage 7 area are progressing from west to east. Extraction in the Stage 8 area will occur in sub-stages such that only a small portion of the overall Stage 8 area will be the active excavation area at any one time. Extraction will progressively move upstream in thirteen sub-stages, with each sub-stage each covering about 1 ha (Figures 2.2 to 2.4). Each of these sub-stages will be a basic operating cell and will take approximately 1 year to complete, depending on demand for product. Each sub-stage will be progressively rehabilitated using similar methods to those as implemented in the Stage 1–2 and Stage 4–5 areas but with a more intensively managed native planting regime implemented.

The maximum area of each substage is provided in Table 2.1.

Table 2.1 Maximum area of each substage

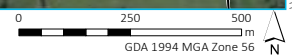
Substage	Area (ha)
8a	0.93
8b	0.93
8c	0.69
8d	1.07
8e	1.07
8f	1.07
8g	1.07
8h	1.07
8i	1.07
8j	1.07
8k	1.07
8l	1.07
8m	1.07
Total	13.25



Source: EMM (2019); DFSI (2017); GA (2011)

KEY

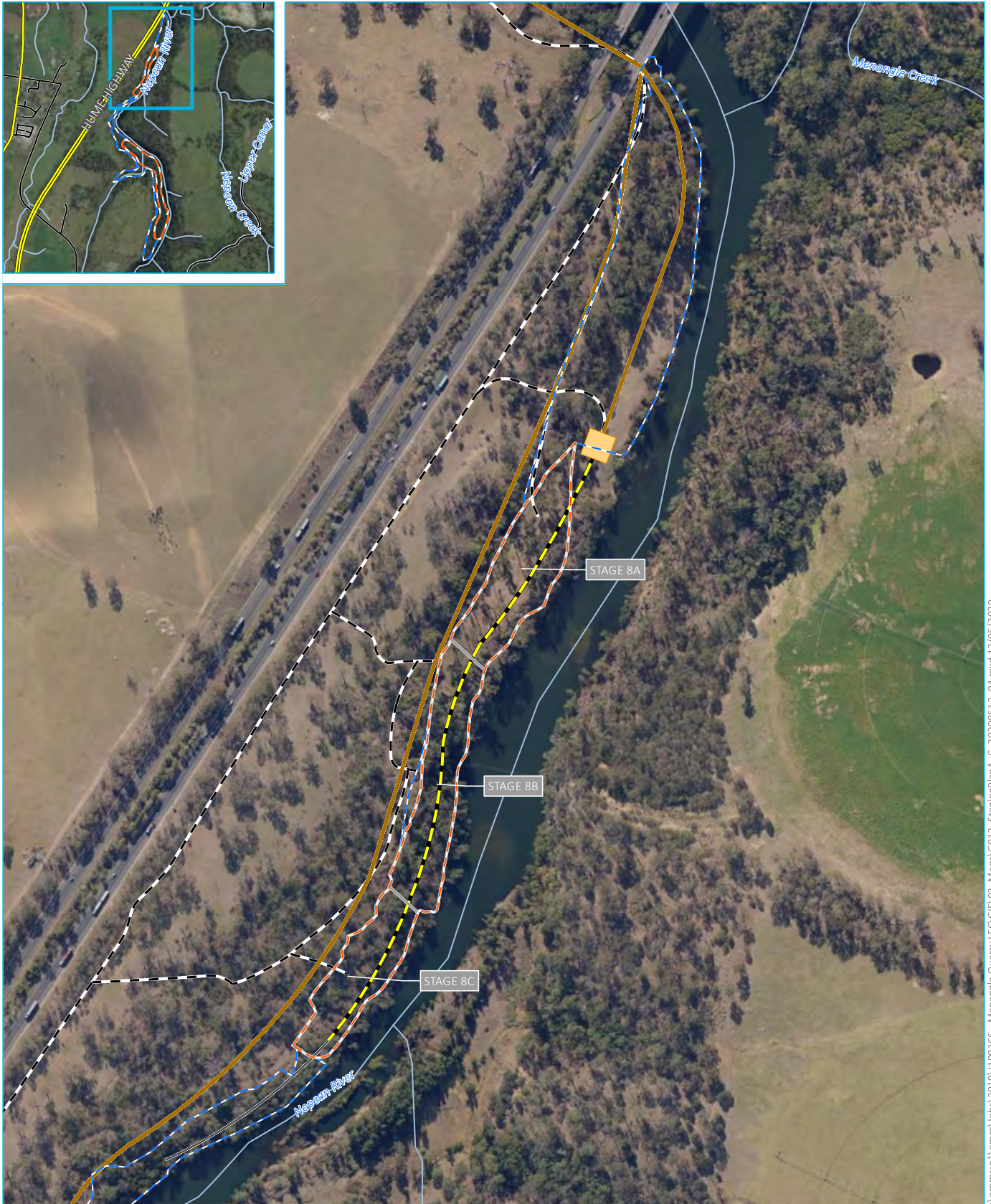
- Processing area (to be retained)
- Stage 7 - current extractive operations
- Stage 8 - extraction/rehabilitation area
- Stage 8 - restoration area (no extraction)
- Main road
- Local road
- Watercourse/drainage line



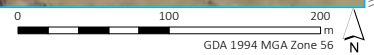
Overall staging plan

Menangle Quarry Extension
Figure 2.2

\\vemmsvr1\vermm\jobs\2019\190166 - Menangle Quarry\EC\GIS\02_Maps\G011_OverallStagingPlan_20200512_07.mxd 12/05/2020



Source: EMM (2019); DFSI (2017); GA (2011)



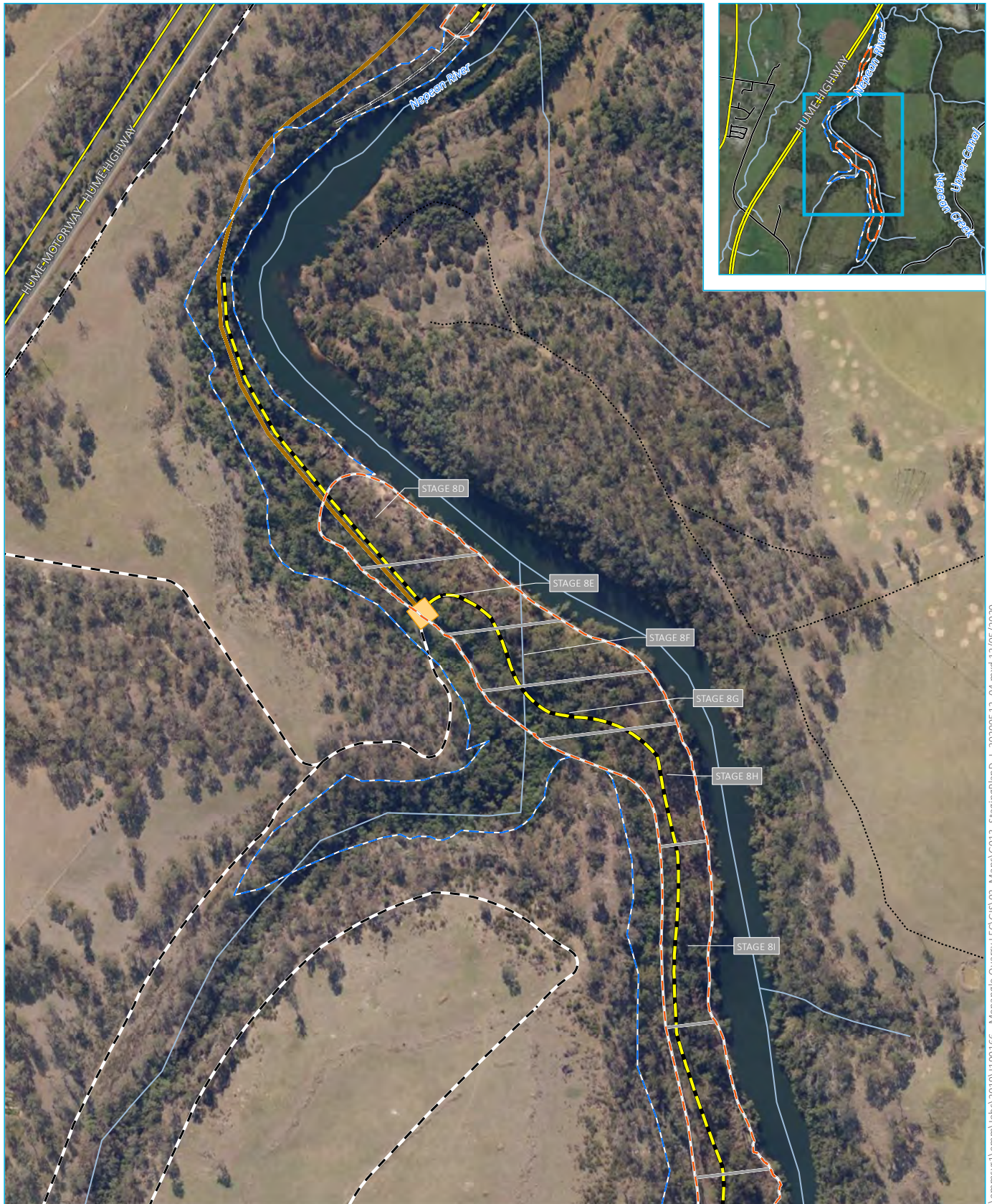
KEY

- Stage 8 - extraction/rehabilitation area
- Stage 8 - restoration area (no extraction) boundary
- Substage boundary
- Conveyor head
- Indicative conveyer location
- Haul road
- Access road
- Existing access track
- Watercourse/drainage line

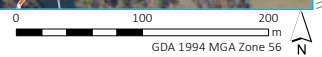
Stage 8 Extraction and restoration areas Stage 8A to 8C

Menangle Quarry Extension
Figure 2.3

\\emmsvr1\emms\jobs\2019\190166 - Menangle Quarry\EC\GIS\02_Maps\G012_StagingPlanA_C_20200512_04.mxd:12/05/2020



Source: EMM (2019); DFSI (2017); GA (2011)



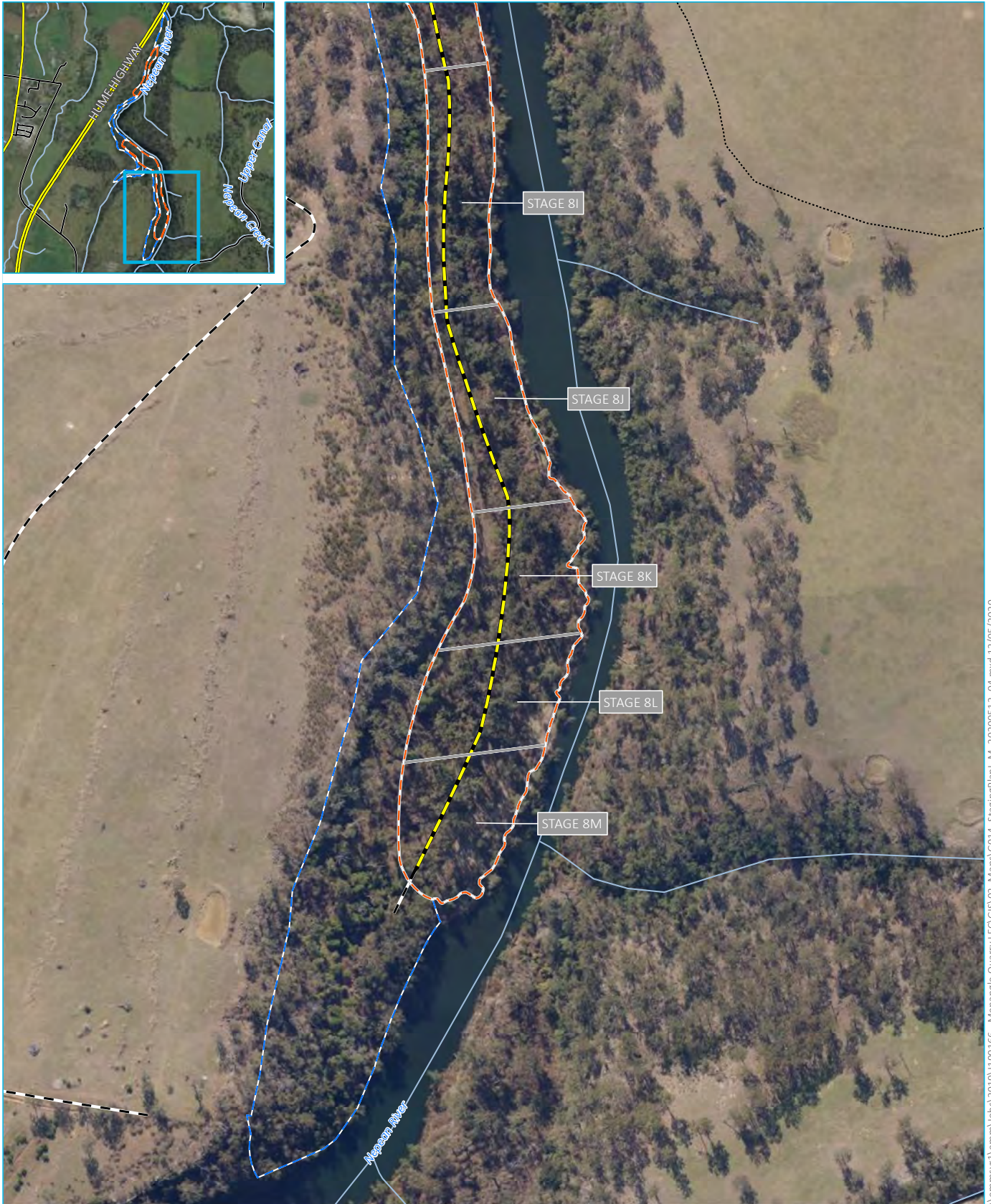
KEY

- Stage 8 - extraction/rehabilitation area
- Stage 8 - restoration area (no extraction) boundary
- Substage boundary
- Conveyor head
- Indicative conveyor location
- Haul road
- Access road
- Existing access track
- Main road
- Vehicular track
- Watercourse/drainage line

Stage 8 extraction and restoration areas – Stages 8D–8I

Menangle Quarry Extension
Figure 2.4

\\emmsvr1\emms\jobs\2019\1190166 - Menangle Quarry\ECGIS\02_Maps\G013_StagingPlanD_20200512_04.mxd 12/05/2020



Source: EMM (2019); DFSI (2017); GA (2011)

KEY

- Stage 8 - extraction/rehabilitation area
- Stage 8 - restoration area (no extraction) boundary
- Substage boundary
- Haul road
- Existing access track
- Local road
- Vehicular track
- Watercourse/drainage line

Stage 8 extraction and restoration areas – Stages 8I–8M

Menangle Quarry Extension
Figure 2.5

\\vemmsvr1\vermm\obs\2019\190166 - Menangle Quarry\EC\GIS\02_Maps\G014_StagingPlan1_M_20200512_04.mxd:12/05/2020

2.3.2 Stage 8 area quarry design

The Stage 8 quarry design is presented in Chapter 3 of the EA. Subsequently, the design has been amended to incorporate changes made since the Refusal. The amended proposed quarry design is summarised below.

Schematics showing the quarry progression in plan-view and in cross-section are presented in Figure 2.6 and Figure 2.7 respectively. An indicative cross-section perpendicular to the bank is presented in Figure 2.8 and Figure 2.9.

i Lower riverbank and horizontal setback retention

The level of the Nepean River adjacent to the Stage 8 area is controlled by the downstream Menangle Weir so as to be about 61 mAHD during normal low flow.

During extraction of the resource from the previous quarry stages, the lower riverbank was retained and a horizontal setback from a contour approximately 3 m above the normal river level was provided. For example, in the Stage 7 area, the lower riverbank (below 64 mAHD) was retained and a horizontal setback of 10 m from the 64 mAHD contour on the natural riverbank (ie 3 m above the normal level of the Nepean River) was provided.

A similar setback was proposed for the Stage 8 area. However, the proposed setback method has since been amended to protect all native trees in the 10-m wide horizontal setback area as follows:

- The lower riverbank will be retained below the 64 mAHD contour and remain untouched (except for hand removal of weeds, felling of non-native trees leaving the roots in place, and very selective herbicide application).
- The riverbank will also be retained in a horizontal setback that extends at least 10 m (measured horizontally) inland from the 64 mAHD contour up the bank (referred to as the '10-m-wide horizontal setback area')¹.
- Where there are native trees² within the 10-m-wide horizontal setback area, the width of the setback will be increased so that edge of the setback area/start of extraction area is at least 7.5 m (measured horizontally) from the trunk of these trees.

Therefore, the active extraction area will be separated from the river by the lower riverbank (ie between 61 mAHD and 64 mAHD) and additionally by the horizontal setback that will be between 10 and 17.5 m wide. The undisturbed bank (ie the combined lower riverbank and horizontal setback) will vary in height but will be at least 3 m above the low-flow river level where the bank slope is shallow but will be higher where the bank slope is steeper.

¹ It was previously proposed to grade the horizontal setback to a slope of 1:50 where there are no native trees within the horizontal setback area. This is no longer proposed and the existing landform within the horizontal setback area will be retained, including where there are no trees.

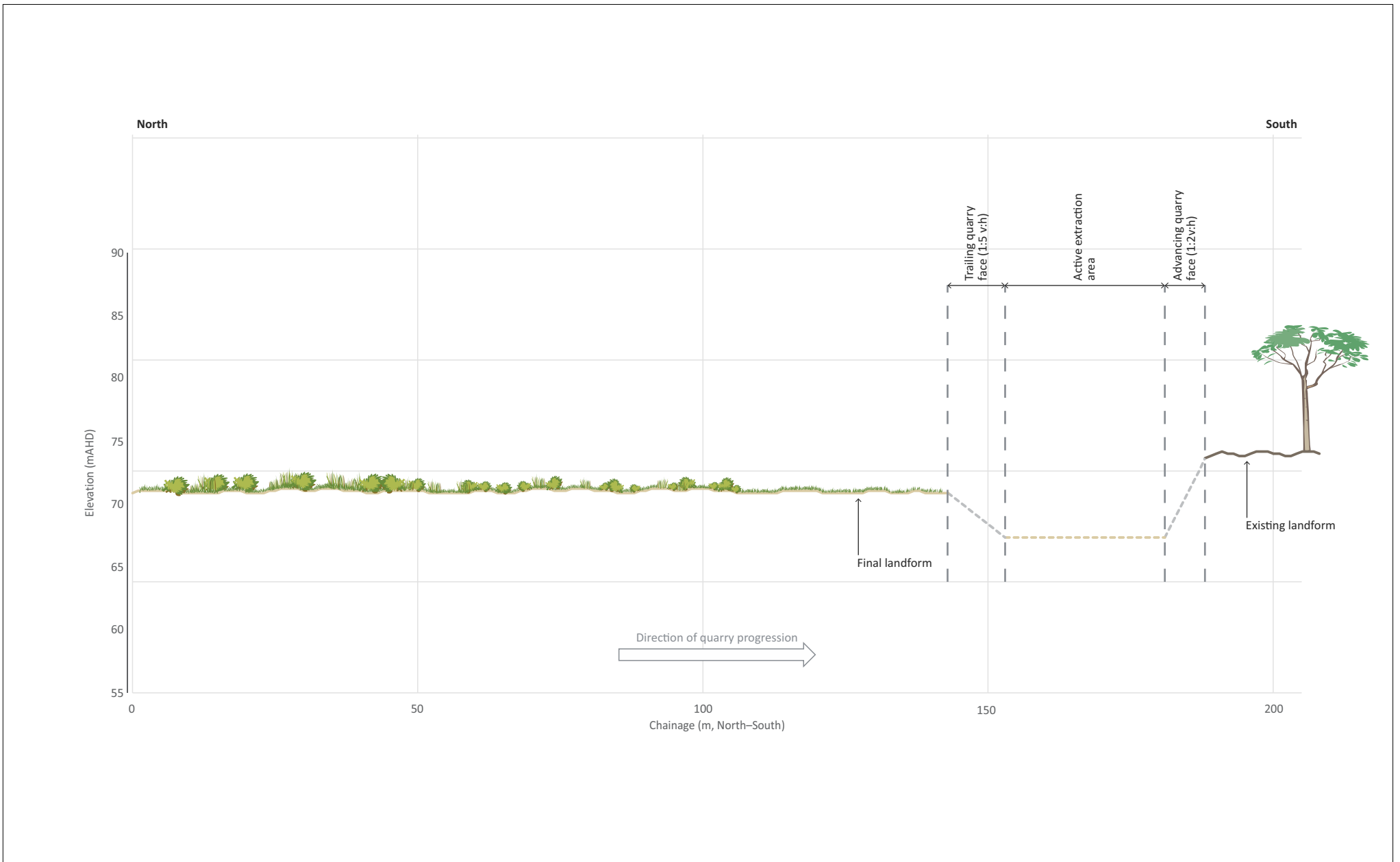
² Native trees with a trunk diameter of >0.1 m diameter at breast height (DBH).

KEY

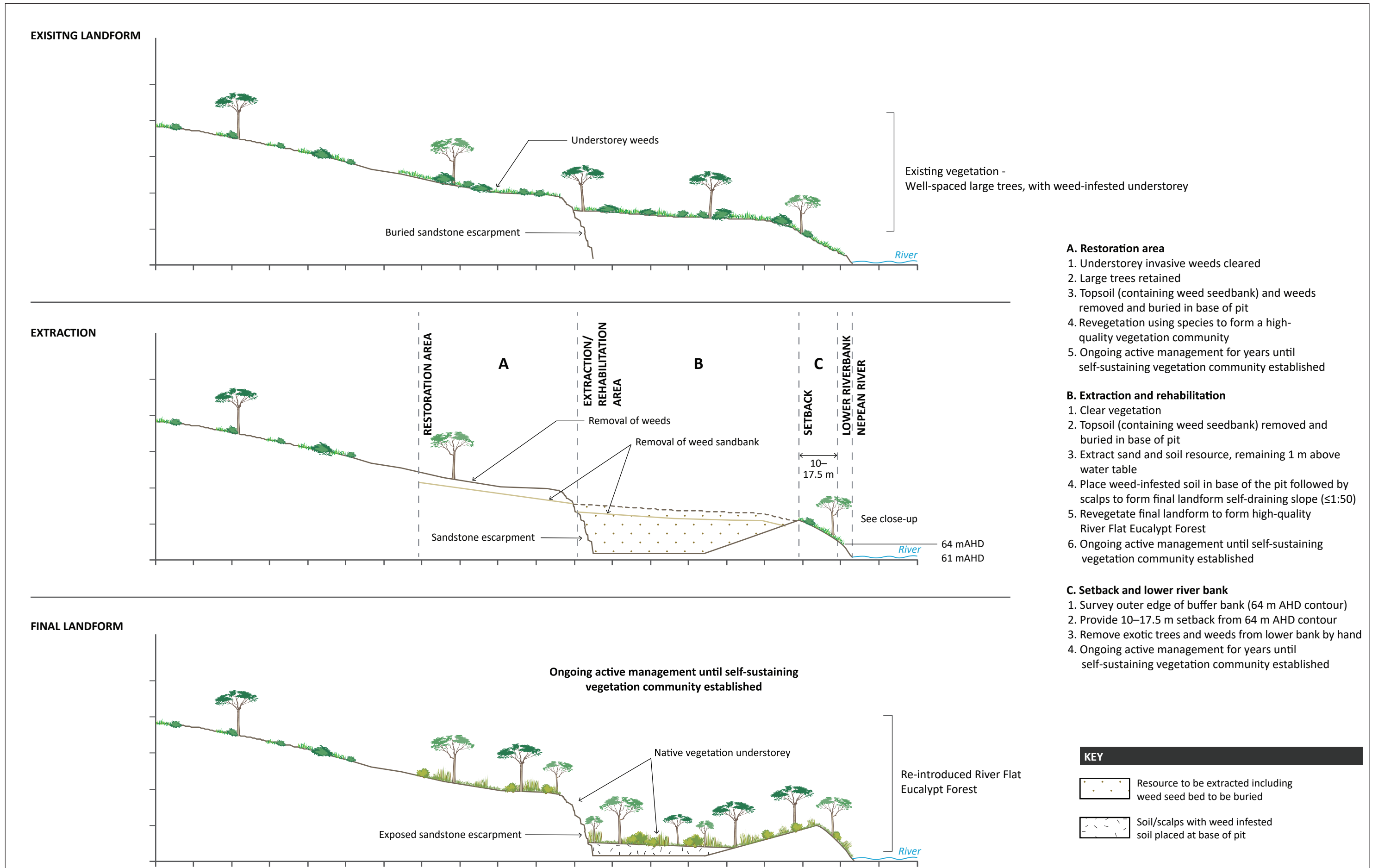
- ~64 mAHD Typical spot height
- 64 mAHD contour
- Downhill slope (vertical:horizontal)
- Batter
- Lower riverbank
- Setback
- Cross-section location



Quarry progression schematic
 Menangle Quarry Extension
 Figure 2.6



Quarry progression cross-section
 Menangle Quarry Extension
 Figure 2.7



A. Restoration area

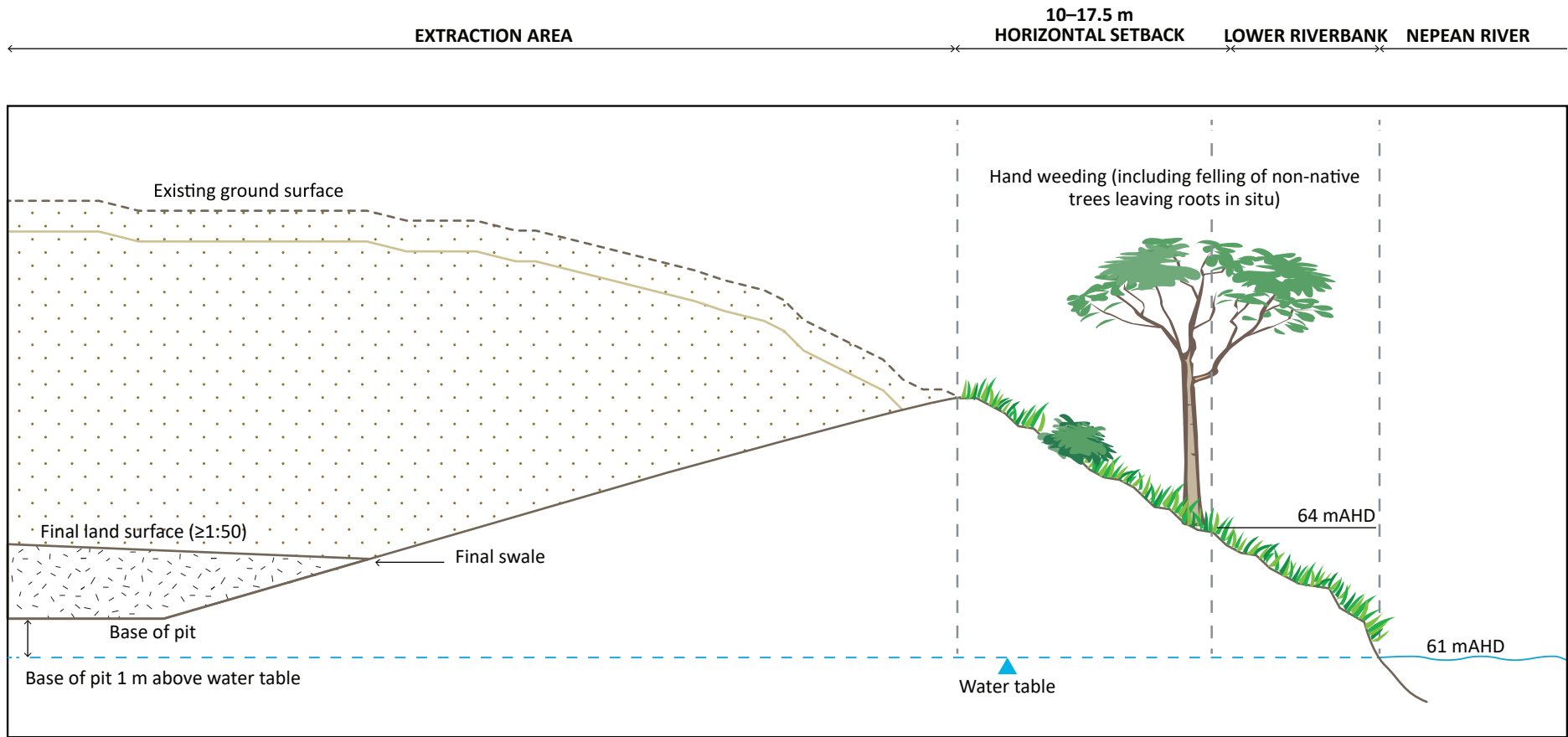
1. Understorey invasive weeds cleared
2. Large trees retained
3. Topsoil (containing weed seedbank) and weeds removed and buried in base of pit
4. Revegetation using species to form a high-quality vegetation community
5. Ongoing active management for years until self-sustaining vegetation community established



B. Extraction and rehabilitation

1. Clear vegetation
2. Topsoil (containing weed seedbank) removed and buried in base of pit
3. Extract sand and soil resource, remaining 1 m above water table
4. Place weed-infested soil in base of the pit followed by scalps to form final landform self-draining slope ($\leq 1:50$)
5. Revegetate final landform to form high-quality River Flat Eucalypt Forest
6. Ongoing active management until self-sustaining vegetation community established

C. Setback and lower river bank

1. Survey outer edge of buffer bank (64 m AHD contour)
2. Provide 10–17.5 m setback from 64 m AHD contour
3. Remove exotic trees and weeds from lower bank by hand
4. Ongoing active management for years until self-sustaining vegetation community established



- KEY**
-  Extracted sand and soil (including the surface weed bank to be buried)
 -  Soil/scalps, with weed-infested soil placed at the base of the pit

Indicative cross-section – close-up
 Menangle Quarry Extension
 Figure 2.9

ii Riverside batter

The riverside batter will be inland of the horizontal setback area (Figure 2.6).

It is proposed that:

- a temporary riverside batter with a maximum slope of 1:1 m (vertical: horizontal)³, will be used during sand and soil extraction – this will allow the efficient extraction of the resource;
- following extraction of the resource above this batter, the batter will be then built up with suitable site material to give a permanent slope of 1:5 – this will provide additional assurance that the bank will be stable if the active extraction area is flooded during extraction;
- the maximum length of the riverside batter that has a slope between 1:1 and 1:5 will be restricted to 30-m long so that it can be returned to a 1:5 batter within 12 hours if flooding is predicted;
- regardless of the amount of material required, the maximum length of the riverside batter that has a slope between 1:1 and 1:5 will be restricted to 30 m, measured parallel along the river;
- in the final landform, the riverside batter will have a permanent slope of 1:5 – this will provide additional assurance that the bank will be stable in the long term; and
- if over the life of the quarry, activities temporarily cease in the extraction area such that the excavator is relocated from the Stage 8 area, the riverside batter will be always left as a 1:5 batter.

iii Advancing quarry face

The quarry will progressively advance upstream at an average rate of about 150 m/year. The advancing quarry face will face downstream.

During large floods, river water may overtop the lower riverbank and horizontal setback area and flow into the active extraction area or may overtop the riverbank upstream of the active extraction area and flow along the bank to enter the active extraction area over the advancing face. A maximum batter angle of 1:2 will be applied to the advancing face so as to minimise any scour occurring as the water initially flows down the batter, until the water level in the extraction area is at the same level as the river.

iv Trailing quarry face

The trailing quarry face, between the active extraction area and backfilled extracted area, will face upstream.

A maximum landward batter angle of 1:5 is proposed for this face as it will face upstream in a flood. As for the riverside batter, this will mitigate the scour risk.

v Landward batter

The landward, or inland, batter is on the side of the extraction area furthest from the river (Figure 2.6).

A maximum landward batter angle of 1:1 is proposed as it will be exposed to far lower flood current speeds and peak shear stress than the riverside batter. There may be a steeper angle on the landward side of the extraction area where it is formed by the natural sandstone rock escarpment, which in places, may be vertical.

³ All slopes in this report are expressed as vertical:horizontal.

vi Base of the extraction area

Bores will be installed in the base of the active extraction area prior to the commencement of extraction in each successive substage and the water level will be recorded daily during active operations. The resource will be extracted in a manner that ensures that the base of the extraction area is always at least 1 m above alluvial water table resulting from the normal low flow water level in the Nepean River.

2.3.3 Pre-extraction surveys

Prior to any extraction occurring in each substage area, a qualified surveyor will:

- mark the boundary of the extraction area closest to the river as defined by the 64 m AHD contour;
- mark the extent of the 10-m-wide horizontal setback area;
- mark all living native trees with their trunk within the 10-m-wide horizontal setback area;
- place a peg 7.5 m horizontally landward of each tree within the 10-m-wide horizontal setback area – marking the extent to which the existing bank will be retained, ie forming the 10-m to 17.5-m-wide horizontal setback area;
- mark all other boundaries of the extraction area such that the area of each substage does not exceed the area in Table 2.1; and
- mark the boundaries of the adjacent restoration (no resource extraction) area.

2.3.4 Vegetation clearing

Vegetation will be cleared in campaigns ahead of sand and soil extraction. The area cleared at any one time will be minimised but will provide sufficient area to allow safe operations in the extraction area (allowing for the height of standing trees). The maximum extent of the cleared, but un-rehabilitated, extraction area will be 1 ha, but it is expected that a smaller portion will actually be cleared at any one time.

The timber will be stored onsite, prior to being periodically milled onsite using a portable mill. The milled timber will be used for fencing and other construction in the local area. Through a related entity, Menangle Sand and Soil control about 600 hectares in the local area where this milled timber will be used.

2.3.5 Topsoil removal

Topsoil will be stripped to a depth of approximately 0.2–0.3 m. Given that the topsoil in the Stage 8 area contains the seedbank for the noxious weeds infesting the area, this weed-infested material will be placed in the bottom of the preceding extraction area, following resource extraction, and will be covered by material returned as part of creating the final landform (see Section 2.8.1). It is important to bury these weed-infested soils deeply to prevent weed re-emergence.

2.3.6 Resource extraction

The sand and soil resource in the Stage 8 area will be extracted using an excavator and off-road haul truck. It will only be extracted to within 1 m above the water table (see Section 2.3.1). The excavator will load the haul truck, which will then transport the sand and soil to the conveyor head (see Section 2.4.1).

2.3.7 Dredging

Historically dredging has been used to extract sand from the Nepean River and is permitted in the existing Consent. Dredging is not proposed as part of the extension project (Stage 8).

2.4 Onsite material transport and processing

2.4.1 Stage 8 area material transport

Proposed Stage 8 works include the progressive construction of a haul road within the proposed Stage 8 area (see Figures 2.3 to 2.5). This haul road will follow existing cleared tracks.

An off-road haul truck will be used to transport excavated sand and soil from the active extraction area to the start of the conveyor, where it will be tipped.

At the conveyor head, sand and soil will be loaded into a self-powered screen which will remove the oversized material (>4 mm scalps). These scalps will be hauled back to the open excavation for use in rehabilitation. The screen will discharge sand and soil onto a conveyor.

The conveyor will be progressively extended south as the extraction moves south (see Figures 2.3 to 2.5). The conveyor will be a temporary structure (approximately 1.5-m high and 1-m wide) that will be removed upon completion of the project.

2.4.2 Processing

Mobile screens within the processing area are used to remove roots and coarse material (>4 mm) 'scalps'. The mobile stacker attached to the screen discharges screened soil into a stockpile for sale or blending. Some material is further screened to create specific blended soil products using mobile screening plants and a washing plant.

The wastes from the washing plant consist of organics such as pebbles, roots and fines (very fine sand, silt, and clay particles) in water. These wet fines are gravity fed to the settling pond in the processing area and are mostly recovered from the pond and blended into products. The remaining silts are used to rehabilitate the site.

No changes to material processing are proposed.

2.4.3 Blending

Environment Protection Licence (EPL) 3991 lists the type of wastes that can be accepted by the facility and the limits and conditions imposed on the acceptance and stockpiling of this waste. Extracted material is currently blended with these imported materials, where necessary.

No changes to material blending are proposed.

2.4.4 Stockpiling

Very little material is stockpiled in the extraction areas. Stockpiles are mainly kept in the processing area.

No changes to material stockpiling are proposed.

2.5 Access

2.5.1 Site access

The main access to the site is from Menangle Road. Menangle Road is an arterial road which provides sub-regional access. It is not proposed to change the site access for inbound materials or outbound materials.

2.5.2 Access to the Stage 8 area

Light vehicles accessing to the Stage 8 area will use the existing access under the Hume Motorway. The existing access was retained when the RMS bisected the lands when acquiring the corridor for the original Hume Highway in 1969. The existing access road under the bridge will be sealed and will comply with RMS drainage and pavements standards.

The earthmoving equipment, off-road haul truck and other plant to service the Stage 8 area will access the area via Moreton Park Road. Major plant is expected to remain onsite through-out the duration of the quarrying operations except for major servicing or replacement.

2.5.3 Product dispatch

No changes to product dispatch are proposed. Truck movements at the site (ie combined inbound and outbound movements) will not exceed an average of:

- 147 per day on Monday to Friday; and
- 80 per day on Saturday.

2.6 Quarry life

The proposed modification to the existing consent for the quarry would extend the approved life of the quarry for 15 years, from 2020 to 2035.

2.7 Biodiversity protection

A land 'swap' is proposed, surrendering the approval to extract sand and soil from the Stage 3 area (5.68 ha) for the same area (in hectares) of the Stage 8 extraction area on a 1:1 basis.

In addition, it is proposed to restore areas upstream, downstream and upslope of the extraction areas. These restoration areas are shown in Figures 2.3 to 2.5 and will form biodiversity offsets to compensate for the clearing of vegetation in the Stage 8 area that is not part of the land swap. Management of the restoration areas will include the removal of the extensive exotic vegetation in the restoration area, allowing restoration of the entire bank, back to a sustainable, high-quality, native ecosystem.

A Stage 8 area vegetation management plan will be prepared that:

- provides details of the conceptual final landform, soil stripping and vegetation clearing protocols, erosion and sediment control measures, rehabilitation of the extraction area and adjacent restoration activities;
- describes how the implementation of the biodiversity offset strategy will be integrated with the overall rehabilitation of the site; and
- details how connectivity will be managed during the rehabilitation program.

A full-time rehabilitation specialist will be employed as part of the Stage 8 area operations.

2.8 Rehabilitation and closure

2.8.1 Progressive rehabilitation of the Stage 8 area

Following completion of resource extraction, any weed-infested topsoil will be placed in the base of the extracted area followed by scalps and fines. These will be used to build up the base of the extracted area to about 64 mAHD. Following construction of the final landform, the area will be immediately planted with grasses to stabilise the surface. Native vegetation will then be established through planting and seeding. There will be ongoing active management of the rehabilitated extraction area, including weed control.

2.8.2 Final landform

The extraction area design (see Section 2.3.2), as amended to incorporate changes made since the Refusal, will result in the following final landform:

- the lower riverbank (below 64 mAHD) landform will be unchanged;
- the landform in the 10-m to 17.5-m wide horizontal setback will be unchanged;
- the land will slope down at 1:5 from the landward edge of the horizontal setback to 64 mAHD (the riverside batter);
- the infiltration swale along the toe of the riverside batter will be retained to prevent runoff from the final landform flowing overland to the river;
- a nearly-level area at about 64 mAHD gently sloping (1:50) down to the infiltration swale at the toe of the riverside batter;
- a 1:1 slope, or the exposed sandstone escarpment, down to the western edge of the extracted area; and
- the landform in the restoration area and outside of the extraction area will be unchanged.

The rate and volume of extraction will be monitored to ensure that a final landform can meet these design parameters.

Conceptual final landforms are provided in Figures 2.10 to 2.13.

As described in Section 2.3.2i, the horizontal setback area will vary between 10-m and 17.5-m wide along the length of the extraction areas, depending on the exact locations of trees within the 10-m wide horizontal setback. Conceptual final landforms are presented for a 10-m wide horizontal setback and a 17.5-m wide horizontal setback. The actual final landform will be a mixture between these two conceptual final landforms.

The accuracy of the existing contours is limited by the digital elevation model accuracy. It is not currently possible to improve this accuracy through a detailed topographic survey of the entire Stage 8 area given the density of woody weeds in much of the area. These weeds need to be cleared prior to a detailed survey which would compromise the stability of the land surface if undertaken in a single campaign across the entire Stage 8 extraction area. A qualified surveyor will survey each substage area prior to any extraction occurring in the substage and a detailed final landform for the substage will be prepared.

The base of the ephemeral creek in the southern part of the extraction area will be left at its present elevation below 64 mAHD.

The inland batter of the extraction area will be a 1:1 (vertical:horizontal) sand and soil slope or the currently buried sandstone escarpment. The exact location and slope of the buried sandstone escarpment will vary along the extraction areas. A nominal, 1:1 (vertical:horizontal) has been assumed in the conceptual final landform. Some of this area may be low exposed sandstone cliffs as currently occur upslope of the extraction area.

Over the coming decades, ongoing sand and soil deposition from the river's floods will fill the low areas, eventually recreating the current terraced benches.

2.9 Site infrastructure and services

2.9.1 Site buildings

There is a compound containing the administrative offices and allied buildings immediately at the site entrance on Menangle Road. The compound comprises:

- an existing site office and amenities building, housing offices, kitchen amenities and soil laboratory;
- an existing wheel wash and weighbridge are located at the top of an elevated bank, level with the floor level of the main building;
- an existing large workshop housing equipment and machinery as well as a storage area for ancillary machinery; and
- existing fuel supply tanks.

No changes to site buildings and infrastructure are proposed.

2.9.2 Lighting

There will be no changes to lighting in the processing and site entry areas.

No fixed lighting will be required in the Stage 8 area as extraction will only occur in daylight hours.

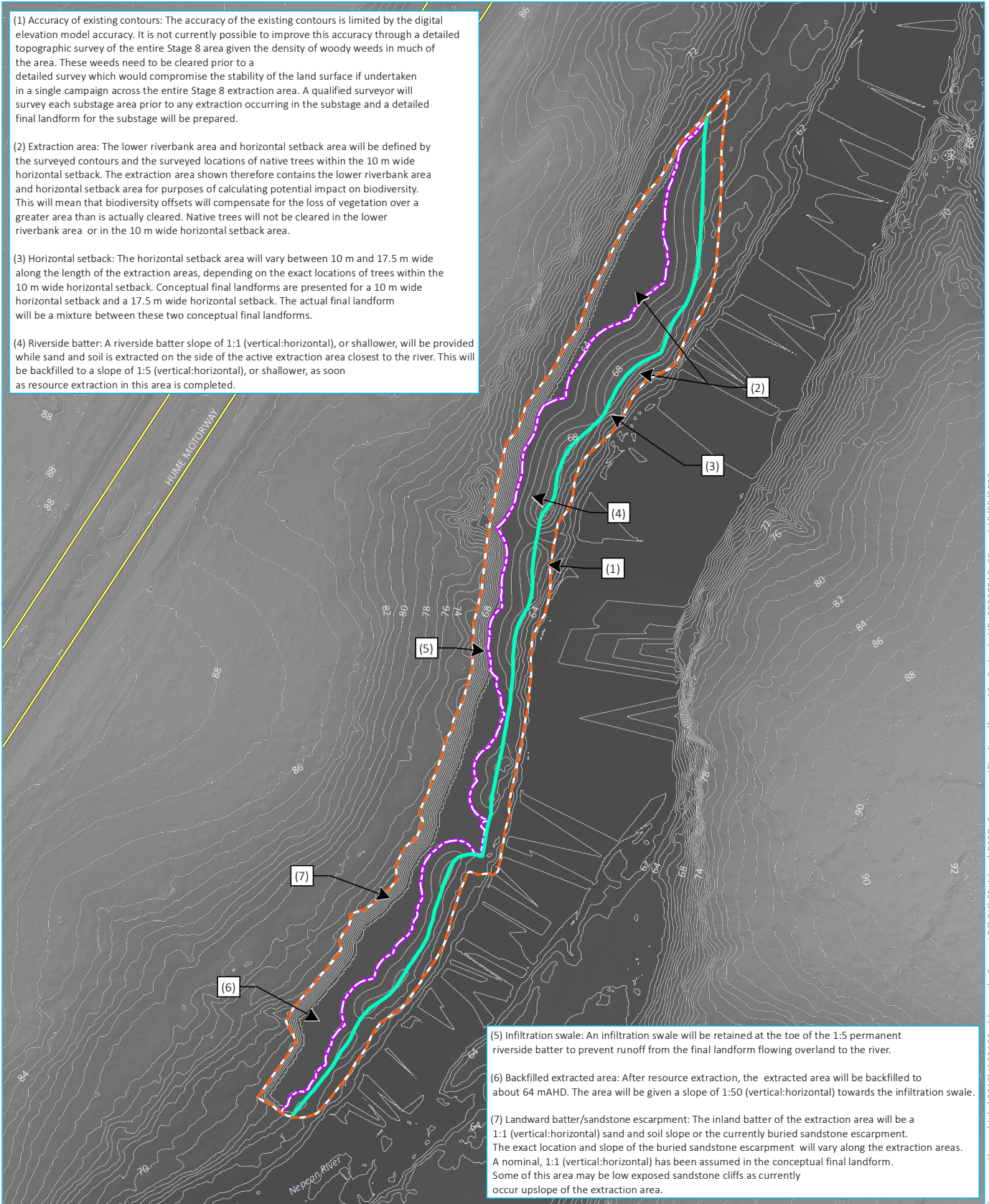
2.10 Hours of operation

The existing development consent allows the quarry to operate over the following hours:

- 6 am to 5 pm Monday to Friday;
- 6 am to 12 pm Saturday; and
- with no operations on Sundays or public holidays.

No changes to the approved hours of operation are proposed.

- (1) Accuracy of existing contours: The accuracy of the existing contours is limited by the digital elevation model accuracy. It is not currently possible to improve this accuracy through a detailed topographic survey of the entire Stage 8 area given the density of woody weeds in much of the area. These weeds need to be cleared prior to a detailed survey which would compromise the stability of the land surface if undertaken in a single campaign across the entire Stage 8 extraction area. A qualified surveyor will survey each substage area prior to any extraction occurring in the substage and a detailed final landform for the substage will be prepared.
- (2) Extraction area: The lower riverbank area and horizontal setback area will be defined by the surveyed contours and the surveyed locations of native trees within the 10 m wide horizontal setback. The extraction area shown therefore contains the lower riverbank area and horizontal setback area for purposes of calculating potential impact on biodiversity. This will mean that biodiversity offsets will compensate for the loss of vegetation over a greater area than is actually cleared. Native trees will not be cleared in the lower riverbank area or in the 10 m wide horizontal setback area.
- (3) Horizontal setback: The horizontal setback area will vary between 10 m and 17.5 m wide along the length of the extraction areas, depending on the exact locations of trees within the 10 m wide horizontal setback. Conceptual final landforms are presented for a 10 m wide horizontal setback and a 17.5 m wide horizontal setback. The actual final landform will be a mixture between these two conceptual final landforms.
- (4) Riverside batter: A riverside batter slope of 1:1 (vertical:horizontal), or shallower, will be provided while sand and soil is extracted on the side of the active extraction area closest to the river. This will be backfilled to a slope of 1:5 (vertical:horizontal), or shallower, as soon as resource extraction in this area is completed.



- (5) Infiltration swale: An infiltration swale will be retained at the toe of the 1:5 permanent riverside batter to prevent runoff from the final landform flowing overland to the river.
- (6) Backfilled extracted area: After resource extraction, the extracted area will be backfilled to about 64 mAHD. The area will be given a slope of 1:50 (vertical:horizontal) towards the infiltration swale.
- (7) Landward batter/sandstone escarpment: The inland batter of the extraction area will be a 1:1 (vertical:horizontal) sand and soil slope or the currently buried sandstone escarpment. The exact location and slope of the buried sandstone escarpment will vary along the extraction areas. A nominal, 1:1 (vertical:horizontal) has been assumed in the conceptual final landform. Some of this area may be low exposed sandstone cliffs as currently occur upslope of the extraction area.

Source: EMM (2020); DFSI (2017); ELVIS (2020)

KEY

- Stage 8 - extraction/rehabilitation area
- Inland extent of horizontal setback (10 m)
- Infiltration swale/toe of riverside 1:5 permanent batter
- Contour (1 m)
- Major road

Conceptual final landform 10 m setback
Northern extraction/rehabilitation area

Menangle Quarry Extension
Figure 2.10

\\emmsvr1\emms\jobs\2019\11\90166 - Menangle Quarry\ECGIS\02_Maps\G027_ConceptualFinalLandform_10mSetback_NE_20200515_03.mxd 15/05/2020