NSW Planning ref: DA85/2865-PA-60
Mrs Alycia O'Brien
Environmental Compliance Manager
Benedict recycling Pty Limited
11 Narabang Way
BELROSE, NSW 2085
31/03/2025

Subject: Menangle Quarry - Independent Environmental Audit Report 9 August 2023 to 8 August 2024

Dear Mrs O'Brien

I refer to the Independent Environmental Audit Report (Audit Report) for the reporting period from 9 August 2023 to 8 August 2024, including the response to Audit Report recommendations, for Menangle Quarry ("the development"), submitted for the Planning Secretary's consideration, as required under Schedule 2, Conditions D11 and D12 of the development consent DA 85/2865, as modified ("the consent").

The NSW Department of Planning, Housing and Infrastructure (NSW Planning) considers that the Audit Report, generally satisfied Condition D11 of the consent.

Please note that approval of this Audit Report is not endorsement of the compliance status of the development.

I note the non-compliance with Schedule 2, Condition B22 and advise that we will follow up this non-compliance separately.

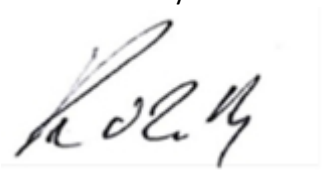
Please include a status update for all outstanding actions provided in the response to the Audit Report recommendations in the next Annual Review, until all actions are completed.

Please review, and if necessary, revise, the strategies, plans, and programs required under the consent and submit for Planning Secretary's approval, in accordance with Schedule 2, Condition D5 of the consent.

Lastly, in accordance with Schedule 2, Condition D15 of the consent, please make the copy of the Audit Report, including the response to Audit Report recommendations, available on the company website and also ensure that these documents are up-to-date.

Should you need to discuss the above, please contact Georgia Dragicevic, Senior Compliance Officer, on (02) 4247 1852 or by email to Georgia.Dragicevic@planning.nsw.gov.au.

Yours sincerely



Katrina O'Reilly

Team Leader - Compliance
Compliance
As nominee of the Planning Secretary

IAN SWANE & ASSOCIATES P/L
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Benedict Industries
33 – 39 Riverside Road
CHIPPING NORTON NSW 2170

Attention: Alycia O'Brien
Environmental Compliance Manager

27 March 2025

Menangle_250327_ISAA letter
2024_Benedict Menangle

Dear Alycia

ADDENDUM TO INDEPENDENT ENVIRONMENTAL AUDIT, BENEDICT MENANGLE SAND & SOIL QUARRY, 31 MENANGLE ROAD, MENANGLE NSW 2568 (43 pages)

This letter provides Benedict Industries (**Benedict**) and the NSW Department of Planning, Housing and Infrastructure (**DPHI**) with an addendum to the independent environmental audit (**IEA**) issued by Ian Swane & Associates dated 14 March 2025 and titled "*Benedict Menangle Sand and Soil Quarry, 31 Menangle Road, Menangle NSW 2568, Independent Environmental Audit*".

One of the conclusions made by the IEA was that no significant non-compliances were identified during the Audit Period for the Stage 8 work. The one non-compliance concerned Planning Consent Condition B22(a), which requires temporary bores to be drilled or augered progressively in each Substage to determine the local water table position immediately prior to commencing extraction in each Substage. At the time the IEA was issued, the groundwater specialist from EMM advised that no data had been provided showing that the work required by this condition had been undertaken.

Since the IEA was issued, Benedict has provided the independent environmental auditor with data indicating that Condition B22(a) has been met. The data was provided in emails issued on 21 and 25 March 2025 and comprised:

- Temporary bores had been installed in substages 8A, 8B and 8C. The well for stage 8D is soon to be installed;
- The wells were constructed by digging a hole and placing a 2m x 50mm pipe in the ground and then use a measuring rod to measure the deep to groundwater;
- A photo of temporary bore 8B is provided in **Figure 1**;
- The locations of temporary wells 8A and 8B are shown in **Figure 2**. Temporary well 8C hit bedrock and could not access the water table to measure the water table; and
- The water level elevations measured are: Well 8A 60.80 mAHD, Well 8B 60.82 mAHD, Well 8C = 60.79 mAHD (bedrock).

Based on this data, the independent environmental auditor considers that:

- The data gap identified by EMM has been address that that "compliance ranking" for Condition 22(a) should be changed from yellow to green; and
- The conclusion in executive summary and Section 4.11 regarding non-compliances needs to be changed to read that no non-compliances were identified by the independent environmental audit.

27 March 2025

IAN SWANE & ASSOCIATES P/L

Yours sincerely

Dr Ian C Swane (CPEng, CEnvP & CSCS)
Accredited EPA Site Auditor
Director, Ian Swane & Associates
Certified Site Contamination Specialist
Phone: 0418 867 112
Email: iswane@bigpond.com

Figure 1 Photo of Temporary Well 8B

Figure 2 Remaining Temporary Bore Locations

Benedict Menangle Sand and Soil Quarry

31 Menangle Road, Menangle NSW 2568

INDEPENDENT ENVIRONMENTAL AUDIT

Final | 14 MARCH 2025

IAN SWANE & ASSOCIATES

Benedict Menangle Sand and Soil Quarry, 31 Menangle Road, Menangle NSW 2568

INDEPENDENT ENVIRONMENTAL AUDIT

Document title: Benedict Menangle Quarry IEA

Document no. 1

Revision: Final

Date: 14 March 2025

Prepared by: Dr Ian Swane

File name: https://d.docs.live.net/d13c7702bd1fbdf1/Documents/IS^0A/Projects/Menangle/4_Audit/Menangle_250314_Audit Report.docx

Ian Swane & Associates Pty Ltd
ABN 51 102 396 565
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Australia

Tel: +61 (0) 418 867 112
Email: iswane@bigpond.com

Contents

1. Executive Summary

Menangle Sand & Soil Pty Ltd (MSS), a subsidiary of Benedict Recycling Pty Limited**,** is the operator of the Menangle Quarry located at 31 Menangle Road, Menangle NSW 2568. The Minister of Planning provided a consent for extracting sand and soil from the bed and banks of the Nepean River at Menangle in 1985 numbered 85/2865. MSS was granted a Modification 2 development consent (the 'Mod 2 Consent') in November 2021, which allowed for the expansion of the extraction operation to the Stage 8 area of the quarry.

Condition D11 of the Mod 2 Consent required an independent environmental audit (IEA) of the Stage 8 extraction work to be undertaken within one year of the commencement if Quarrying Operations in the Stage 8 area. Condition D12 required MSS to submit a copy of the audit report to the Planning Secretary, and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report, within three months of commencing the IEA, or within another timeframe agreed by the Planning Secretary, the Applicant must submit a copy of the audit report to the Planning Secretary. When MSS submits the audit report, it also needs to submit a timetable for the implementation of recommendations made by the audit report.

The purpose of this report is to document the results of the first IEA into operations associated with Stage 8 of the Menangle Quarry covering the period 9 August 2023 to 8 August 2024 (the Audit Period), and satisfy the requirements of Conditions D11 and D12 of the Mod 2 Consent. The Audit commenced on 20 August 2024 and was completed prior to the reporting period deadline of 14 March 2025.

The Auditor considers the weight of evidence supports the conclusion that Stage 8 operations at Menangle Quarry have been well managed over the Audit Period and an acceptable level of environmental performance achieved. This is because:

- No significant non-compliances were identified during the Audit Period for the Stage 8 work. The one non-compliance concerned Condition B22, which requires temporary bores to be drilled or augered progressively in each Substage to determine the local water table position immediately prior to commencing extraction in each Substage. To address this issue, temporary bores should be drilled in the next substage to assess whether this condition is necessary because the operational risk to groundwater is considered low;
- The Auditor is not aware of any agency notices, order, penalty notices or prosecutions against the Facility during the Audit Period;
- Stakeholder requirements as notified to the Auditor have been met or are included as recommendations for future work;
- Reasonable measures have been taken by Menangle Quarry to minimise complaints regarding the Stage 8 operation. The Auditor is not aware of any other complaints having been made by off-site receptors during the Audit Period. The Auditor considers the relatively small number of complaints made during the Audit Period supports the conclusion that operations at the site have been well managed; and
- There were no incidents during the Audit Period.

The Auditor recommends that the improvement opportunities described in this report be implemented and documented in the next Annual Review Report.

2. Introduction

2.1 Purpose

Menangle Sand & Soil Pty Ltd (**MSS**), a subsidiary of Benedict Recycling Pty Limited (**Benedict),** is the operator of the Menangle Quarry located at 31 Menangle Road, Menangle NSW 2568. The Minister of Planning provided a consent for extracting sand and soil from the bed and banks of the Nepean River at Menangle in 1985 numbered 85/2865. MSS was granted a Modification 2 development consent (the '**Mod 2 Consent'**) from the NSW Land and Environment Court (**LEC**) in November 2021, which allowed for the expansion of the extraction operation to the Stage 8 area of the quarry.

The Mod 2 Consent legally defined Menangle Quarry as Lot 10 in Deposited Plan (**DP**) 1022204, Lot 2 DP 1050479, Lot 2 DP 1133910, Lot 1 DP 1140461, Lots 1 - 2 DP 1187569, Lot 105 DP 249189, Lot 21 DP 581462 and Lots 201 – 203 DP 590247. A plan showing the location of the quarry is provided in **Figure 2-1**, with a plan showing the layout of Stages 1 to 8 provided in **Figure 2-2**.

Condition D11 of the Mod 2 Consent required an independent environmental audit (**IEA**) of the Stage 8 extraction work to be undertaken within one year of the commencement if Quarrying Operations[1] in the Stage 8 area. Condition D12 required MSS to submit a copy of the audit report to the Planning Secretary, and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report, within three months of commencing the IEA, or within another timeframe agreed by the Planning Secretary, the Applicant must submit a copy of the audit report to the Planning Secretary. When MSS submits the audit report, it also needs to submit a timetable for the implementation of recommendations made by the audit report.

Quarrying operations associated with extraction within the Stage 8 area has been divided into 13 substages labelled 8A – 8M, with their locations shown in **Figure 2-3**. These operations include both sand extraction, the operation of processing areas and any private access roads or haul roads for the carrying out of the development. The Mod 2 Consent also refers to substages 8A – 8B as Phase 1, substage 8C as Phase 2, substages 8D – 8E as Phase 3, substages 8F – 8G as Phase 4, substages 8H – 8I as Phase 5, substage 8J – 8K as Phase 6, and substages 8L – 8M as Phase 7. The locations of these seven phases are shown in **Figure 2-4**. Quarrying operations in Stage 8 commenced on 9 August 2023.

The purpose of this report is to document the results of the first IEA into operations associated with Stage 8 of the Menangle Quarry covering the period 9 August 2023 to 8 August 2024 (the Audit Period), and satisfy the requirements of Conditions D11 and D12 of the Mod 2 Consent.

The Audit commenced on 20 August 2024 when the Department of Planning, Housing and Infrastructure (**DPHI**) approved the audit team lead by Dr Ian Swane from Ian Swane & Associates (**ISAA**). DPHI provided a further approval on 20 August 2024 for specialist members of the audit team in the fields of ecology, surface water and groundwater. A extension of time for the completion of the audit was granted by the DPHI on 24/01/25, extending the reporting period to 14 March 2025. Copies of these DPHI approval letters are provided in **Appendix A**. A copy of the independent audit declaration form is provided in **Appendix B**.

[1] Defined by the Consent as the extraction, extraction, processing (including blending with waste material, stockpiling and transportation of extractive materials carried out on the site and the associated removal of vegetation, topsoil and overburden

Figure 2-1 Site Locality

(Source: Figure 1.1, Ref [25])

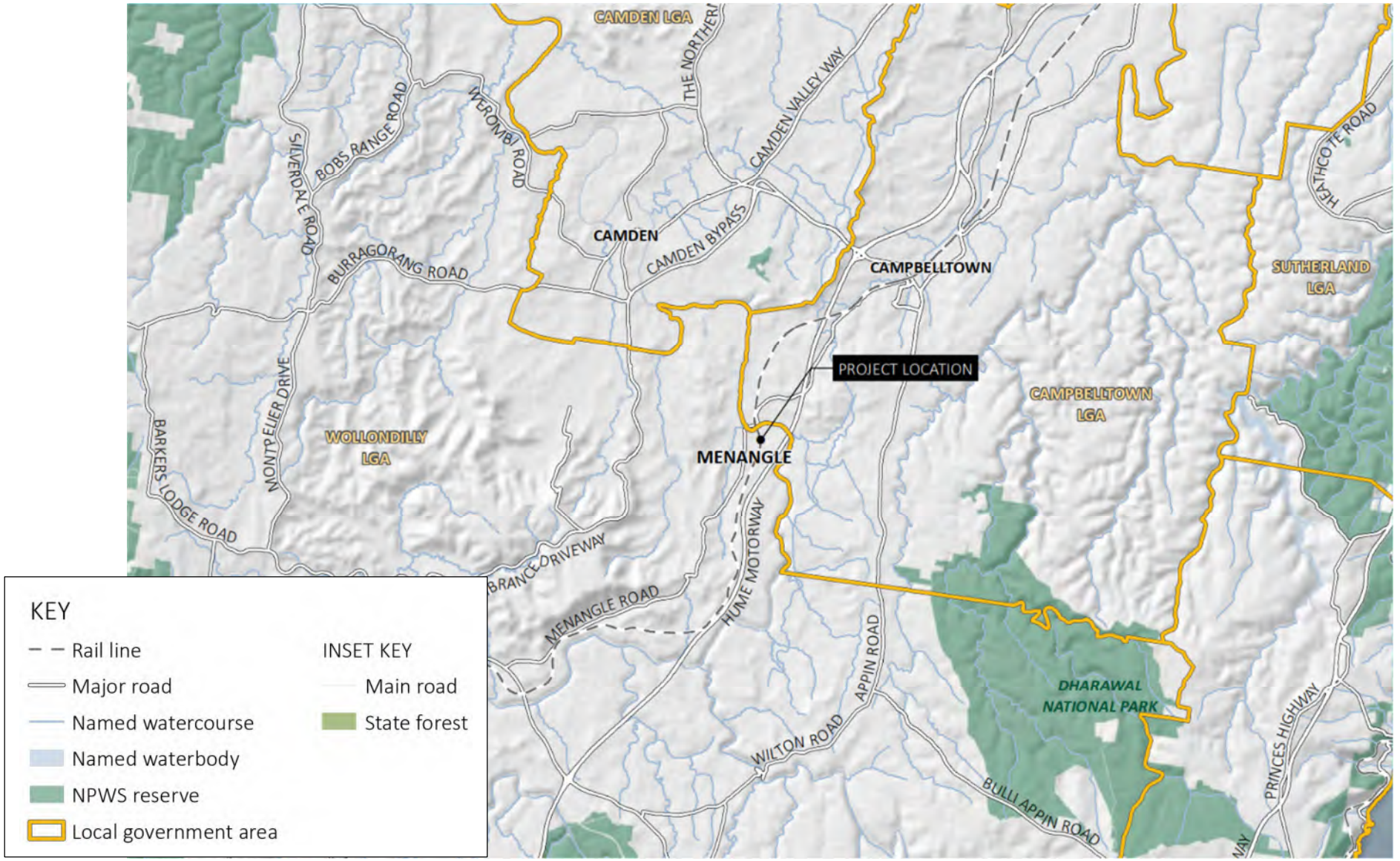


Figure 2-2 Site Layout Plan for Stages 1 to 8 (Source: Figure 1.2, Ref [25])

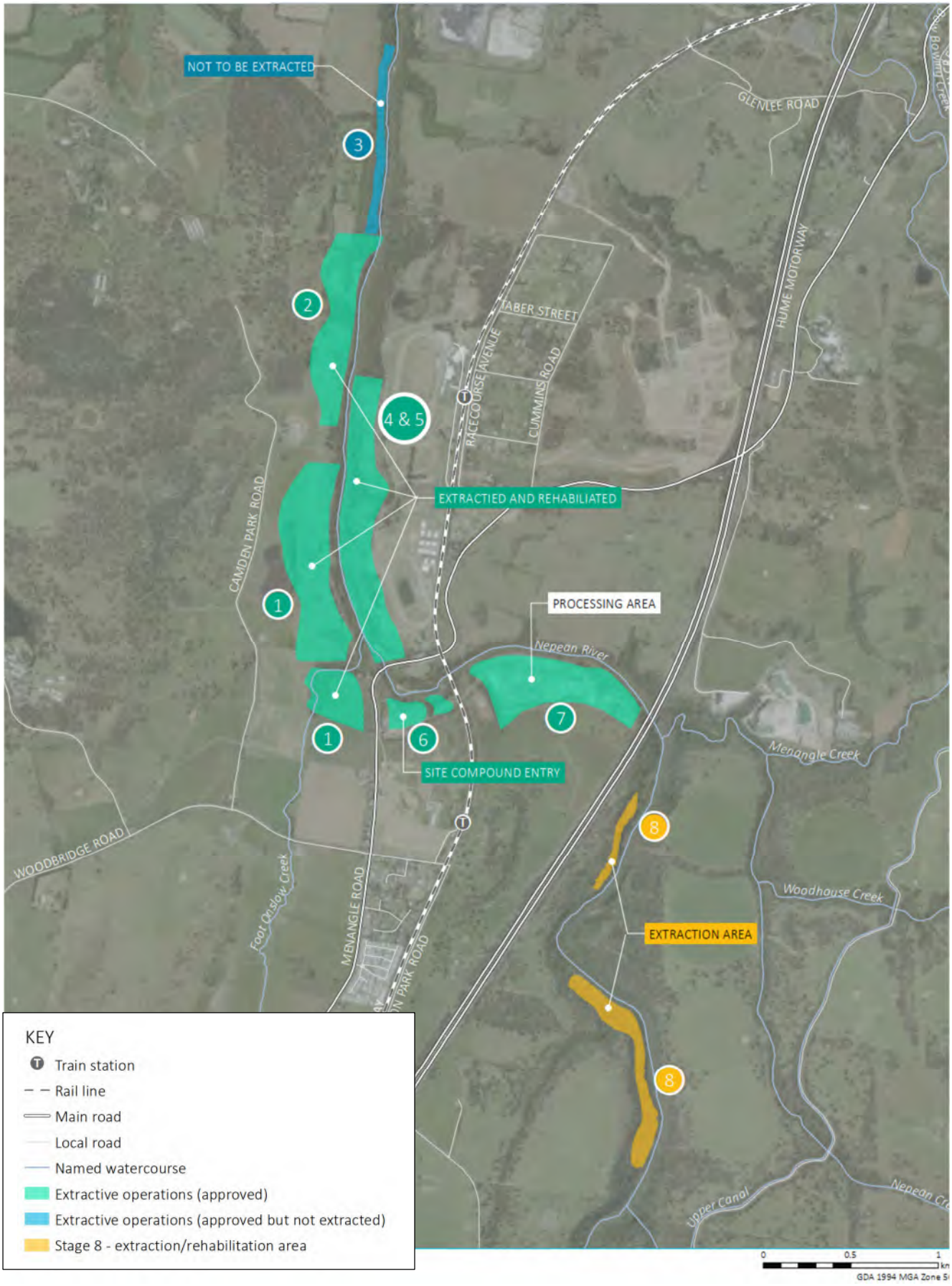


Figure 2-3 Sub-staging Plan for Stage 8 (Source: Figure 1.3, Ref [25])

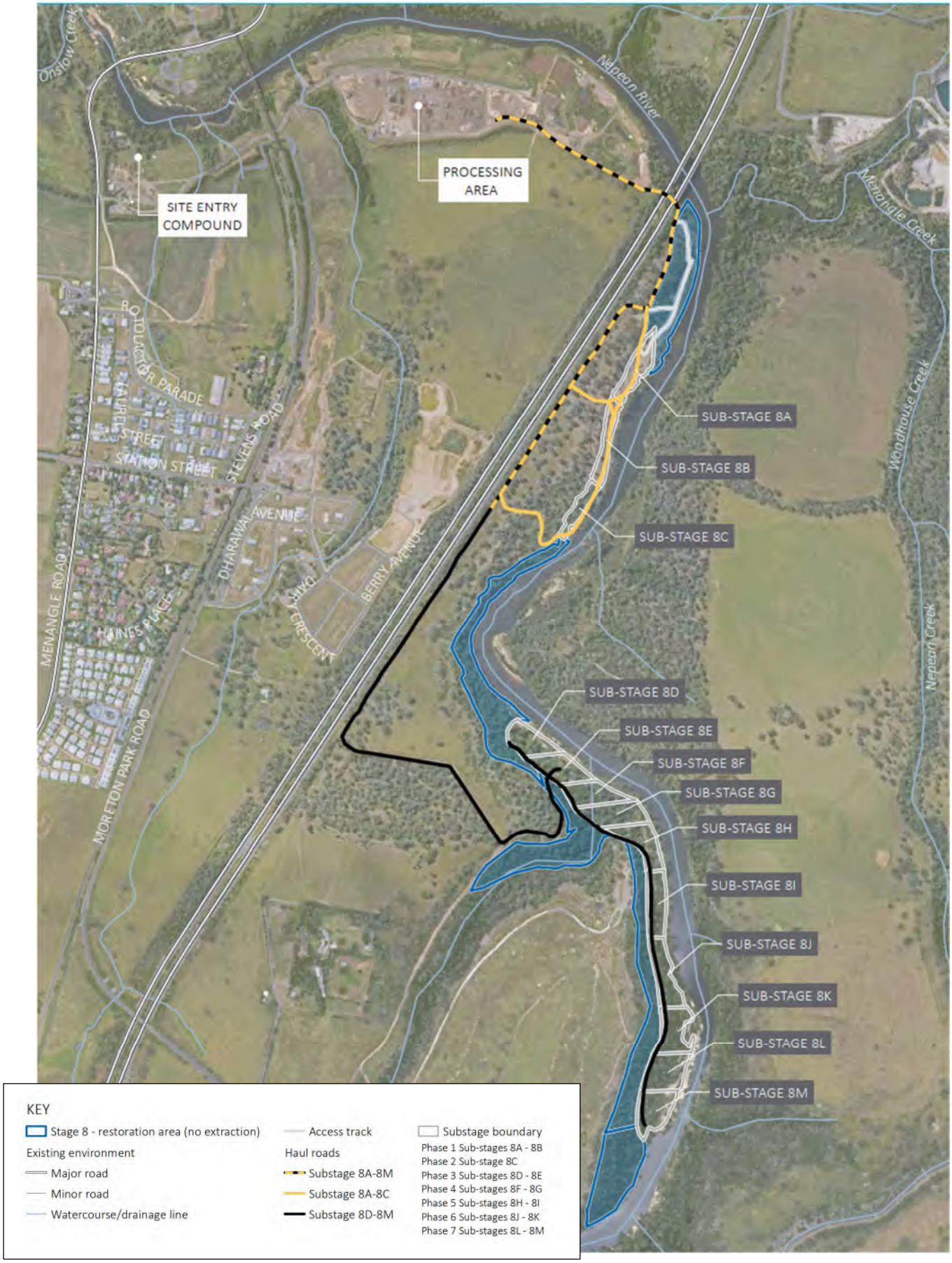
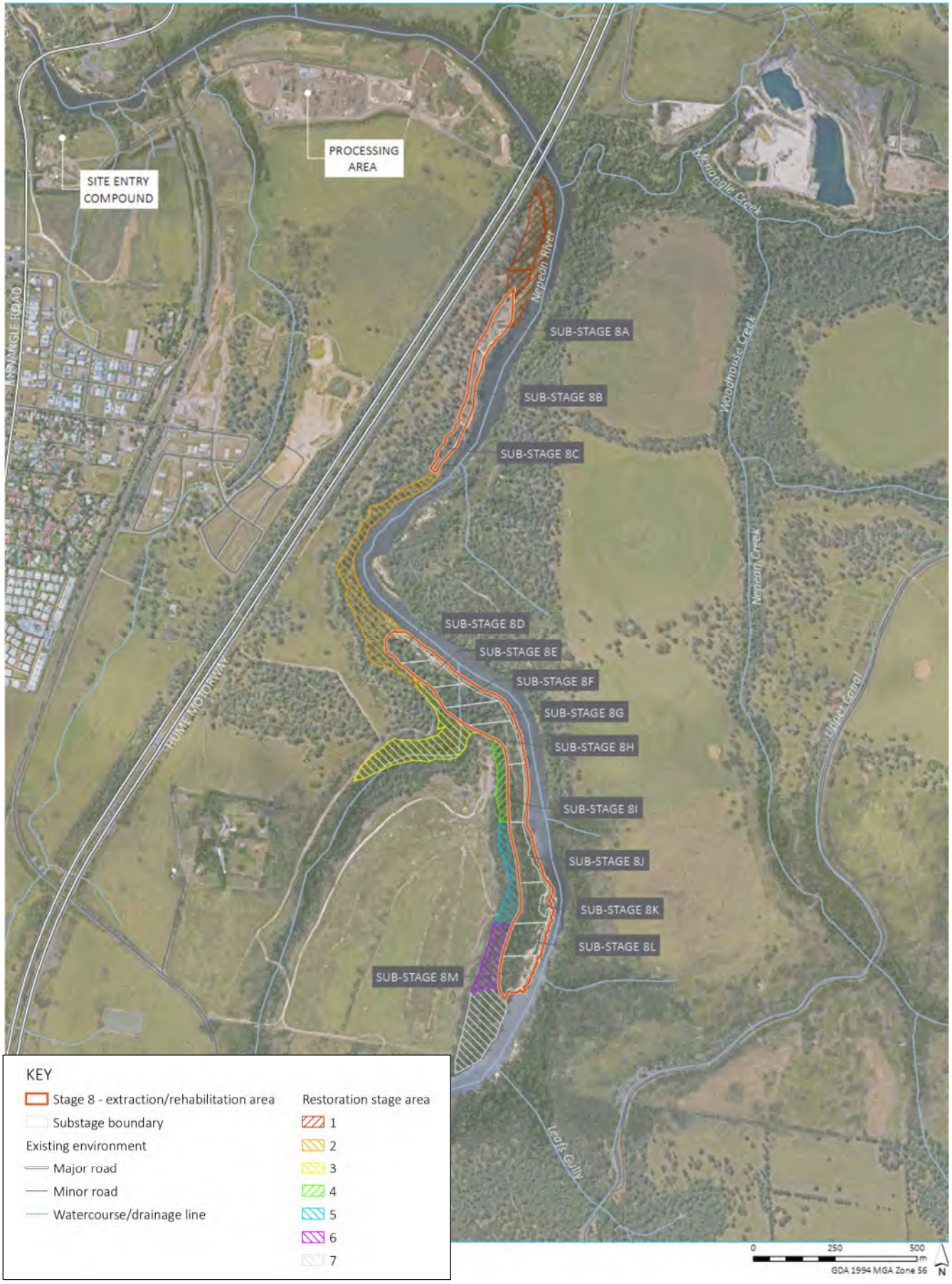


Figure 2-4 Overall Staging and Restoration Plan for Stage 8 (Source: Figure C.1, Ref [25])



2.2 Audit Requirements

Condition D11 of the Mod 2 Consent states that:

> *"Within one year of the commencement of Quarrying Operations in the Stage 8 Area, and every three years after, unless the Planning Secretary directs otherwise, the Applicant must commission and pay the full cost of an Independent Environmental Audit of the development. The audit must:*
>
> *a) be led and conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Planning Secretary;*
>
> *b) be carried out in consultation with the relevant agencies;*
>
> *c) assess the environmental performance of the development and whether it is complying with the relevant requirements in this consent, water licences and mining leases for the development (including any assessment, strategy, plan or program required under these approvals);*
>
> *d) review the adequacy of any approved strategy, plan or program required under the abovementioned approvals and this consent;*
>
> *e) recommend appropriate measures or actions to improve the environmental performance of the development and any assessment, strategy, plan or program required under the abovementioned approvals and this consent; and*
>
> *f) be conducted and reported to the satisfaction of the Planning Secretary.*

Condition D12 of the Mod 2 Consent states that:

> *"Within three months of commencing an Independent Environmental Audit, or within another timeframe agreed by the Planning Secretary, the Applicant must submit a copy of the audit report to the Planning Secretary, and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of the recommendations. The recommendations must be implemented to the satisfaction of the Planning Secretary.*
>
> *Note: The audit team must be led by a suitably qualified auditor and include experts in any fields specified by the Planning Secretary.*

The requirements of the Mod 2 Consent considered relevant to this IEA cover:

- Administrative conditions (Consent Part A);
- Specific environmental conditions (Consent Part B);
- Additional procedures (Consent Part C); and
- Environmental management, reporting and auditing (Consent Part D).

Part of Menangle Quarry operates under an Environment Protection Licence (**EPL**) issued by the NSW EPA number 3991 referred to as the Premises. The EPL defines the Premises as Part Lot 202 DP 590247, part Lot 203 DP 590247 and part Lot 4 DP 1260223. The requirements of the Consent that are considered relevant to this IEA cover:

- Administrative conditions (EPL Part 1);
- Limit conditions (EPL Part 2);

- Operating conditions (EPL Part 3);
- Monitoring and recording conditions (EPL Part 4);
- Reporting conditions (EPL Part 5); and
- General conditions (EPL Part 6).

The Natural Resources Access Regulator (**NRAR**) issued Water Licence CAA-2021-11223 for the Stage 8 sand extraction on 14 February 2022 (Ref [27])

Menangle Quarry does not require or have a mining licence.

2.3 Audit Methodology and Scope

The audit was undertaken in accordance with the DPE (2020) "*Independent Audit Post Approval Requirements*" and the requirements of the Mod 2 Consent.

The methodology and scope of work undertaken for the IER involved:

- Obtain DPHI approval of the lead Auditor and the independent team of experts approved by DPHI;
- Consulted with NSW Government agencies relevant to the audit [i.e. DPHI, NSW EPA, Wollondilly Shire Council, Campbelltown City Council, Transport for NSW (**TfNSW**), Fire and Rescue NSW (**FRNSW**)];
- Consulted with other organisation requested by DPHI [i.e. BCSG, Heritage Council of NSW, NSW Resources, Tharawal Local Aboriginal Land Council, the DPHI Water Group];
- Reviewed documentation provided by Benedict and Government agencies relevant to the audit;
- Prepared detailed audit checklists (spreadsheets) to assess and track compliance;
- Facility inspection and on-site meeting with the Benedict Environmental Compliance Officer and the Menangle Quarry Manager conducted on 24 October 2024;
- Assessed the environmental performance of the development and whether it is complying with the relevant requirements in the Mod 2 Consent, EPL 3991 issued by the NSW EPA, Water Licence CAA-2021-11223 for the development (including any assessment, strategy, plan or program required under these approvals);
- Reviewed the adequacy of any approved strategy, plan or program required under the abovementioned approvals and the Mod 2 Consent;
- Recommended appropriate measures or actions to improve the environmental performance of the development and any assessment, strategy, plan or program required under the abovementioned approvals and the Mod 2 Consent; and
- Auditor report preparation to the satisfaction of the DPHI.

2.4 Audit Team

The Audit Team was led by Dr Ian Swane, a NSW Environmental Protection Authority (**NSW EPA**) accredited Site Auditor (Accreditation No: 9821). Dr Swane has been an NSW EPA accredited Site Auditor since 1998 before the scheme formally began in 1999. He has also been an NSW EPA accredited Site Auditor in Victoria, Queensland, Western Australia and the Northern Territory. Over the past 24 years he has undertaken over 300 site audits in NSW. Dr Swane has a BE (Hons 1st Class) and a PhD from Sydney University. Ian is also a Certified Practicing (Civil) Engineer (**CPEng**) and a Site Contamination Specialist (Rego No: SC40103).

Dr Swane is a Senior Principal environmental & civil engineer with over 35 years of professional experience specialising in the investigation, assessment, remediation and management of contaminated sites, health & ecological risk assessments, environmental audits & waste management in Australia and Southeast Asia. He has investigated and remediated many of the largest contaminated sites in Australia and been a technical adviser to Government agencies on key projects (e.g. BHP Hunter Sediment Remediation Project, BHP Steel River Remediation Project, Homebush Bay Dioxin Remediation Project).

Dr Swane is also a DPHI approved Independent Environmental Auditor and a NSW EPA approved Protection of the Environment Operations (**POEO**) Act Auditor. Recent independent audits undertaken or in the process of being completed by Dr Swane for the NSW Government include:

- Independent Environmental Audit under the EP&A Act for the Benedict Recycling Newcastle Facility at Mayfield West (September 2022 – January 2023);
- NSW EPA statutory site audit for the Department of Planning Argle Terrace Upgrade Project (May 2024 – ongoing);
- NSWEPA waste audit under the POEO Act for the 7 Star Tyres Sefton facility (July – August 2022);
- NSW EPA waste under the POEO Act for the Benedict Recycling Chipping Norton facility (June - July 2022 and September – November 2023) and the Benedict Recycling Unanderra facility (September – November 2023);
- NSW EPA statutory site audit for Transport for NSW (TfNSW) WestConnex Stage 3A Motorway (2018 – ongoing);
- NSW EPA statutory site audit for NSW Land and Housing Corporation affordable housing residential estate at Wentworth Park Road Glebe (2021 – ongoing);
- NSW EPA statutory site audit for the TfNSW M6 Stage 1 motorway (2021 – ongoing);
- NSW EPA statutory site audit for Landcom Scheduled Lands at Riverstone (2017 – 2024);
- NSW EPA statutory site audit for the NSW Police Force Dubbo Police Station (2022 – 2024); and
- NSW EPA statutory site audit for the NSW Police Force Parramatta Police Station (2022 – 2024).

The DPHI approved Dr Swane from ISAA to undertake the IEA and prepare the IEA report in a letter dated 6 August 2024 (**Appendix B**). In a follow-up letter dated 20 August 2024 (**Appendix B**), the DPHI approved other members of the independent audit expert team to be:

- Jonathan Tait, EMM Associate Hydrogeologist: He specialises in mining and extractive industries, including drilling supervision, contractor management, hydraulic testing, test pumping, groundwater sampling, hydrogeological conceptualisation, impact assessments and compliance reporting. He has not previously worked for MSS;
- Lachlan Hammersley, Associate Water Resources Engineer: He has experience in a wide range of project types including drainage design, water management for linear infrastructure, specialist studies in EIS preparation, water-in-mining and industrial water management projects; and
- Philippa (Pip) Fagan, Associate Ecologist: She specialises in terrestrial vegetation survey and assessment and bird surveys and impact assessment. She is an accredited Biodiversity Assessment Method (**BAM**) Assessor. Pip has delivered projects across a range of sectors, including mining and extractive, infrastructure, and residential and commercial development. Philippa has coordinated and lead field surveys and reporting for many impact assessments using the BAM. Pip joined EMM in July 2023 and has not previously worked for MSS.

2.5 Background Information

2.5.1 Development History

Menangle Quarry is located in the Wollondilly and Campbelltown LGAs (**Figure 2-1**). The quarry 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.

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

On 10 September 2020, the LEC approved the Menangle Quarry Extension – Modification 1 (MOD1) to Development Consent 85/2865. On 5 November 2021, the Minister for Planning and Public Spaces approved the Menangle Quarry Extension – Modification 2 (Mod 2 Consent). Changes to the Consent conditions are provided in the Notice of Modification for Development Consent DA 85/2865 (Mod 2 Consent). The extracted material is to be transported to the processing area where it will be stockpiled, processed and blended with materials imported to the quarry, prior to being dispatched from the quarry. Operations (but not extraction) were to 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 offroad haul truck for the transfer of extracted materials from the Stage 8 area to the processing area using existing roads. Sand extraction in the Stage 8 area commenced in September 2023. The quarry has consent to extract the sand and soil resource in the Stage 8 area to 2035.

2.5.2 Quarry Description

In addition to 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;
- Materials storage and processing area; and

- Other minor infrastructure.

These components are to 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
- Internal haul roads.

Operations at the quarry comprise:

- 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;
- Stockpiling;
- Loading of product into trucks; and
- Product dispatch via trucks.

The main access to Menangle Quarry is from Menangle Road, which is an arterial road providing subregional access. The existing access under the Hume Motorway has been retained when Transport for NSW (**TfNSW**) bisected the lands when acquiring the corridor for the original Hume Highway in 1969. The existing access road under the bridge was to be sealed and comply with TfNSW drainage and pavements standards.

Material would then be transported beneath the Hume Motorway Menangle Bridge by off-road haul truck using existing tracks. The earthmoving equipment, off-road haul truck and other plant to service the Stage 8 area may also access the area via Moreton Park Road. Major plant was expected to remain onsite through-out the duration of the quarrying operations except for major servicing or replacement.

2.5.3 Stage 8 Conceptual Quarry Design

The most recent version of the Stage 8 area quarry design was described in Section 1.6 of the Biodiversity and Rehabilitation Management Plan (**BRMP**) prepared by EMM (11 September 2024) and approved by DPHI on 20 September 2024. A schematic of the quarrying design is provided in **Figure 2-5**. The design consists of seven main features, namely:

- Lower riverbank;
- Nepean River buffer zone (**NRBZ**);
- Riverside batter;
- Landward batter;
- Advancing quarry face;
- Trailing quarry face; and

- Base of the extraction area.

Design requirements for these features include:

- Lower riverbank: Will be retained below the 64 mAHD contour. No extraction will occur within this zone.
- NRBZ: Will provide a minimum horizontal setback of 10 m extending landward from the 64 m AHD contour on the western side of the Nepean River. Where there are native trees within the 10 m wide horizontal setback area ('Protected Trees'), 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 NRBZ will be between 10 m and 17.5 m wide. As there will be no resource extraction within this zone, there will be no resource extraction within 7.5 m of Protected Trees.
- Riverside batter: Will be inland of the NRBZ and be managed as:
  - A temporary riverside batter with a maximum slope of 1:1 m (vertical: horizontal)1, 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;
  - 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.

Figure 2-5 Quarry Progression Schematic (Source: Figure 1.4, Ref [25])

- Landward batter: Located on the side of the extraction area furthest from the river. A maximum landward batter angle of 1:1 will be maintained, except where the batter is formed by the natural sandstone rock escarpment, which may be vertical in places.
- 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.
- Trailing quarry face: Located between the active extraction area and backfilled extracted area, will face upstream. A maximum landward batter angle of 1:5 will be maintained for this face as it will face upstream in a flood. As for the riverside batter, this will mitigate the scour risk.
- 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 the base of the extraction area is always at least 1 m above the alluvial water table resulting from the normal low flow water level in the Nepean River.

2.5.4 Exclusion Zones

The Mod 2 Consent defines 'Exclusion Areas' as those areas with 1% Annual Exceedance Probability (**AEP**) peak flow velocities greater than 4 m/sec as identified in the figures in Appendix 2 and the plan required under condition A15. Condition A16 advised that the Applicant must not carry out construction works or Quarrying Operations or locate any ancillary infrastructure within the Exclusion Areas. The Exclusion Zones for Stages 8A – 8C and for Stages 8D – 8F are shown in **Figures 2-6** and **2-7**, respectively.

The Auditor has reviewed the plans and considers that the Exclusion Areas should not be breached if compliance is maintained with Condition A10 of the Mod 2 Consent, which operations to avoid the Nepean River Buffer Zone, defined as a minimum horizontal setback of 10 m extending landward from the 64 m AHD contour on the western side of the Nepean River.

Figure 2-6 Exclusion Zones for Stages 8A – 8C (Source: Fig 1 in Appn 2, MOD 2 Consent)

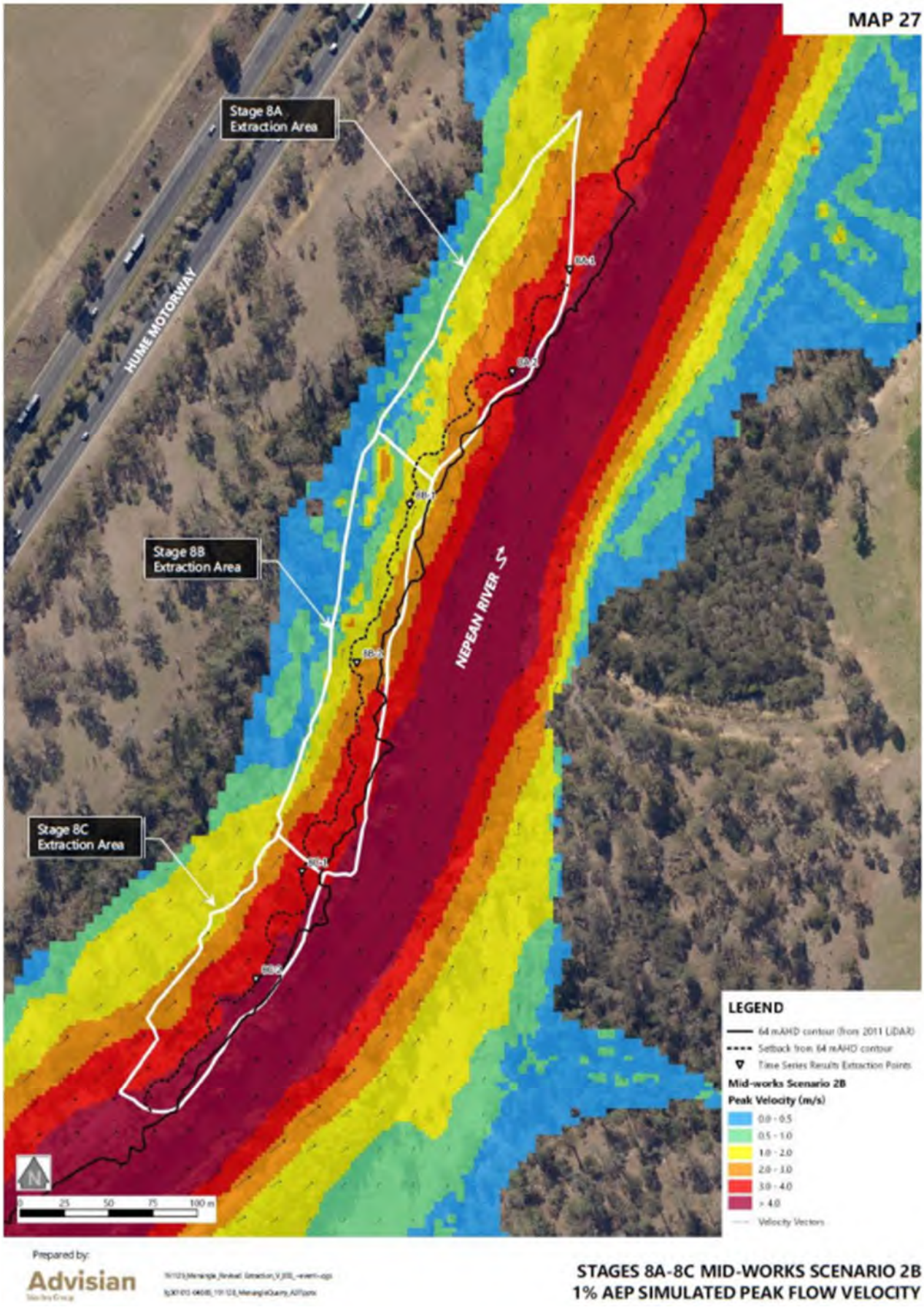
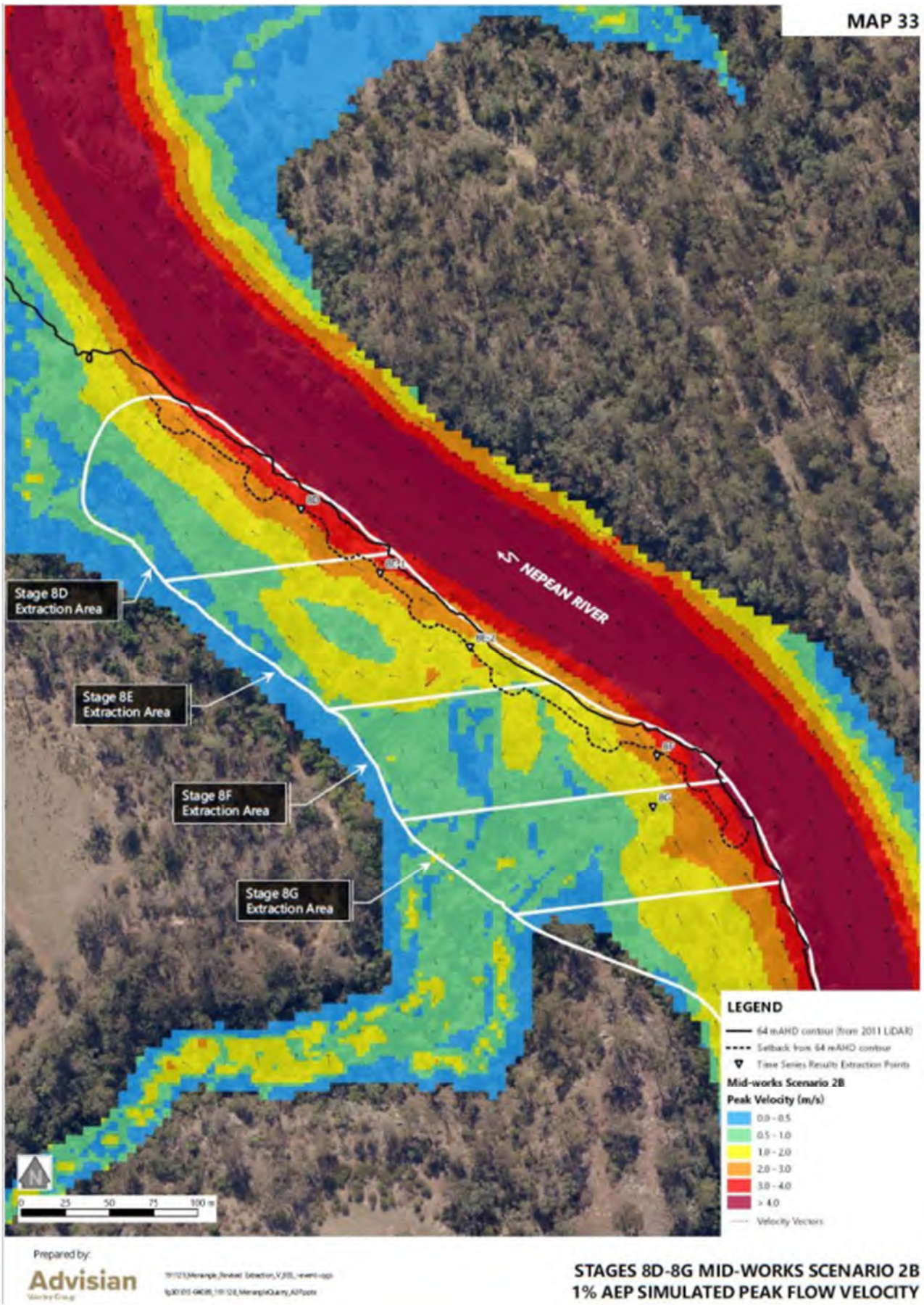


Figure 2-7 Exclusion Zones for Stages 8D – 8F (Source: Fig 2 in Appn 2, MOD 2 Consent)



2.6 Documentation Reviewed

The main documentation reviewed for this IEA comprised (in chronological order):

1. NSW EPA (December 2017) '*Compliance Audit Handbook*'
2. NSW Department of Planning, Industry and Environment (May 2020) "*Independent Audit, Post Approval Requirements*"
3. NSW Department of Planning and Environment (May 2020) '*Independent Audit Post - Approval Requirements Fact Sheet*'. 3 pages
4. NSW Land and Environment Court (November 2021) *'Modification 2, Consolidated Consent, Application Number 2018/342158, Menangle Soil and Sand Pty Limited'.* 54 pages
5. EMM (25 February 2022) '*Flood Management Plan, Menangle Sand and Soil Quarry'*. Version 3. Prepared for Menangle Sand and Soil
6. Benedict (8 August 2022) '*Pollution Incident Response Management Plan (PIRMP)*'. Revision 7, 5 pages
7. EMM (27 February 2023) '*Menangle Groundwater Monitoring Report – January 2023'*. Prepared for Benedict Industries Pty Ltd (included in Appendix A of Benedict 2023 Annual Review)
8. EMM (31 October 2023) '*Noise Compliance Assessment, Menangle Sand and Soil Quarry'*. Prepared for Menangle Sand and Soil (included in Appendix A of Benedict 2023 Annual Review)
9. EMM (16 February 2024) '*Air Quality Monitoring Campaign, Menangle Sand and Soil Quarry'*. Prepared for Menangle Sand and Soil (included in Appendix A of Benedict 2023 Annual Review)
10. EMM (12 March 2024) '*Noise Compliance Q1 Assessment, Menangle Sand and Soil Quarry'*. Prepared for Menangle Sand and Soil (included in Appendix A of Benedict 2023 Annual Review)
11. Rein Warry and No (22 March 2024) '*Design of Extraction Works, Menangle Sand and Soil, Plan View*'. Five sheets, file no: 7658 (included in Appendix A of EMM 11 September 2024)
12. Benedict (28 March 2024) '*Site Rehabilitation and Restoration Annual Progress Report, Menangle Sand and Soil Pty Ltd, Benedict Sands Menangle, (LEC 2018/342158), 01 January 2023 – 31 December 2023'* (included in Appendix A of Benedict 2023 Annual Review)
13. EMM (28 March 2024) '*Ecological Monitoring, Menangle Sand and Soil Quarry'*. Prepared for Menangle Sand and Soil (included in Appendix A of Benedict 2023 Annual Review)
14. EMM (28 March 2024) '*Menangle Sand and Soil Quarry – Review of BRMP monitoring reporting'*. Prepared for Menangle Sand and Soil (included in Appendix A of Benedict 2023 Annual Review)
15. Benedict Recycling (22 April 2024) '*Menangle Sand and Soil Annual Review (Condition D9), Benedict Sands Menangle (LEC 2018/342158) 01 January 2023 -0 31 December 2023*'
16. EMM (2 May 2024) '*Menangle Groundwater Monitoring Report – April 2024'*. Prepared for Benedict Industries

17. EMM (June 2024) '*Traffic Management Plan, Menangle Sand and Soil Quarry'*. Version 9. Prepared for Menangle Sand and Soil
18. Benedict (10 June 2024) '*NSW EPA Annual Return, Menangle Sand & Soil Pty Ltd, Licence 3991, Reporting Period 11 June 2023 to 10 June 2024'*. 5 pages
19. EMM (28 June 2024) '*Noise Management Plan, Menangle Sand and Soil Quarry*'. Version 8. Prepared for Menangle Sand and Soil Pty Ltd
20. EMM (28 June 2024) '*Air Quality Management Plan, Menangle Sand and Soil Quarry*'. Version 10. Prepared for Menangle Sand and Soil Pty Ltd
21. NSW EPA (1 July 2024) '*Environment Protection Licence Number 3991, Menangle Sand & Soil Pty Ltd, Menangle Road, Menangle NSW 2568"*
22. EMM (28 August 2024) '*Environmental Management Strategy, Menangle Sand and Soil Quarry*'. Version 5. Prepared for Menangle Sand and Soil Pty Ltd
23. EMM (28 August 2024) '*Aboriginal Heritage Management Plan, Menangle Sand and Soil Quarry – Stage 8 Area*'. Version 5. Prepared for Menangle Sand and Soil Pty Ltd
24. EMM (9 September 2024) '*Soil and Water Management Plan, Menangle Sand and Soil Quarry*'. Version 5. Prepared for Menangle Sand and Soil Pty Ltd
25. EMM (11 September 2024) '*Biodiversity and Rehabilitation Management Plan, Menangle Sand and Soil Quarry*'. Version 5. Prepared for Menangle Sand and Soil Pty Ltd
26. NSW EPA (11 June 2024) '*Environmental Protection Licence 3991 for Menangle Sand & Soil Pty Ltd, Menangle Road, Menangle NSW 2568'*. 20 pages
27. Natural Resources Access Regulator (14 February 2022) Water Licence CAA-2021-11223 for Stage 8 sand extraction. 8 pages
28. Benedict Recycling (26 February 2025) Email providing data relevant to DPHI issues raised in 23/10/24 Planning NSW email
29. Benedict Recycling (28 February 2025) Emails providing copy of Road Safety and Condition Audit completed on 28 February 2025 (Condition B49) and Benedict plant and maintenance planner (condition A33)
30. Benedict Recycling (7 March 2025) Email providing a feedback for condition A18 (copy of the MSS weeding log) and condition B29 (water take data)
31. Benedict Recycling (6 & 11 March 2025) Emails providing a spreadsheet containing all groundwater data from Stage 8A bores for the period August 2023 to February 2025 and photos of flood events

2.7 Abbreviations

ACHMP	Aboriginal cultural heritage management plan
AEP	Annual Exceedance Probability
AQMP	Air quality management plan
AWS	Automatic weather station
BAM	Biodiversity assessment method
B&D waste	Building and demolition waste
BCSG	Biodiversity, Conservation and Science Group within the Department of Climate Change, Energy, the Environment and Water
BRMP	Biodiversity and rehabilitation management plan
CAA	Controlled Activity Approval
DGV	Default guideline value
DP	Deposited plan
DPHI	Department of Planning, Housing and Industry
EC	Electrical conductivity
ECMP	Ephemeral creek management plan
EMS	Environmental management strategy
ENM	Excavated natural material
EPA	Environment Protection Authority
EPL	Environment Protection Licence
FMP	Flood management plan
FRNSW	Fire and Rescue NSW
GME	Groundwater monitoring event
GPS	Global positioning system
HTW	High Threat Weed list using NSW Biodiversity Assessment Method
IEA	Independent environmental audit
LEC	Land and Environment Court (NSW)
MSS	Menangle Sand & Soil Pty Ltd
NMP	Noise monitoring plan
NRAR	Natural Resources Access Regulator
NRBZ	Nepean River buffer zone
NSW	New South Wales

PIRMP	Pollution incident response management plan
PM	Particulate matter
POEO Act	Protection of the Environment Operations Act 1997
SRRAPR	Site rehabilitation and restoration annual progress report
SWMP	Soil and water management plan
TARP	Trigger action response plan
TfNSW	Transport for NSW
TMP	Traffic management plan
VENM	Virgin excavated natural material

3. Audit Methodology

3.1 Selection and Endorsement of Audit Team

Refer **Section 2.4**.

3.2 Independent Audit Scope Development

The audit scope was developed through the Auditor undertaking:

- **Task 1 Early work** that involved:
  - Reviewing the DPE (May 2020) audit guideline;
  - Reviewing documentation on the environmental performance of the Menangle Quarry available from the Benedict website;
  - Reviewing additional documentation on the Site requested by the Auditor and provided by Benedict for the Audit Period;
  - Reviewing data available on the POEO Public Register[2] and search for any applications, notices, convictions, civil proceedings, enforceable undertakings, and penalty notices concerning the Premises;
  - Reviewing Water Licence CAA-2021-11223 for the Stage 8 sand extraction issued by the NRAR on 14 February 2022;
  - Initial consultation with agencies and other organisations specified by the DPHI, which involved email requests for information; and
  - Preparing two detailed audit checklists (spreadsheets) to assess and track compliance with the Consent and the EPL. A copy of these checklists was sent to Benedict for review and comment prior to Task 2.
- **Task 2 Site inspection and on-site meeting** involved:
  - Inspecting Menangle Quarry in the company of the Benedict Environmental Compliance Manager and Quarry Manager. The Auditor examined conditions within the quarry and adjacent to site boundaries. Facilities inspected included:
    - *Site compound entry, signage, security, on-site haul roads, weighbridge, wheel wash;*
    - *Site compound including site offices, amenity buildings, workshops, fuel and dangerous goods storage areas, equipment maintenance shed, wheel wash, surface water management infrastructure;*
    - *Past extraction operations and rehabilitated areas;*
    - *Active extraction operations including work areas, river banks, base of excavated areas, soil stockpiles, setbacks, sedimentation ponds, infiltration swales, other environmental control measures, monitoring locations;*
    - *Soil processing area including sorting and screening areas, storage sheds, stockpiles and environmental control measures;*

[2] https://www.epa.nsw.gov.au/licensing-and-regulation/public-registers

- *The aboriginal scar tree (TN1); and*
- *Conditions along the Nepean River and ephemeral creek.*

- The Auditor holding an on-site meeting with the Benedict Environmental Compliance Manager and Quarry Manager to:
  i. discuss observations of site conditions and environmental practices made by the Auditor;
  ii. discuss audit documentation provided by Benedict; and
  iii. discuss non-compliances (if any) identified during the site inspection.

- **Task 3 Data assessment** involved:
  - Further consultation with agencies / organisation as required to collect additional data;
  - Data assessment;
  - Include audit reviews provided by ecology, surface water and groundwater experts on the audit team;
  - Further discussions with Benedict; and
  - Finalisation of Independent Audit Tables.
- **Task 4 Reporting** involved preparing the audit report in accordance with DPHI audit requirements.

3.3 Compliance Evaluation

The audit process was used to determine the compliance status of environmental operations undertaken at Menangle Quarry over the Audit Period (9 August 2023 to 8 August 2024). Conclusions made by the audit were based on a weight of evidence approach that used data collected from multiple sources, such as:

- Reviews of environmental monitoring data and mitigations measures documented in reports prepared by environmental consultants engaged by Benedict documented in **Section 3.4**. These reviews covered:
  - Noise;
  - Air quality;
  - Surface water quality;
  - Groundwater;
  - Erosion and sediment control;
  - Flood management;
  - Ephemeral creek management;
  - Product transport; and
  - Biodiversity and rehabilitation.
- Findings of earlier reviews and approvals given by NSW Government agencies (e.g. DPHI and NSW EPA) documented in **Section 3.5**.

- Data provided by NSW Government agencies during the agency consultation process relevant to the audit using the methodology described in **Section 3.6**.
- Site inspection and on-site meeting conducted on 24 October 2024 between the Auditor, Benedict Environmental Compliance Manager and Quarry Manager using the methodologies described in **Sections 3.7** and **3.8**, respectively.
- Findings made by audit team experts in ecology, surface water and groundwater using the methodology described in **Section 3.9**.

3.4 Review of Monitoring & Mitigation Measures

3.4.1 Noise

In terms of noise management, the MOD 2 Consent required that:

- Noise levels at Menangle Quarry meet a set of noise criteria (Conditions B4 – B5);
- Specified operations conditions that did not give rise to unacceptable noise levels (Condition B6); and
- A noise management plan (**NMP**) be prepared in consultation with the NSW EPA, approved by DPHI, and then implemented (Conditions B7 – B9).

The first version of the NMP was issued on 29 November 2020. Version 7 dated 25 February 2022 addressed the requirements specified in the MOD 2 Consent. The current version 8 is dated 28 June 2024 (Ref [19]). The NMP (Section 1.9) advises that it was prepared in consultation with the NSW EPA. Consultation included an EMM letter (14/10/20), provision of a draft plan, and consultation during preparation of the Mod 2 development application. On 6/06/24, the NSW EPA raised no concerns regarding the project.

The 2023 Annual Review Report[3] advised that the first operational noise assessment was commenced at Menangle Quarry by EMM in September 2023. The assessment was conducted within two months of quarry operation commencement (4 September 2023) and was completed on 6 October 2023. The EMM monitoring report was dated 31 October 2023 (Ref [8]). A copy of the monitoring report was included in Attachment A of the 2023 Annual Review Report. EMM concluded that the "Noise levels from site complied with all relevant limits and consent noise conditions". A copy of the report was reported to have been forwarded to the NSW EPA.

The 2023 Annual Review Report further advised that the first of the required quarterly attended noise monitoring was conducted by EMM on 28 February 2024. The results of the Q1 monitoring were documented in an EMM report dated 12 March 2024 (Ref [10]). In the report EMM concluded that "Noise levels from the site complied with all relevant limits and noise conditions."

[3] Section 3 & Appendix 4, Ref [15]

3.4.2 Air Quality

In terms of air quality management, the MOD 2 Consent required that:

- No offensive odours were generated (Condition B10);
- Air quality at Menangle Quarry meet a set of air quality criteria (Conditions B11 & B12);
- Specified operations conditions that did not give rise to unacceptable air pollution levels (Condition B13); and
- An air quality management plan (AQMP) be prepared in consultation with the NSW EPA, approved by DPHI, and then implemented (Conditions B14 – B16).

The first version of the AQMP was issued on 31 November 2020. Version 9 dated 31 March 2022 addressed the requirements specified in the MOD 2 Consent. The current version 10 is dated 28 June 2024 (Ref [20]). The AQMP (Section 1.9.1) advises that it was approved by the NSW EPA on 26 November 2020 and then by DPHI on 14 April 2021. The current version of the AQMP was approved by DPHI on 13 September 2024.

Short-Term Ambient Monitoring

During the Audit Period (9 August 2023 – 8 August 2024), EMM was commissioned to manage two short-term ambient air quality monitoring campaigns at Menangle Quarry. The results of this work were documented in the EMM (16 February 2024) report.

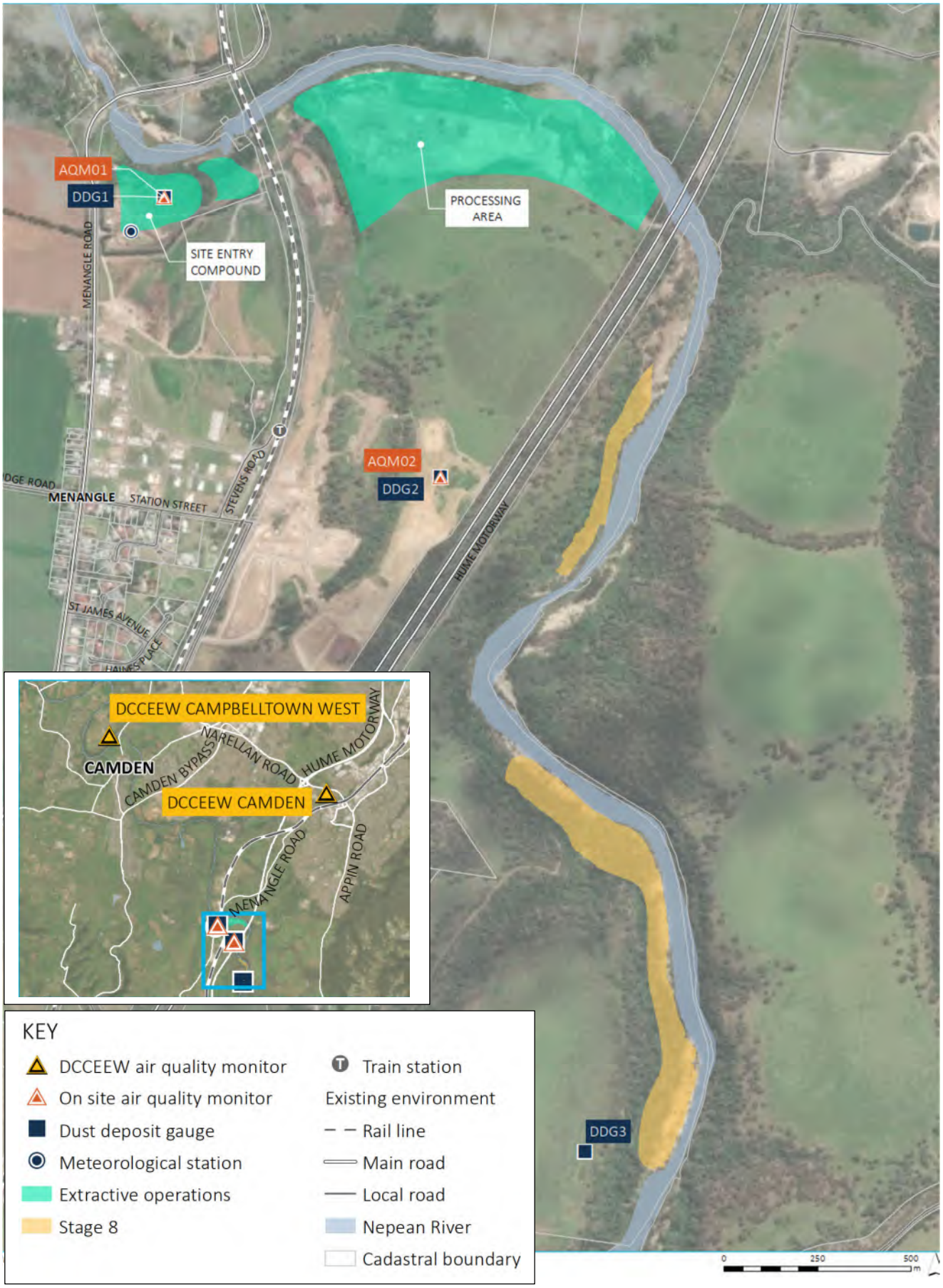
Two 4-week monitoring campaigns were completed during November to December 2023 and December 2023 to January 2024 using two continuous particulate matter (**PM**) monitoring units to record concentrations of PM10 and PM2.5. Meteorological measurements for the monitoring periods were sourced from the Menangle automatic weather station (**AWS**). The on-site PM monitoring data was also compared with monitoring data for the same periods from the NSW EPA Campbelltown West and Camden air quality monitoring stations.

The monitoring equipment was deployed co-located with dust deposition gauges (DGG1 – east of the site entry, and DDG2 – south of the processing area), as shown in **Figure 3-1**.

The monitoring results showed:

- One exceedance of the 24-hour PM10 criterion (50 µg/m³) was recorded at the AQM01 monitoring location due to the influence of local lawn mowing emissions, no exceedances were recorded at the 3 other monitoring locations;
- No exceedances of the 24-hour average PM2.5 criterion (25 µg/m³) were recorded at any of the monitoring locations; and
- The PM10 and PM2.5 concentrations recorded at the quarry were generally comparable with the concurrent measurements at the NSW EPA Campbelltown West and Camden air quality monitoring stations for the two campaign periods. This indicated that regional emissions sources are the primary driver of ambient particulate matter concentrations measured at the quarry.

Figure 3-1 Air Quality Monitoring Network (Source: Figure 1.1, Ref [9])



Regular Air Quality Monitoring

The 2023 Annual Review Report[4] also advised that permanent dust monitors are located on site at three locations (DDG1 – DDG3), as shown in **Figure 3-1**. Since quarry operations commenced on Stage 8, the results of the dust monitoring have been posted online at www. benedict.com.au.

Summary dust monitor results from September 2023 – December 2023 were listed in the 2023 Annual Review Report. Benedict advised that these dust monitoring results were generally compliant. The only monitoring anomaly was in the November/December period at DDG1 (site entry compound), where Benedict reported that the results were impacted by:

- Seasonal mowing in preparation for bushfire season; and
- Possible impacts from the nearby Menangle Road and significant land subdivision release earthworks to the north and south of this monitoring location.

The Auditor considered the weight of evidence supported these conclusions because:

- Earlier monitoring conducted in September and October 2023 recorded much lower ash content and combustible matter; and
- The generally compliant short-term air monitoring data reviewed in the previous section.

Mitigation Measures

The general air quality control measures required by the AQMP[5] include:

- The use of wet suppression by water cart along all unpaved transport routes on site;
- The use of water sprays to exposed surfaces and material storage stockpiles during periods of hot, dry and windy conditions;
- The use of water sprays along the haul road between the site entrance and the processing area;
- Ongoing active rehabilitation of completed quarrying areas;
- Application of water sprays at all screens at the processing plant;
- Application of water sprays at conveyor transfer points at the processing plant; and
- Use of amenity bunds at the processing plant and quarrying areas to reduce the potential for wind-blown dust generation.

Control measures for the haul road include:

- The quarry's 20 km/h speed limit will apply along the Stage 8 area haul road;
- Fixed irrigation installed along the part of the haul road that is being used for the active substage;
- Use of a water cart to supplement the fixed irrigation if additional water is required to control dust emissions;
- Sealing the road surface with a clean coarse aggregate or equivalent;

[4] Section 3 & Attachment C, Ref [15]
[5] Section 5, EMM (28/06/24)

- Minimising the surface silt content of the roads; and
- Implementing other surface treatment options such as chemical suppressants or paving.

Control measures to minimise diesel combustion emissions are:

- Any new equipment purchased for site will meet the US-EPA Tier 2 emission standards;
- All plant and equipment will be regularly serviced and maintained to meet manufacturers emissions specifications, with all maintenance to be logged and stored on site available for review at any time; and
- Idling of trucks, plant and equipment on site will be minimised wherever practicable to do so.

3.4.3 Surface Water Quality

In terms of surface water quality, the MOD 2 Consent required that a soil and water management plan (**SWMP**) be prepared that included a surface water management plan approved by DPHI (Conditions B36 – B39).

The first version of the SWMP was issued on 24 March 2021. Version 3 dated 25 February 2022 addressed the requirements specified in the MOD 2 Consent. The current version 5 is dated 9 September 2024 (Ref [24]). The current version of the SWMP was approved by DPHI on 20 September 2024.

WaterNSW Monitoring

The SWMP[6] advised that the Nepean River water level and streamflow are measured at the WaterNSW at Menangle Weir stream gauge (212238) located 250 m downstream of the processing area. The Stage 8 extraction area is expected to be inundated by flooding. Flood conditions at the quarry have been validated against water level data measured at Menangle Weir.

Water temperature and electrical conductivity (**EC**) are measured at the Nepean River at Menangle Weir (212238) stream gauge by WaterNSW. Monthly average water temperatures range from 9 °C in July to 27 °C in January. Electrical conductivity is fresh and typically ranges between 100 and 250 µS/cm. Lower electrical conductivities are generally observed during high flow conditions when rainfall runoff contributes a greater portion of streamflow. Water quality in the Nepean River is summarised in the Aquatic Ecology Assessment, Menangle Weir Pool Nepean River (Marine Pollution Research 2019).

The SWMP[7] concluded that the baseline monitoring data indicated that the Nepean River is fresh with EC and turbidity ranges generally meeting the ANZG (2018) default guideline values (**DGVs**). Water pH levels near the quarry were observed to be slightly acidic with some samples being lower than the DGV range.

[6] Section 5.1, EMM (9 September 2024)
[7] Section 5.5, EMM (9 September 2024)

Menangle Quarry Monitoring

The SWMP[8] specified a surface water monitoring program be undertaken as part of the Stage 8 extraction work. The objective of the surface water monitoring program is to collect data to enable:

- The quality of surface water within the quarry's water management system and receiving waters to be progressively characterised;
- The site water balance to be progressively updated (as required); and
- Assessment of compliance with the Consent and license conditions.

Monitoring locations are shown in **Figure 3-2**. An overview of the surface water monitoring program documented in the SWMP is provided in **Table 3-1**.

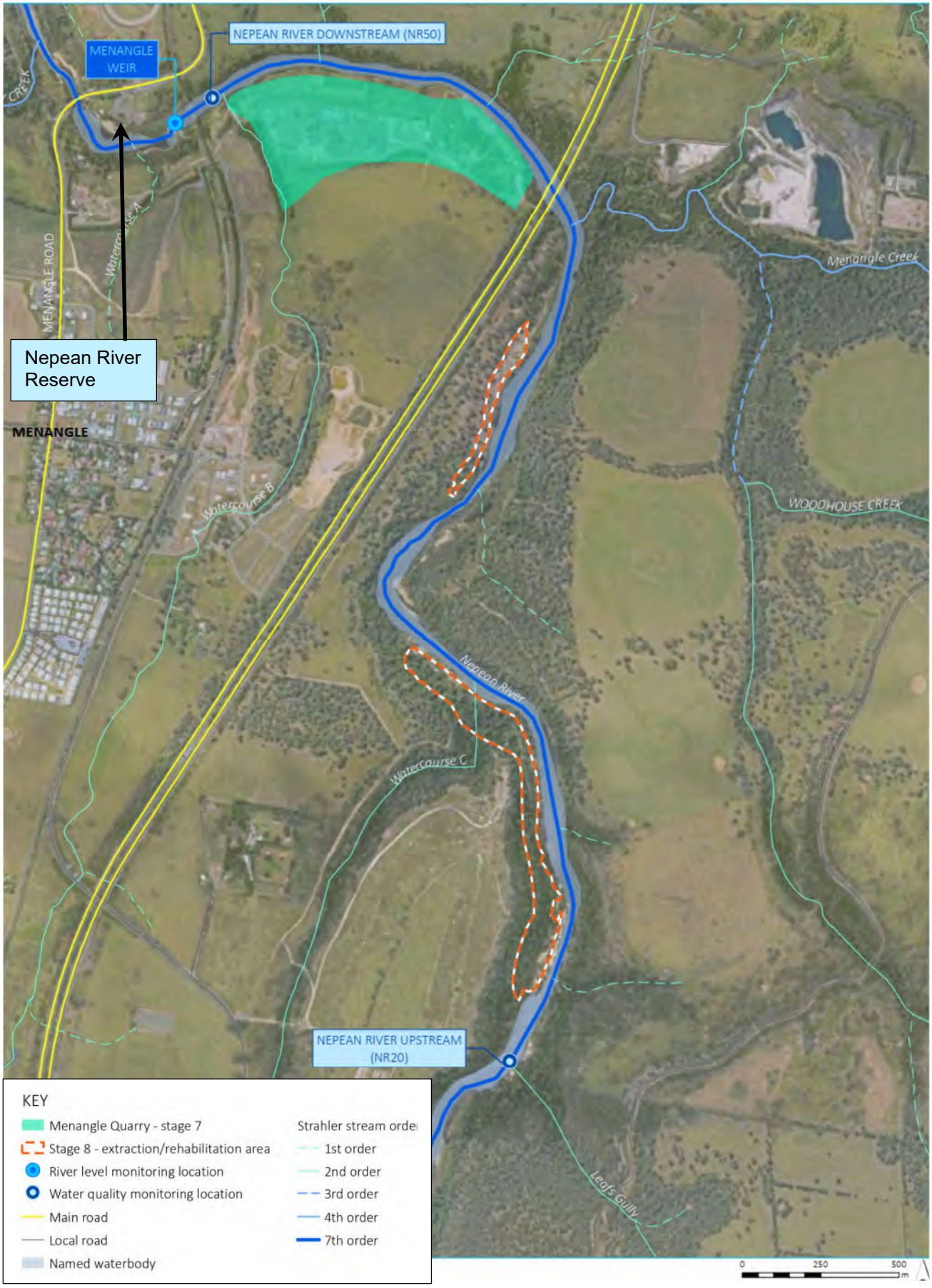
Table 3-1 Surface water monitoring program overview (Source: Tables 5.5 & 5.6, Ref [24])

Monitoring aspect	Objective	Monitoring locations	Monitoring description
River level	To monitor water levels in the Nepean River adjacent to the site.	• Nepean River at Menangle Weir (212238)	River levels obtained from the Water NSW gauging station (212238).
Process water	Record process water volumes to inform the site water balance.	• Water cart use • Nepean River to WMD01	Monthly process water volumes will be recorded either by a cumulative flow meter or daily tanker load count.
Discharges	To record the occurrence of site discharges.	• Processing area	The date and location of discharges (should they occur) will be recorded.
Water quality	To monitor the quality of water in the active extraction area sedimentation basins and in the Nepean River both upstream and downstream of the site.	• Active Stage 8 sedimentation basin • Nepean River (NR20 and NR50) • Processing pond in the Stage 7 area	Monitoring is to be undertaken via grab samples at each location. Samples are to be collected on a monthly basis for the first 12 months and quarterly thereafter.

Category	Analyte to be tested	Analysis method
General	• Temperature • pH • Electrical conductivity	To be measured using a portable water quality meter in the field.
	• Turbidity • Total suspended solids • Major ions • Total hardness as $CaCO_3$ • Oil and grease	Analysis to be undertaken by a NATA certified laboratory.
Nutrients	• Ammonia, oxidised nitrogen, organic nitrogen and total nitrogen • Reactive and total phosphorus	Analysis to be undertaken by a NATA certified laboratory.
Dissolved metals	• Al, As, B, Cd, Cr, Cu, Fe, Mn, Hg, Ni, Pb, Se, Ag and Zn	Analysis to be undertaken by a NATA certified laboratory.

[8] Section 5.4, EMM (9 September 2024)

Figure 3-2 Surface Water Monitoring Locations (Source: Figure 5.7, Ref [24])



The 2023 Annual Review Report[9] advised that Menangle Quarry commenced surface water monitoring in March 2024 initially on a monthly basis for the first 12 months and then on a quarterly basis. The first 9 months of data will therefore be documented in the 2024 Annual Review Report.

Management

The SWMP[10] advised that a surface water management system is in place for the existing processing area and Stage 7 extraction area. The existing processing area will be used to process, wash, blend and stockpile quarry material extracted from the Stage 8 area. Hence the existing surface water management system would be retained. Additional surface water management measures will be implemented for the Stage 8 extraction area. The surface water management system aims to:

- Maximise the separation of clean and quarry affected water runoff;
- Minimise discharges from the site by maximising the re-use and recycling of water onsite;
- Minimise discharges of quarry affected water by capturing runoff from the existing processing area and active extraction area in water management storages prior to re-use or infiltration and evaporation; and
- Minimise potential for erosion and scour by implementing control measures in accordance with Managing Urban Stormwater: Soils and Construction (Landcom 2004).

The SWMP[11] also advised that the quarry would be operated in accordance with the SWMP to prevent discharges from the quarry or the degradation of the water quality in the Nepean River or its tributaries. Surface water assessment criteria have been developed using the default guideline values presented in ANZG (2018). The default trigger values provided in ANZECC & ARMCANZ (2000) are used where a parameter DGV is not yet defined in ANZG (2018). The surface water assessment trigger values are provided in Table 5.7 of the SWMP.

Controls in Stage 8 will be progressively relocated as the quarry advances. Catchment areas and the key water management infrastructure in the processing area are shown in **Figure 3-3**.

The Stage 7 extraction area has not been included in the description of the water management system as operations have ceased and the area will be rehabilitated as described in the Biodiversity and Rehabilitation Management Plan. The quarry activities and water management controls in each catchment are described in **Table 3-2**.

[9] Section 3, Ref [15]
[10] Section 5.2, EMM (9 September 2024)
[11] Section 5.5, EMM (9 September 2024)

Figure 3-3 Surface Water Management System Overview (Source: Figure 5.4, Ref [24])

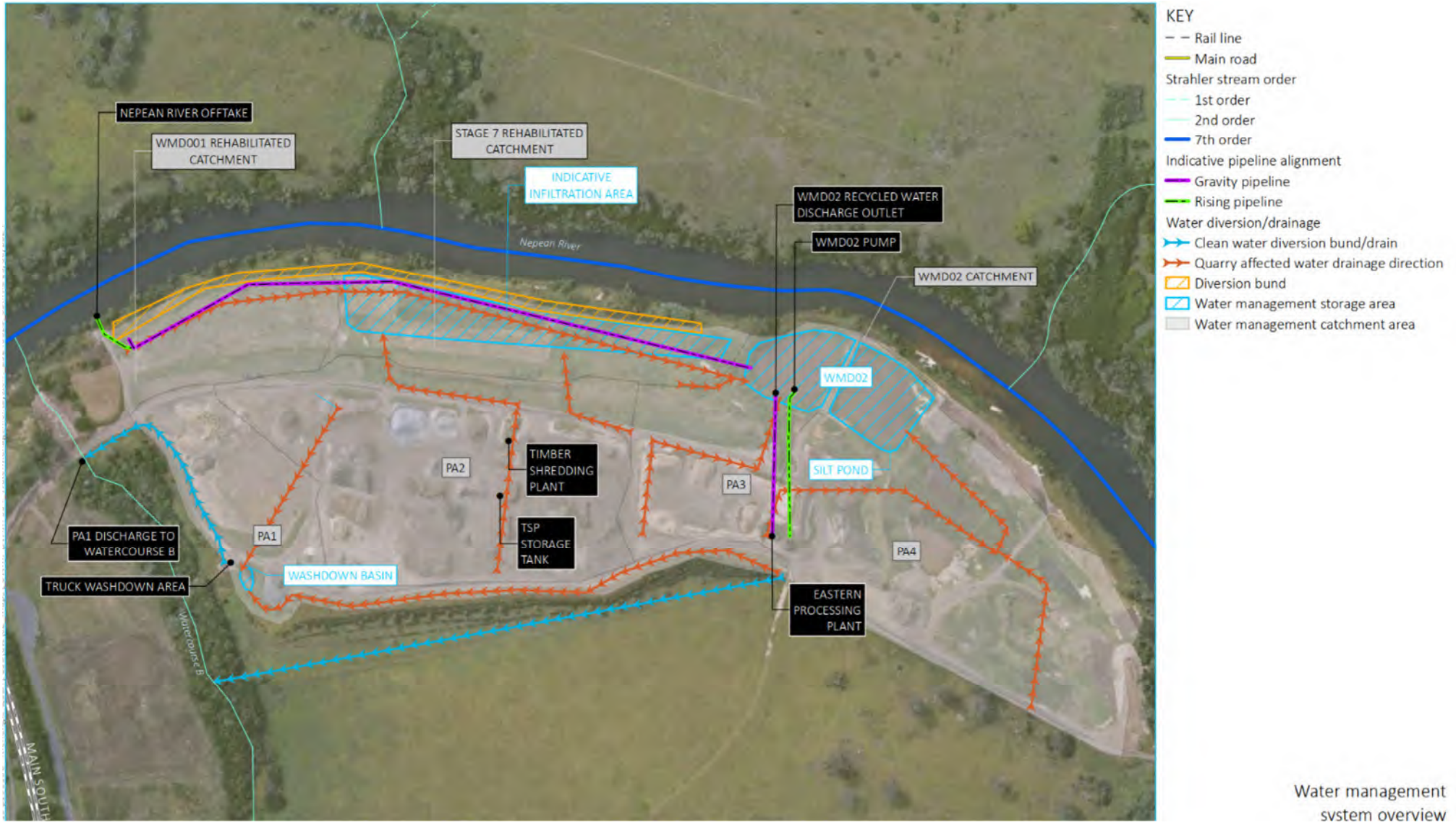


Table 3-2 Description of Water Management System (Source: Table 5.1, Ref [24])

Catchment	Area (ha)	Catchment use	Surface water management
Site entry	0.8	• Parking • Site offices • Site access road • Truck wheel wash • Maintenance shed • Laydown area • Internal roads	• Runoff from the catchment drains onto the adjoining grassed area for infiltration. • Mains water is used to supply the site offices and truck wheel wash. • Water used in the truck wheel wash is recycled through a concrete sump pond resulting in a relatively small net water demand. • The internal roads are watered to minimise dust generation.
PA1	2.5	• Material stockpiling • Haul roads • Truck washdown	• Clean water diversion bund diverts runoff from upstream catchment into Watercourse B. • Runoff from the catchment drains to Watercourse B via culvert beneath haul road.
PA2	5.2	• Material processing and wash • Material stockpiling • Haul roads • Timber shredding plant (TSP) • Historical (Stage 7) extraction area	• Clean water diversion bund diverts runoff from upstream catchment into Watercourse B. • Runoff from the catchment drains to the historical Stage 7 extraction area for infiltration and evaporation. • Water used for material washing is recycled through two coarse-sediment settling ponds prior to discharging to WMD01 for re-use.
PA3	2.4	• Material processing and wash • Material stockpiling • Haul roads	• Clean water diversion bund diverts runoff from a portion of the upstream to Watercourse B. • Runoff from catchment and drains to Silt Pond. The Silt Pond requires a total basin volume of 4,518 m^3. • Water Management Dam (WMD) 02 is used to store water extracted from the Nepean River prior to use for dust suppression, truck washdown, and washing of material. WMD02 requires a total basin volume of 1,886 m^3.
PA4	5.8	• Material stockpiling	• Runoff from catchment and drains to Silt Pond.
Typical Stage 8 cell	0.33[1]	• Active extraction area • Haul roads	• Temporary sedimentation basin(s) will be constructed in extraction area to capture quarry affected water runoff prior to infiltration. No water will be extracted from the sedimentation basin.

1. Advancing progressively.

Surface water controls are described by the SWMP[12] as including:

- Water storages: The quarry has two existing water management dams (WMD02 and Silt Pond) that are used for water supply and to capture quarry affected runoff from the existing processing area. The historical Stage 7 extraction area (WMD03) is also used to capture quarry affected runoff from the existing processing area prior to infiltration and evaporation. While the historical Stage 7 extraction area is not a formal water storage, a detention function is provided as a result of the embankment associated with the Stage 7 Nepean River setback contour. A sedimentation basin(s) will be constructed to capture quarry affected runoff from the active Stage 8 extraction area. The location of the sedimentation basin will move as quarrying progresses.

[12] Section 5.2, EMM (9 September 2024)

- Clean water management: Clean water diversions are used at the quarry to intercept runoff from upstream catchments prior to it entering disturbed areas. There is a large vegetated clean water diversion bund on the southern side of the processing area which diverts upstream runoff to west and into Watercourse B. Clean water diversions are also used to direct runoff around the existing site entrance compound and into Watercourse A.

  There is limited opportunity to divert clean water away from the Stage 8 extraction areas due to topography and extent of native vegetation required to establish diversion drains. Further, unnecessary concentration of flow increases the erosion potential of runoff and may encourage the dispersal of weed seeds from the upstream catchments into rehabilitation and biodiversity restoration areas. As such, the sedimentation basin will be sized for both the contributing exposed and clean run-on water catchments.

  The extraction area will be separated from the Nepean River by the combined Nepean River Buffer Zone (10 m to 17 m wide horizontally) and the lower riverbank that will remain in situ. Due to the permeable nature of the soils being extracted in Stage 8, runoff is expected to be minimal with the majority of rainfall infiltrating into the underlying soil. As has been found to be the case during quarry operations over the last 30 years.

- Quarry affected water management: Quarry-affected runoff from most of the processing area is managed within the water management dams and the historical Stage 7 extraction area. The water management system redirects quarry-affected runoff from to the Silt Pond and WMD02. The water management dams, and historical Stage 7 extraction area provide the primary erosion and sediment control function for the processing area. Quarry-affected runoff that is captured in the water management dams is extracted for dust suppression and for use in the processing area. The runoff that drains to the historical Stage 7 extraction area is either evaporated or infiltrated into the underlying alluvium. The re-use and infiltration of quarry affected water minimises the potential for this water to discharge into the Nepean River.

  Quarry-affected runoff from the site entrance compound and access road drains to an adjacent vegetated buffer for infiltration. In higher runoff events, the vegetated buffer provides a treatment function prior to runoff entering the Nepean River. Extraction and restoration activities within the Stage 8 area have been designed to prevent quarry-affected surface water entering the Nepean River.

  Water management measures will be implemented within the Stage 8 extraction area to capture and treat quarry affected runoff from the active extraction area. An adaptive approach to erosion and sediment control will be implemented to account for the constantly progressing quarry footprint.

  Site sediments are generally coarse, and low in clay, and as such that sediment-laden water within the basin(s) are not expected to require treatment with coagulants or flocculants. The optimal locations for sedimentation basins and diversion bunds/swales will be determined as the active extraction area progresses. The construction of these controls will be timed so that previously installed controls remain effective until the new controls are fully functional. Redundant controls will be removed/rehabilitated when they are no longer required to divert clean water or capture quarry-affected water. Erosion and sediment control measures will be regularly reviewed and maintained. Quarrying methods aimed at reducing the risk of erosion and sedimentation during a Nepean River flood event are described in the Flood Management Plan (**FMP**).

- Spill management: As described in the quarry's Pollution Incident Response Management Plan (**PIRMP**), all stored hydrocarbons (fuel) that could potentially contaminate the soil are

stored in bunded facilities. Any spill would be contained within the bunded area preventing it from dispersing beyond immediate surrounds of the containment area. Bunded areas are inspected regularly to ensure they are free of debris, spills or water to enable maximum capacity to capture any potential spills. Spill containment kits are maintained in place at each bunded area and at other locations where the potential for chemical spills exists (e.g. workshop area).

The potential for spills will be minimised by: inspecting incoming waste for liquids; re-fuelling operations of plant to be undertaken by suitably trained personnel; and, provision of spill kits and training of personnel in their use.

However, in case a hydrocarbon spill (i.e. a burst hydraulic hose or spill during refuelling) occurs during refuelling, a spill kit will be stored on the refuelling vehicle and will be available during all refuelling. If a spill occurs it will be immediately cleaned up following the identification of the incident. Any soils contaminated by hydrocarbons will be excavated and disposed off-site at a facility licenced to accept contaminated soils. The clean-up and treatment of spills will be managed under the PIRMP.

- Preparation of annual site water balance: A site water balance will be prepared annually to document site water use and compliance with water licencing requirements. The water balance will include annual estimates of:
  - Runoff volume harvested by the water management dams using: (i) annual rainfall totals at BoM operated Menangle Bridge (Nepean River) rainfall gauge (or another appropriate gauge as necessary); (ii) appropriate hydrological assumptions for the contributing water management catchments;
  - Evaporation total based on nearest BoM operated evaporation gauge or Silo Patched Data for the site;
  - Net process water use including water lost in product; and
  - Water sourced from the Nepean River.

  An estimate of annual groundwater inflows to the active Stage 8 extraction area will also be provided. The results of the annual site water balance will be reported in the Menangle Sand and Soil Quarry Annual Review.
- Surface Water Trigger Action Response Plan: Exceedances in surface water quality measured by the monitoring program will be addressed in accordance with the trigger action response plan (**TARP**) provided in **Table 3-3**. The plan will be refined in future years as more site-specific surface water data are obtained.

Table 3-3 Surface Water TARP (Source: Table 5.8, Ref [24])

Trigger	Action required	Timing	Follow up actions
Discharges			
Unanticipated overflows from the water management system to the Nepean River.	Implement immediate actions to stop, or if not immediately possible, control the discharge.	Immediate.	The notification and report will provide the information required by Consent conditions D7 and D8 as described in EMS Section 8.2.2. As well as the information required for all incidents (see EMS Section 8.2.2), the report will include the following information: 1. location of overflow event 2. time at which overflow event commenced 3. time at which overflow event ceased 4. duration of the overflow event 5. estimated volume of overflow.
	Any unanticipated quarry-affected water overflows that is classified as an 'incident', i.e. causes or threatens to cause material harm, will be notified to DPHI and EPA and an incident report will be sent to DPHI and EPA.	Immediate notification (see EMS Section 8.3.2i). Written incident notification within 7 days (see EMS Section 8.3.2ii). Incident report within 30 days (see EMS Section 8.3.2iii).	
	All other unanticipated quarry-affected water overflows to the Nepean River will be reported to DPHI and EPA within 7 days of the overflow occurring.	Written incident notification within 7 days (see EMS Section 8.3.2ii).	
	Collect water samples upstream and downstream of the Stage 8 area at NR20 and NR50 (see Figure 5.7) and analyse for parameters listed in Table 5.6.	Sampling within 24 hours of overflow identification.	Determine if results at NR20 outside of trigger values provided in Table 5.7 (i.e. 'an exceedance'). If there is an exceedance: • If the source of exceedance is determined not to be associated with quarry operations, no other further action is required. • If the source of exceedance is undetermined or identified as potentially due to quarry activities, the exceedance is to be reported to DPHI and EPA if it is classified as an incident (see EMS Section 8.3.2i).

Table 3-3 (cont'd) Surface Water TARP

Trigger	Action required	Timing	Follow up actions
Water quality			
Concentration of physical parameters within temporary sedimentation basin outside of trigger values provided in Table 5.7.	Investigate potential cause of exceedance and whether impacts to receiving environment are expected. Inspect the sedimentation basin catchment to identify contributing contaminant sources and remove these sources if possible.	Remove/control identified contaminant sources, if possible, as soon as practicable. Immediate notification of DPHI and EPA if it is classified as an incident (see EMS Section 8.3.2i).	Document outcomes of investigation and any mitigation/management measures implemented in Annual Review.
Concentration of physical parameters at downstream Nepean River monitoring site (NR20) outside of trigger values provided in Table 5.7.	Identify if exceedance is naturally occurring or due to the quarrying operation by reviewing: 1. upstream sample location data to determine if exceedance is naturally occurring 2. baseline sampling data to determine if similar exceedances are known to occur 3. sedimentation basin monitoring data to determine if similar exceedance occur. Inspect the quarry to identify contributing contaminant sources and remove these sources if possible.	Remove/control identified contaminant sources, if possible, as soon as practicable. Immediate notification of DPHI and EPA if it is classified as an incident (see EMS Section 8.3.2i).	If the source of exceedance is determined not to be associated with quarry operations, no other further action is required. If the source of exceedance is undetermined or identified as potentially due to quarry activities, the exceedance is to be noted in database for consideration in future monitoring rounds. If ongoing (2 out of 3 consecutive monitoring rounds). water quality anomalies are detected at downstream Nepean River monitoring site, advise DPHI and EPA.

3.4.4 Groundwater Quality

In terms of groundwater quality, the MOD 2 Consent required that the SWMP also included a groundwater management plan approved by DPHI (Conditions B36 – B39).

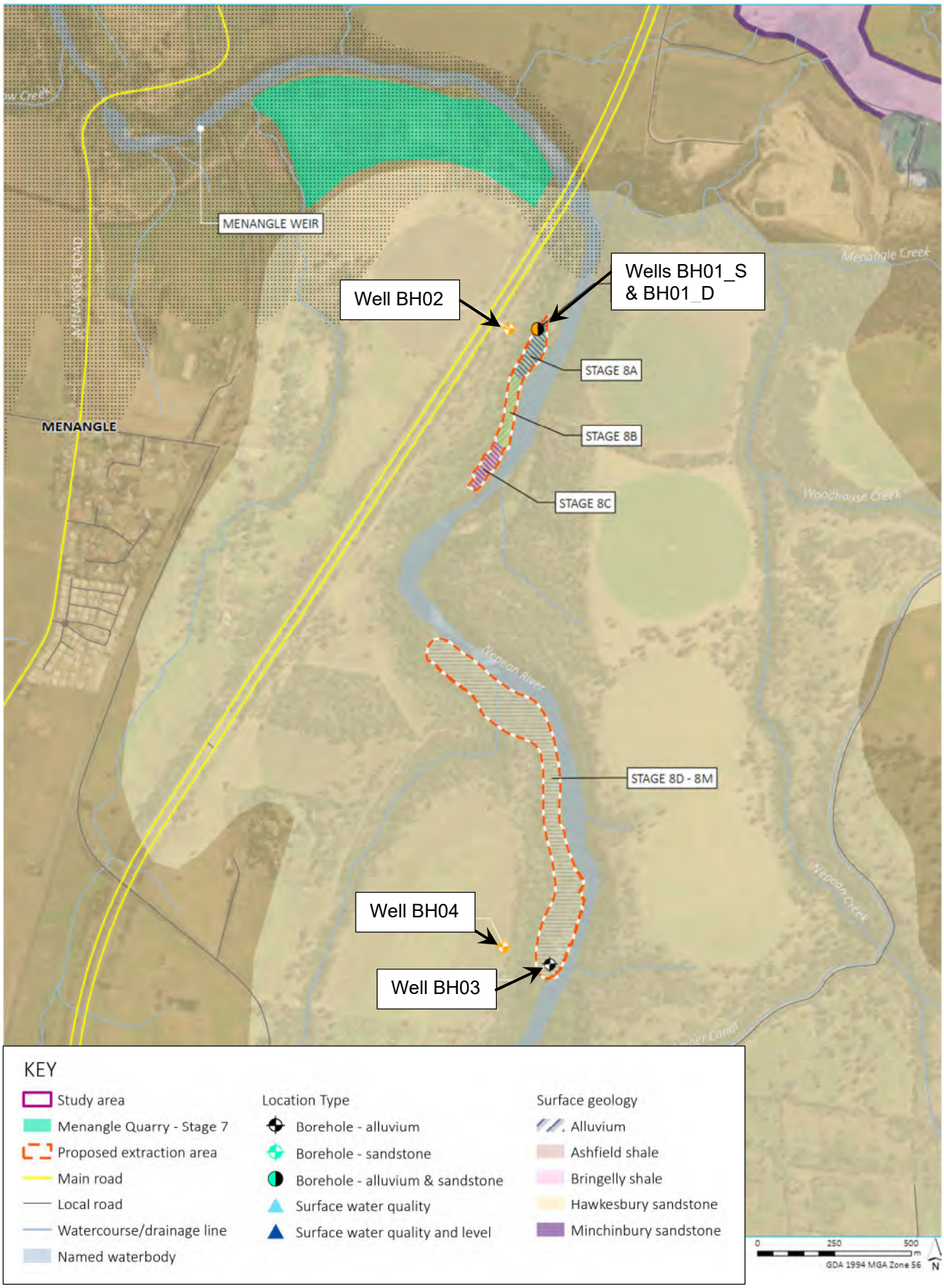
The first version of the SWMP was issued on 24 March 2021. Version 3 dated 25 February 2022 addressed the requirements specified in the MOD 2 Consent. The current version 5 is dated 9 September 2024 (Ref [24]). The current version of the SWMP was approved by DPHI on 20 September 2024.

Monitoring – Pre-2023

The SWMP[13] advised that one groundwater monitoring event (**GME**) was undertaken within the future Stage 8 extraction area between 29 May and 2 June 2020 using five bores (BH01_S, BH01_D, BH02, BH03 and BH04) at the locations shown in **Figure 3-4**.

[13] Section 6.3.2, EMM (9 September 2024)

Figure 3-4 Groundwater Monitoring Bores (Source: Figure 6.1, Ref [24])



The results of the GME were documented in the SWMP and represented baseline conditions. The pH and EC results showed:

- Alluvial aquifer (BH01_S & BH03): pH 6.45 - 7.65 and EC 1,194 – 2,640 µS/cm
- Hawkesbury Sandstone aquifer (BH01_D, BH02, BH04): pH 6.85 – 8.43 and EC 2,730 – 12,000 µS/cm
- Nepean River (Sites 1 & 2): pH 7.22 - 7.88 and EC 195 – 308 µS/cm

Monitoring - 2023

A second GME was undertaken by EMM on 20 January 2023 at the five bores together with one surface water sample, with the results documented in an EMM report dated 27 February 2023 (Ref [7]). At the time of the fieldwork, quarrying activities were not observed by EMM within the Stage 8 extraction area (refer **Figure 3-4**).

At each bore the monitoring event involved:

- Manual groundwater level measurement (dip) and download of automated groundwater level loggers;
- Measure physico-chemical parameters (temperature, pH, electrical conductivity (**EC**), total dissolved solids, reduction potential and dissolved oxygen) using a calibrated YSI water quality meter;
- Collect a water sample using a micro-purge low flow bladder pump; and
- Test the sample at a NATA-accredited laboratory for general water quality (pH, EC, total dissolved solids, hardness and alkalinity), major ions (calcium, chloride, fluoride, sodium, magnesium, potassium, sulphate, and an ionic balance), and dissolved metals (arsenic, cadmium, chromium, copper, nickel, lead, and zinc).

The results showed:

- Groundwater levels were continuously monitored in the five wells BH01-S, BH01-D, BH02, BH03 and BH04 between May 2020 and January 2023;
- Groundwater levels remained above the groundwater low level trigger values;
- EC levels in the two alluvium bores (BH01_S & BH03) were within the lower and upper trigger limits of 125 µS/cm and 2,500 µS/cm, respectively; and
- Groundwater is typically acidic due to natural conditions within the Hawksbury Sandstone, with all field pH measurements in alluvium below the lower limit trigger level of 6.5 ranging between 4.37 (BH01_S) and 4.91 (BH03). Laboratory pH values were less acidic.

A summary of the EC and pH data measured by the 20/01/23 GME is provided in **Table 3-4**.

The EMM report recommended that groundwater quality continue to be monitored and assessed in Stage 8.

Table 3-4 Groundwater pH and EC 20/01/23 GME Data (Source: Table 2.2, Ref [7])

Site ID	Screened lithology	EC trigger value[1] (µS/cm)		EC January 2022 (µS/cm)		pH trigger value		pH January 2022	
		Lower limit	Upper limit	Field	Laboratory	Lower limit	Upper limit	Field	Laboratory
BH01_S	Alluvium	125	2,500	390	505	6.5	8.0	**4.37**	**5.77**
BH01_D	Hawkesbury Sandstone	125	3,000	730	922	6.5	8.0	**5.52**	6.70
BH02	Hawkesbury Sandstone	125	10,000	7,404	9,200	6.5	8.5	**6.01**	6.76
BH03	Alluvium	125	2,500	1,690	2,080	6.5	8.0	**4.91**	**6.10**
BH04	Hawkesbury Sandstone	125	12,000	8,960	11,300	6.5	8.5	**6.31**	7.29

Notes: 1. (EMM, 2021a)

Bold font depicts a trigger value exceedance.

Monitoring – 2024

A third GME was undertaken by EMM on 10 April 2024 at the five bores together with one surface water sample, with the results documented in an EMM report dated 2 May 2024 (Ref [16]). At the time of the fieldwork, EMM observed quarrying activities within the Stage 8A–C extraction areas (refer **Figure 3-4**).

At each bore the monitoring event involved:

- Manual groundwater level measurement (dip) and download of automated groundwater level loggers;
- Measure physicochemical parameters (temperature, pH, EC, total dissolved solids, reduction potential and dissolved oxygen) using a calibrated YSI water quality meter;
- Collect a water sample using a micro-purge low flow bladder pump; and
- Test the sample at a NATA-accredited laboratory for general water quality (pH, EC, total dissolved solids, hardness and alkalinity), major ions (calcium, chloride, fluoride, sodium, magnesium, potassium, sulphate, and an ionic balance), and dissolved metals (arsenic, cadmium, chromium, copper, nickel, lead, and zinc).

The results showed:

- Groundwater levels were continuously monitored in well BH01-D and BH02 between May 2020 and April 2024. Logger data was unable to be downloaded from BH03 and BH01_S due to logger fault. Logger data is available until 12 January 2024 at BH01_S and the 10 January 2023 at BH03. Erroneous data was recorded in BH04 between 12 January 2024 to 10 April 2024, when issues were corrected. Data from this period were not included in the hydrographs;

- Groundwater levels remained above the groundwater low level trigger values;
- EC levels in the two alluvium bores (BH01_S & BH03) were within the lower and upper trigger limits of 125 µS/cm and 2,500 µS/cm, respectively;
- Groundwater is typically acidic due to natural conditions within the Hawksbury Sandstone, with all field pH measurements in alluvium below the lower limit trigger level of 6.5 ranging between 4.25 (BH01_S) and 4.03 (BH03). Laboratory pH values were less acidic; and
- The qroundwater quality results measured on 10/04/24 were similar to those measured on 20/01/23.

A summary of the EC and pH data measured by the 20/01/23 GME is provided in **Table 3-5**.

Table 3-5 Groundwater pH and EC 10/04/24 GME Data (Source: Table 1.2, Ref [16])

Site ID	Screened lithology	EC trigger value[1] (µS/cm)		EC April 2024 (µS/cm)		pH trigger value		pH April 2024	
		Lower limit	Upper limit	Field	Laboratory	Lower limit	Upper limit	Field	Laboratory
BH01_S	Alluvium	125	2,500	367	326	6.5	8.0	4.25	4.64
BH01_D	Hawkesbury Sandstone	125	3,000	542	993	6.5	8.0	4.94	5.49
BH02	Hawkesbury Sandstone	125	10,000	9,115	9,070	6.5	8.5	5.01	5.48
BH03	Alluvium	125	2,500	1,261	1,210	6.5	8.0	4.03	4.60
BH04	Hawkesbury Sandstone	125	12,000	8,441	8,330	6.5	8.5	5.26	5.70

EC = Electrical conductivity and µS/cm is microsiemens per centimetre.

Mitigation Measures

The SWMP[14] advised that as the Menangle Quarry will not intercept groundwater during its normal extraction operations, it is considered highly unlikely that the quarry will alter groundwater levels or quality. Despite this, potential changes in groundwater conditions will be assessed as part of the groundwater monitoring program. If a change is detected that may be because of an unforeseen impact caused by the quarry operation, the Groundwater TARP will be initiated, which is detailed in **Table 3-6**.

[14] Section 6.6, EMM (9 September 2024)

Table 3-6 Groundwater TARP (Source: Table 6.6, Ref [24])

Trigger value or level indicating potential impact	Action required	Timing	Any follow up actions
Water level			
Water levels in the groundwater monitoring bores decrease below the trigger levels provided in Table 6.4.	Continue to monitor and assess water level data, establish trends and correlate with quarrying activities and climatic data (rainfall). Apply statistical analysis to assess trends if required. Determine whether any decrease in water level may be due to impacts from the quarry. Calculate and assess any distance drawdown effects with respect to any neighbouring water users (bores). Notify relevant neighbouring water users owners if a drawdown of more than 2 m is predicted in a bore they own. Notify DPHI and NSW DCCEEW-Water Group that relevant neighbouring water users owners have been notified.	Quarterly based on groundwater logger downloads	If some, or all of the water level declines in the monitoring bore network are assessed to be due to impacts from quarrying at Menangle and distance drawdown calculations by the hydrogeological consultant (in consultation with the NSW DCCEEW-Water Group) indicate a 'significant' (i.e. greater than 2 m decline in accordance with the NSW *Aquifer Interference Policy*) impact on neighbouring water users (bores), access to the potentially affected bore/s should be requested in order to confirm and monitor any impact that may be solely or partly due to quarrying at Menangle. If a 'significant' impact on a neighbouring water user is scientifically demonstrated, make good arrangements may be implemented in consultation with the affected water user.
The water table measured in temporary bores installed within the extraction areas increases to within 1 m of the pit floor level.	Quarry manager to review pit floor/extraction levels to ensure a 1 m buffer is maintained.	Monitoring twice a day for seven days following installation Daily during extraction	Continue to monitor temporary bores to further assess fluctuations in the local water table.
Water quality			
Concentration of physical parameters increases outside the ranges of trigger levels as stated in Table 6.5.	Continue to monitor and assess groundwater quality data, establish trends and correlate with quarrying activities and climatic data to determine a causal link (if any) with Menangle quarrying operations.	Annual	If evolving geochemical anomalies are detected in groundwater sampled from the wider monitoring bore network and an impact from the quarrying on the 'regional' sandstone aquifer system is demonstrated, advise NSW DCCEEW-Water Group for further action.
Unanticipated groundwater inflow into the pit	All unanticipated groundwater inflow into the pit will be reported to DPHI and NSW DCCEEW-Water Group within 7 days of the commencement of inflow.	Event based	A report to NSW DCCEEW-Water Group will be prepared that includes the following information: 1. time at which inflow event commenced 2. time at which inflow event ceased 3. duration of the inflow event 4. volume of groundwater inflow extraction area floor elevation at which the inflow event occurred

Table 3-6 (cont'd) Groundwater TARP

Trigger value or level indicating potential impact	Action required	Timing	Any follow up actions
Groundwater inflow greater than the licence exemption volume (3 ML/year).	If there are more than 5 high flow events at Menangle Weir (with river levels above 62 mAHD but not greater than 64 mAHD) in a year, the groundwater model will be used to predict the peak annual inflow over the year (see Section 2.3.2). DPHI and NSW DCCEEW-Water Group will be notified within 7 days of the determining that inflow into the pit will exceed 3 ML/year.	Annual	Obtain water access license share entitlements for the Sydney Basin Nepean Groundwater Source if inflow to the pit exceeds 3 ML/year.

The second and third GMEs conducted on 20/01/23 and 10/04/24 measured pH levels outside the trigger levels (i.e. more acidic). Consequently, part of the Groundwater TARP needs to be implemented, involving:

- Action required: Continue to monitor and assess groundwater quality data, establish trends and correlate with quarrying activities and climatic data to determine a causal link (if any) with Menangle quarrying operations.
- Timing: Annual.
- Any follow up actions: If evolving geochemical anomalies are detected in groundwater sampled from the wider monitoring bore network and an impact from the quarrying on the 'regional' sandstone aquifer system is demonstrated, advise NSW EPA Water Group for further action.

The SWMP (Section 6.8) also advises that if groundwater trigger values are exceeded, DPHI, NSW EPA-Water Group and relevant stakeholders will be notified.

Specific groundwater-related measures and requirements to meet the objectives of this SWMP and to address potential impacts on groundwater are outlined in **Table 3-7**.

Table 3-7 Groundwater Mitigation Measures (Source: Table 6.7, Ref [24])

Measure/requirement	When to implement	Responsibility	Reference
A spill kit will be available during refuelling. Diesel and other contaminant spills will be cleaned up immediately. Appropriate action will be taken to notify the appropriate regulatory authorities and report the incident in accordance with the requirements of the quarry's EMS.	Throughout Stage 8 quarry operation	All quarry staff	Consent Condition B18
Groundwater levels at BH01_S, BH01_D, BH02, BH03 and BH04 will be monitored using continuous data loggers.	Throughout Stage 8 quarry operation	Quarry manager	Consent Condition B19
Exclusion fencing and signage will be installed around at BH01_S, BH01_D and BH02.	Prior to commencement of operation at Stage 8 extraction areas	Quarry manager	Consent conditions B20 and B36(c)(iii)
Groundwater quality samples will be collected annually from BH01_S, BH01_D, BH02, BH03 and BH04 and analysed for all major anions and cations and field parameters.	Throughout Stage 8 quarry operation	Quarry manager	Consent Condition B21
Temporary bores will be installed progressively in Stage 8 extraction area to determine the local water table position. Groundwater level will be measured twice-daily in the temporary bores using an electronic dip meter over a period of seven days.	Immediately prior to commencement of operation at each of Stage 8 extraction areas	Quarry manager	Consent conditions B22 and B36(c)(iii)
The pit floor in the Stage 8 area will remain at least 1 metre above the measured water table level averaged over the seven-day monitoring period.	Throughout Stage 8 quarry operation	Quarry manager	Consent conditions B22 and B36(c)(iii)
A Modflow groundwater model will be developed and updated to quantify the progressive takes from water sources during Quarrying Operations in the Stage 8 area in accordance with Consent conditions B24, B25 and B26.	Model prepared (see Section 6.2 and Appendix D)	Quarry manager	Consent conditions B24, B25 and B26.
If there are more than 5 high flow events at Menangle Weir (with river levels above 62 mAHD but not greater than 64 mAHD) in a year, the groundwater model will be used to predict the peak annual inflow over the year.	Annual	Quarry manager	Consent conditions B27 and B29
All necessary Water Access Licences (WALs) and licence shares for the operation of the quarry under the *Water Act 1912* and/or the *Water Management Act 2000* will be obtained.	If the groundwater model indicates that net groundwater inflow into the pit exceeds 3 ML/year	Quarry manager	Consent conditions B27 and B29
Report on any water captured, intercepted or extracted from the site each year (directly and indirectly) in the Annual Review, including water taken under each WAL as applicable.	Throughout Stage 8 quarry operation	Quarry manager	Consent Condition B30

3.4.5 Erosion and Sediment Control

In terms of erosion and sediment control, the MOD 2 Consent required that:

- Suitable erosion and sediment control measures needed to be installed and maintained in the Stage 8 Area (Condition B31); and
- These measures must be detailed in the SWMP (Condition B31).

The SWMP[15] provided erosion and sediment control measures for the Stage 8 operation. These comprised:

- Employment of a full time rehabilitation officer. The Rehabilitation Officer will be onsite every working day that the quarry is operating, implementing the erosion control, soil stabilisation and rehabilitation measures described in the SWMP. The officer is to ensure that disturbed areas are stabilised as soon as possible, initially applying temporary measures if required, such as sowing a cover crop, and then applying permanent measures such as establishment of native vegetation. The measures will be implemented progressively, targeting small areas as soon as they are available rather than undertaking these works in larger areas on a less frequent 'campaign' basis. The officer will regularly inspect the success, or otherwise, of the measures implemented and will adjust the application of these measures accordingly.
- Appropriately integrated quarry design with site constraints: The quarry has been designed, constructed and rehabilitated so that the landform generally blends with the surrounding topography to generally avoid significant modification to landforms. The exception is the noise/visual bund surrounding the processing area. Previously extracted areas have been recontoured so that they resemble the pre-disturbance landform. This practice will continue in the Stage 8 area.

  The Stage 8 extraction area will generally result in an overall lowering of the alluvial benches to 64 m AHD with final batters 1(v):5(h) on the river side and up to 1(v):1(h) on the landward side (although natural sandstone faces may be steeper, up to vertical or overhanging). The extraction works will not result in the disturbance of electrochemically unstable soils.
- Minimising the extent and duration of land disturbance: These measures include:
  - Menangle Sand and Soil will implement an internal Land Disturbance Permit process to ensure unnecessary land disturbance does not occur. Location-specific environmental, drainage and erosion and sediment controls will be planned and implemented as required;
  - Protected vegetation is identified in the quarry's BRMP. Clearing limits will be clearly demarcated using barrier mesh, bunting or some other appropriate high visibility material;
  - Initial clearing and stripping works will be scheduled to avoid high rainfall erosivity periods, where practical, to minimise erosion. Where major land disturbing works need to occur in a high rainfall erosivity period, there will be an appropriate increase in the levels of control measures, such as having available rolled erosion control products, to compensate for the increased erosion risk; and
  - Progressive stabilisation and rehabilitation of disturbed areas is fundamental to successful erosion and sediment control to prevent turbid runoff and subsequent sedimentation. Only two substages will only be active at any time. The active extraction area will be no greater than 0.33 ha.

[15] Sections 7.2 & 8, EMM (9/09/24)

- Controlling water movement through the site: These measures include:
  - The passage of clean water running on to previously extracted areas and the infrastructure areas is generally via ephemeral waterways. Clean water is diverted around the processing area via a diversion bund (noise/visual bund);
  - A trafficable inclined diversion bank will be installed on the eastern side of Watercourse B to ensure all potentially turbid runoff from this area is diverted away from Watercourse B to WMD02;
  - Pipe culverts are installed on all waterway crossings;
  - There is limited opportunity to divert clean water around the Stage 8 extraction area due to topography and existing native vegetation that is to be retained. Further, the diversion of clean water could potentially lead to the dispersal of weed seeds to rehabilitation and biodiversity restoration areas. Erosion hazard for non-cohesive sandy and silty soils will be reduced by maintaining sheet-flow conditions instead of concentrating flows in diversion drains;
  - Rainfall falling onto the roofs of offices and workshop facilities is considered to be clean water. Roof runoff is captured using gutters and stored in tanks for re-use and overflows directed away from active exposed areas; and
  - Fuel storages are bunded.
- Minimise soil erosion: These measures are summarised in **Table 3-8**. Energy dissipaters will be used at the outlets of drains and spillways to reduce flow velocities to less than the maximum permissible velocity for the soil type.

Table 3-8 Types of Erosion & Applicable Mitigation Measures (Source: Table 7.6, Ref [24])

Types of erosion	Mitigation measures
Raindrop splash and sheet erosion	Effectively controlled by providing soil surface cover which can be achieved by: • minimising the extent and duration of soil disturbance • retaining vegetation and other soil surface cover (e.g. timber debris) and respreading as part of rehabilitation and restoration works • progressively rehabilitating disturbed areas • covering and binding exposed soils (see Section 7.2.6).
Rill erosion	Effectively controlled by minimising slope length and gradient which can be achieved by: • minimising disturbance of steeply grading areas where possible • reducing slope gradient and length • minimising concentration of flow • progressively revegetating disturbed areas.
Gully, creek bed and bank erosion	Effectively controlled by minimising the concentration of flow and slowing flow velocity which can be achieved by: • maintaining sheet-flow where possible • lining drains and installing grade control measures in waterways where flow velocities exceed the maximum permissible velocity of the soil (temporary and permanent).

- Promptly stabilising disturbed areas: Progressive stabilisation and rehabilitation of disturbed areas will be undertaken to minimise erosion and the generation of sediment and turbid runoff. Stabilisation methods will be selected based on variables including the specific location, the slope gradient and length, proximity to the Nepean River, time of year, surrounding vegetation (weed-infested versus self-sustaining native vegetation) and the final rehabilitation objectives as described in the BRMP. Stabilisation methods are expected to include one or more of the following:
  - Sowing a cover crop along with seeding with the desired native tree and bush species;
  - Applying polymer soil stabiliser;
  - Slope reduction;
  - Spreading timber debris (in accordance with Consent Condition B78);
  - Permanent revegetation with native vegetation;
  - Applying straw based hydromulch / hydraulically applied growth medium (HGM); and/or
  - Rock mulching.
- Maximise sediment retention: These measures include:
  - Sedimentation basins have been, and will continue to be constructed, to contain and treat sediment laden runoff from the disturbed areas, including the processing area and the Stage 8 area;
  - Silt Pond and WMD02 are permanent water management dams that will remain until processing operations have been completed. These dams have been sized to contain the 95th percentile 5-day rainfall depth with the sediment storage zone 50% of the volume of the settlement zone in accordance with Table 6.1 of NSW EPA (2008) for basins with a design life of greater than 3 years in a sensitive environment;
  - The first basin in the Stage 8 area will be constructed at the northern end of Stage 8A and will be progressively moved south as extraction progresses from the north to south; and
  - Sedimentation basins in the Stage 8 area will be sized in accordance with Landcom (2004) for a Type D soil. The required sedimentation basin size will vary as quarrying progresses due to changes in the upstream clean water run-on catchment. The basins will be sized to contain the 85th percentile 5-day rainfall depth with the sediment storage zone 50% of the volume of the settlement zone in accordance with Table 6.1 of NSW EPA (2008) for basins with a design life of 6 to 12 months in a sensitive environment. Indicative basin sizes for a typical Stage 8 area catchment as well as the maximum catchment expected to contribute to each substage area are provided in Table 7.7 of the SWMP.
- Maintain drainage, erosion and sediment control measures: Drainage, erosion and sediment control measures will be maintained at all times until their function is no longer required. Technical notes for drainage, erosion and sediment control measures are available from both Landcom (2004) and the International Erosion Control Association Australia's websites. These technical notes include the construction and maintenance requirements for the control measures. Controls will be inspected following rainfall that causes runoff or monthly during dry conditions. Inspections will be undertaken by the Quarry Manager. Menangle Sand and Soil will maintain control measures to maximum practicable extent. All natural debris and sediment removed from control measures will be transported to the processing area and

incorporated into blended quarry products or will be placed into the base of a completed extraction area in a manner that will not create an erosion or pollution hazard. Any contaminated material will be removed from site for disposal at an appropriately-licenced facility.

- Monitor and adjust drainage, erosion and sediment control practices to achieve desired performance standard: Erosion and sediment controls will be progressively installed in the Stage 8 area as the active extraction area advances. The construction of these controls will be timed so that previously installed controls remain effective until the new controls are fully functional. Redundant controls will be removed/rehabilitated when they are no longer required to divert clean water or capture quarry-affected water. If an inspection or environmental monitoring identifies a significant failure of the adopted drainage, erosion and sediment control measures, a critical evaluation of the failure will be undertaken to determine the cause and appropriate modifications made to the control measures on site and the SWMP amended if required.
- Drainage, erosion and sediment control competence: Quarry personnel, including contractors, will have an appropriate level of drainage, erosion and sediment training. Two levels of competency training for personnel are recommended:
  - Level 1 – basic awareness level training provided during the site induction.
  - Level 2 – detailed training course where drainage, erosion and sediment control is a regular component of their daily activities and competence is required.
- Erosion and sediment controls in each quarry area: A range of erosion and sediment control measures will be applied to each quarry area. The quarry will employ a full-time Rehabilitation Officer, who will apply a combination (one or more) of the erosion and sediment controls provided in Tables 7.8 to 7.11 in the SWMP based on an assessment of the specific location within each quarry area:
  - site entry compound: office, parking, workshop and laydown areas;
  - processing area;
  - Stage 8 extraction area; and
  - Access track and haul road.
- Inspection and maintenance: These measures include:
  - All incidents will be reported and investigated, and corrective actions assigned to prevent future occurrences;
  - An incident may involve any action or activity deemed to be in non-compliance with this SWMP as well as actual or potential Material or Serious Environmental Harm;
  - All incident reporting will be undertaken in accordance with the procedures detailed in the EMS;
  - Inspections of drainage, erosion and sediment control measures will be undertaken weekly during normal operations hours; daily during periods of rainfall; within 12 hours of the cessation of a rainfall event (greater than 10 mm) causing runoff to occur on, or from, the quarry;
  - Inspections will be undertaken by the Quarry Manager;

- A range of drainage, erosion and sediment control measures will be implemented within the quarry. A summary of the maintenance and remedial actions for these control measures is provided in Table 8.1 of the SWMP; and
- The Quarry Manager will monitor weather forecasts daily. Where the forecasts indicate that there is a greater than 60% chance of more than 10 mm of predicted rainfall, the Quarry Manager implement and the wet weather procedures.

3.4.6 Flood Management

In terms of flood management, the MOD 2 Consent required that:

- A FMP be prepared and approved by DPHI (Condition B32); and
- The management procedures specified in the approved FMP needed to be implemented (Conditions B33 – B35).

A FMP was prepared by EMM dated 25 February 2022 (Ref 5) and approved by DPHI on 25 October 2022. The objectives specified by the FMP are to:

- Describe how flood emergency response will be managed for the active extraction area, processing area and site entry compound;
- Ensure the safety of site personnel by providing procedures to prepare / respond to flood events that may inundate the active extraction area, processing area and site entry compound;
- Ensure appropriate controls and procedures are implemented to minimise potential adverse impacts to the environment from flooding of the active extraction and processing areas; and
- Implement the flood management commitments made in the Menangle Quarry Extension Environmental Assessment, the Menangle Quarry Extension Response to Submissions, and as updated by further commitments made during the LEC Proceedings 342158 of 2018.

The FMP[16] provided flooding related measures and requirements to meet the objectives of the FMP and to address potential impacts resulting from flooding. The measures cover:

- General measures;
- Quarrying method;
- Monitoring for potential flood;
- Notifications;
- Actions prior to flooding;
- Evacuation; and
- Post flood event actions.

A summary of these measures is provided in **Table 3-9**.

[16] Section 5, EMM (25 February 2022)

Table 3-9 Summary of Flood Management Measures (Page 1 of 4) (Source: Table 5.1, Ref [5])

ID	Management measure/requirement	Implementation stage	Responsibility	Reference
General				
FM01	All quarry personnel will be provided with information and training regarding the importance of flood warning, flood action protocols and evacuation requirements.	Extraction and operation	Quarry Manager	-
FM02	Removal of quarrying infrastructure (where practical) and plant from flood prone areas in the event of a forecast flood to minimise the risk of damage to infrastructure/plant and the risk to downstream property.	Extraction and operation	Quarry Manager	-
Quarrying method				
FM03	The stage 8 extraction area is setback from the river a minimum of 10 m from the 64 m AHD contour leaving the Nepean River Buffer Zone and lower riverbank undisturbed. The setback will provide a buffer between flows in the main channel of the Nepean River and the excavation area during a flood.	Extraction	Quarry Manager	Consent Condition A10
FM04	The riverside batter is to be between the Nepean River Buffer Zone and the base of the pit. The following management measures apply to the riverside batter: • Constructed with a maximum slope of 1:1 during sand and soil extraction – this will allow the efficient extraction of the resource. • Following extraction, the riverside batter will be 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 or post extraction. • The maximum length of the riverside batter that has a slope between 1:1 and 1:5 will be restricted to 30 m at any one time to allow sufficient time to reshape batters prior to the occurrence of a flood event. 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 covered to form a 1:5 batter.	Extraction and post extraction	Quarry Manager	Consent Condition B32b(v) Consent Condition B32b(vii) Consent Condition B70
FM05	The quarry is anticipated to progressively advance upstream at an average rate of 150 m/year depending on customer demand and in-situ resource. The advancing quarry face will face downstream. A maximum batter angle of 1:2 is to be applied to the advancing face to minimise any scour occurring as the elevated floodwaters (if high enough) initially flow down the advancing face batter.	Extraction	Quarry Manager	-

Table 3-9 Summary of Flood Management Measures (Page 2 of 4) (Source: Table 5.1, Ref [5])

ID	Management measure/requirement	Implementation stage	Responsibility	Reference
FM06	The trailing quarry face will face upstream. A maximum landward batter angle of 1:5 will be applied for this face to minimise any scour occurring as elevated floodwaters initially move up the batter.	Extraction	Quarry Manager	Consent Condition B70
FM07	The landward batter is on the far side of the extraction area from the river. A landward batter angle of 1:1 is permitted as it will be exposed to lower flood current speeds and peak shear stress than the riverside batter. Natural sandstone faces may be steeper, up to vertical or overhanging.	Extraction	Quarry Manager	Consent Condition B70
FM08	The active extraction area in any Stage 8 subarea is not to exceed 0.33 ha at any one time to minimise the disturbance area that may contribute to the entrainment of in-situ materials in floodwaters should flooding occur.	Extraction	Quarry Manager	Consent Condition 32b(iv)
FM09	The final landform is to be vegetated and have a maximum permanent riverside batter slope of 1:5 and a maximum landward batter slope of 1:1 to minimise the risk of flood impacts of the rehabilitated landform.	Post extraction	Quarry Manager	Consent Condition B70
FM10	The final landform will not reduce flood storage within the Nepean River and overbank area as shown in Appendix E. Annual reporting of rehabilitation activities will include details of final landform in comparison to pre-existing landforms.	Post extraction	Quarry Manager	Consent Condition B35
Monitoring for potential flood				
FM11	Monitor BoM rainfall forecasts daily in dry weather and hourly during periods of heavy rain.	Extraction and operation	Quarry Manager	-
FM12	Monitor BoM flood warnings for the Nepean River daily in dry weather and hourly during periods of heavy rain.	Extraction and operation	Quarry Manager	-
Notifications				
FM13	Declaring the flood potential to quarry personnel and enacting the Trigger Action Response Plan (TARP).	When BoM website has a flood warning for the area or when the SES informs the quarry that flooding is predicted.	Quarry Manager	-

Table 3-9 Summary of Flood Management Measures (Page 3 of 4) (Source: Table 5.1, Ref [5])

ID	Management measure/requirement	Implementation stage	Responsibility	Reference
FM14	Declaring temporary cessation of quarry activities until flood risk has passed.	When BoM website has a flood warning for the area or when the SES informs the quarry that flooding is predicted.	Quarry Manager	-
FM15	Declaring the quarry reopened.	When SES have given the all clear or the river level is below 64 m AHD.	Quarry Manager	-
Actions prior to flooding				
FM16	The following actions will be taken when flooding of the Nepean River above 64 m AHD in the Stage 8 area is predicted: • any riverside batter that has a batter angle of less than 1:5 will be built up so that it has a maximum 1:5 slope; • exposed batters and the base of the pit will be flattened so that there are no isolated highpoints susceptible to scour; • all exposed sand and soil will be smoothed such that there are no rapid changes in slopes, particularly at the intersections of different batters; and • unattended earthmoving equipment will not be left below the 1% AEP level within the Stage 8 area while a flood warning is current.	When BoM website identify flood warning for the area or when the SES informs the quarry that flooding is predicted.	Quarry Manager	Consent Condition 32b(iii) Consent Condition 32b(v) Consent Condition 32c(i)
Evacuation				
FM17	The emergency exit route to be taken before flood waters rise is to exit the quarry onto Menangle Road and then north to Menangle Village.	When site evacuation declared.	Quarry Manager	-
FM18	During flooding the SES will advise through radio and the internet what roads are passable in the area. All site personnel will have secured and left the quarry by this time.	During flooding.	Quarry Manager	-
FM19	No attempt should be made to enter or cross any floodwater.	During flooding.	All personnel	-

Table 3-9 Summary of Flood Management Measures (Page 4 of 4) (Source: Table 5.1, Ref [5])

ID	Management measure/requirement	Implementation stage	Responsibility	Reference
Post flood event actions				
FM20	Ensure that damage is assessed and reported to Quarry Manager when all clear is given to return to the quarry.	Following flood event.	Quarry Manager	-
FM21	Rectify any flood-related damage, including areas undergoing rehabilitation.	Following flood event.	Quarry Manager	Consent Condition 32c(vii)
FM22	Debrief all key personnel and update/modify this FMP as necessary.	Following flood event.	Quarry Manager	-
FM23	If a flood event equivalent to 63 m AHD at Menangle weir does not occur between 17 June 2020 and 16 June 2021, then update the groundwater model following the first flood event equivalent to or greater than this level when it occurs[1].	Following flood event.	Quarry Manager	Consent Condition B36

1. A flood with a peak of approximately 10 m (approximately 71 m AHD) occurred between 21 and 25 March 2021.

Table 3-10 Flood Scour Risk and Remedial Response TARP (Page 1 of 9) (Source: Table 5.2, Ref [5])

Trigger	Action required	Timing	Follow up actions	Reporting*
Prior to extraction within substage				
Sand and soil extraction in the Stage 8 area.	Flood modelling to predict the peak flow velocities in potential extraction areas. Survey the extent of the exclusion zones – defined in the Consent as areas where predicted the peak flow velocity is >4 m/s during a 1% AEP flood.	Prior to extraction in each substage. Modelling for Substages 8A–8C has been completed. Exclusion zones associated with substages 8A–8C have been surveyed by a registered surveyor in accordance with Development Consent 85/2865 (the Consent) Condition A22.	Should scour occur that results in the loss of trees in the lower riverbank or Nepean River Buffer Zone: • review, and if required, update flood modelling; and • prepare Incident Report.	Incident Report: findings of flood/scour model review/update. Annual report: progress of actions arising from incident report.
Ongoing during extraction				
Sand and soil extraction within an area that may be inundated by flooding of the Nepean River with a predicted peak flow velocity of ≤4 m/s during a 1% AEP flood.	Quarry design to meet the requirements specified in: • the Consent (including Conditions A10, B32, B71 and B72); • the *Applicant's Description of Amended Project* (EMM 2019); and • the environmental management plans. Inspections to review compliance against the quarry design. The base of the active extraction area is to remain 1 m above the water table in accordance with Consent Condition B22.	Ongoing implementation of quarry design. Weekly inspections.	If the quarry does not meet the design requirements (eg batter angles are too steep), undertake earthmoving operations to ensure that quarry design conforms with the approved design. If any extraction is identified outside of the surveyed extraction area or within the exclusion zone: • cease work in this area immediately; • report as an incident/non-compliance as described in Section 8 of the *Menangle Sand and Soil Quarry Environmental*	Incident Report: providing details of non-compliance and corrective/remedial actions. Annual report: • progress of actions arising from incident report; and • summary of compliance with the Consent, design and environmental management plans relevant this TARP.

Table 3-10 Flood Scour Risk and Remedial Response TARP (Page 2 of 9) (Source: Table 5.2, Ref [5])

Trigger	Action required	Timing	Follow up actions	Reporting*
	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. The riverside batter will have a slope of no more than 1:5 in the final landform.		*Management Strategy* (EMS) and prepare Incident Report; and • rehabilitate the area in accordance with the *Menangle Sand and Soil Quarry Biodiversity and Rehabilitation Management Plan* (BRMP).	
	Commence rehabilitation of completed extraction area as soon as practicable, always ensuring that the active extraction area is no more than 0.33 ha, in accordance with Consent Condition B72.	Ongoing implementation of quarry design. Weekly inspections of active quarry area, including installation of pegs/flagging to mark the exclusion zone. Monthly review of active quarry area using most recent NearMap (or equivalent) images.	If any extraction is identified outside of the surveyed extraction area or within the exclusion zone: • cordon off part of the extraction area such that the active extraction area is ≤0.33 ha; • commence rehabilitation as described in the BRMP in the cordoned off area; and • report as an incident/non-compliance as described in Section 8 of the EMS and prepare Incident Report.	Incident Report: providing details of non-compliance and corrective/remedial actions. Annual Report: • progress of actions arising from incident report; and • summary of weekly inspections and monthly reviews.
	Install woody debris in rehabilitation area (as required by Consent Condition B78) and in restoration area as described in BRMP Section 7.5. Woody debris should be used to pin brush or mesh surface cover.	Ongoing.	Annual monitoring to confirm that woody debris meets the requirements of Consent Condition B78 (see BRMP Section 8.4).	Report woody debris installation over the last 12 months in the Rehabilitation and Restoration Site Annual Progress Report as described in BRMP Section 8.8.

Table 3-10 Flood Scour Risk and Remedial Response TARP (Page 3 of 9) (Source: Table 5.2, Ref [5])

Trigger	Action required	Timing	Follow up actions	Reporting*
Sand and soil extraction within an area that may be inundated by flooding of the Nepean River with a predicted peak flow velocity of >4 m/s during a 1% AEP flood.	Do not extract sand and soil within the exclusion zone, where predicted the peak flow velocity is >4 m/s during a 1% AEP flood as provided in Appendix 2 of the Consent. As described in Section 2.3.3 of the *Applicant's Description of Amended Project*, a qualified surveyor has undertaken the following: • 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; and • mark the boundaries of the adjacent restoration (no resource extraction) area. Sand and soil is not to be extracted from outside of the marked extraction area.	Each extraction area (8A–8C) is to be marked prior to extraction within the substage.	If any extraction is identified outside of the surveyed extraction area or within the exclusion zone: • cordon off part of the extraction area such that the active extraction area is ≤0.33 ha; • commence rehabilitation as described in the BRMP in the cordoned off area; and • report as an incident/non-compliance as described in Section 8 of the EMS and prepare Incident Report.	Incident Report: providing details of non-compliance and corrective/remedial actions. Annual report: • progress of actions arising from incident report; and • summary of compliance with quarry design.

Table 3-10 Flood Scour Risk and Remedial Response TARP (Page 4 of 9) (Source: Table 5.2, Ref [5])

Trigger	Action required	Timing	Follow up actions	Reporting*
Prior to flooding (Flood Management TARP actions relevant to substages 8A–8C)				
Stand-by: Bureau of Meteorology (BoM) issues 'flood watch' for Nepean River catchment. 'Flood watch' generally issued up to four days in advance of the expected onset of flooding but maybe as short as 12 hours.	Inform quarry personnel that flooding may impact the quarry in the coming days. Continue to monitor rainfall and flood watch advice.	Immediately following the 'flood watch' notification being received by the quarry.	Inform quarry personnel if BoM updates 'flood watch' so that flooding is no longer expected.	-
Risk level to be advised: BoM issues 'flood warning' for Nepean River catchment in vicinity of the quarry.	Inform quarry personnel that flooding within the Nepean River may inundate quarrying areas. Monitor rainfall and flood warning advice hourly.	Immediately following the 'flood warning' notification being received by the quarry	Continue to monitor BoM flood severity for updates. Proceed to next level of TARP if flood severity classed as 'minor'.	-
Minor: Nepean River flooding adjacent to the quarry is predicted to exceed 64 mAHD (ie a predicted Menangle Weir level of 63.5 mAHD).	Prepare the Stage 8 extraction area for potential flood inundation as described in the FMP, including: • Backfill the active Stage 8 extraction area to achieve a maximum batter slope of 1:5 adjacent to the riverside batter. • Flatten exposed batters and the base of the active extraction area to remove isolated highpoints that may be susceptible to scour. • Smooth all exposed sand and soil in the extraction area so that there are no rapid	Immediately (if safe to do so) following the prediction that flood levels will exceed 64 mAHD.	Continue to monitor BoM flood severity for updates. Proceed to next level of TARP if flood severity classed as 'moderate'. Proceed to 'event over' when flood warning removed.	-

Table 3-10 Flood Scour Risk and Remedial Response TARP (Page 5 of 9) (Source: Table 5.2, Ref [5])

Trigger	Action required	Timing	Follow up actions	Reporting*
	changes in slopes, particularly at the intersections of different batters. • Move all plant and infrastructure from the active extraction area to higher ground (above predicted maximum flood level). Sand face stabilisation and installation of pinning mesh or brush on potential erosion areas with particular focus in low areas where concentrated flood flows may enter or leave the extraction area.			
Moderate: Nepean River flooding adjacent to the quarry is predicted to exceed 66 mAHD – access road between site entry and operations area becomes inundated.	Move all plant to higher ground (above predicted maximum predicted flood level).	Immediately (if safe to do so) following the prediction that flood levels will exceed 66 mAHD.	Continue to monitor BoM flood severity for updates. Proceed to next level of TARP if flood severity classed as 'major'. Proceed to 'event over' when flood warning removed.	-
Major: Nepean River flooding adjacent to the quarry is predicted to exceed 74 mAHD – entire site inundated	Evacuate personnel from the site.	Immediately (if safe to do so) following the prediction that flood levels will exceed 74 m AHD.	Continue to monitor BoM flood severity for updates. Proceed to 'event over' when flood warning removed.	-
Event over: The SES issue safe to return or flood levels have receded below 64 m AHD.	Assess and report any damage to the active extraction area and operations area. Remediate areas of damage, including clearing of debris and areas undergoing rehabilitation at the time of the flood event. Recommence quarrying activities.	Within 5 days or as soon as practical following the 'event over' trigger is actioned.	Debrief all key personnel and update/modify the FMP as necessary.	-

Table 3-10 Flood Scour Risk and Remedial Response TARP (Page 6 of 9) (Source: Table 5.2, Ref [5])

Trigger	Action required	Timing	Follow up actions	Reporting*
Post-flood event				
Following a minor, moderate or major flood event.	Inspect the following areas that have been inundated: • lower riverbank and NRBZ adjacent to substages 8A–8C; • rehabilitation area; and • active extraction area.	Within 24 hours of floodwater receding.	Implement corrective actions for other triggers as required (see below).	Annual Report: summary of floods in preceding 12 months.
Any tree, major roots have been exposed, the roots have tilted or the tree appears to be unstable.	Inspect tree health and vulnerability.	Within 24 hours of floodwater receding.	If, for any tree, major roots have been exposed, the roots have tilted or the tree appears to be unstable: • the tree is to be inspected by an arborist and remedial actions implemented; and • report as an incident/non-compliance as described in Section 8 of the EMS and prepare Incident Report.	Incident Report: arborist findings and proposed remedial actions. Annual Report: progress of actions arising from incident report.
Rehabilitation areas have been scoured such that they are below the final landform level (approximately 64 m AHD).	Infill the scoured area with sand and soil to restore the final landform level.	Within 1 week of the flood event.	Monitor rehabilitation in accordance with the BRMP. Review revegetation performance and evaluate for flood hazard reduction and scour protection for the rehabilitated landform. Revegetate (see below).	Annual Report: • report any occurrences; • if scouring occurs, summarise revegetation performance for flood hazard reduction; and • present remedial actions.

Table 3-10 Flood Scour Risk and Remedial Response TARP (Page 7 of 9) (Source: Table 5.2, Ref [5])

Trigger	Action required	Timing	Follow up actions	Reporting*
Vegetation in post-extraction rehabilitation areas has been swept away.	Rehabilitate the area in accordance with the BRMP including: • addition of soil ameliorants if required; • placement of woody debris if density no longer meets the requirements of Consent Condition B78; and • infill seeding or planting.	Within 1 month of re-establishing the final landform.	Monitor rehabilitation in accordance with the BRMP.	Annual Report: report any occurrences and remedial actions.
Woody debris placed in post-extraction rehabilitation areas has been washed away.	Felled habitat trees and woody debris will be preserved for rehabilitation and restoration purposes. Woody debris will be placed over the ground in rehabilitation areas and pressed in or tracked-rolled to ensure intimate contact with soil to minimise the potential for erosion under the woody debris. Woody debris should be used to pin brush or mesh surface cover.	Within 1 week of the flood event.	Monitor woody debris placement in accordance with the BRMP Section 8.4.	Report woody debris installation over the last 12 months in the Rehabilitation and Restoration Site Annual Progress Report as described in BRMP Section 8.8.
Batters in extraction area have been scoured such that they are too steep and no longer meet the maximum batter angle requirements.	Infill scoured batters with sand and soil to ensure that they meet the maximum batter angle requirements.	Within 1 week of the flood event.	Review batter angles as part of weekly site inspections to ensure that quarry design conforms with the approved design. Undertake further rectification earthworks if required.	Annual Report: report any occurrences and remedial actions.

Table 3-10 Flood Scour Risk and Remedial Response TARP (Page 8 of 9) (Source: Table 5.2, Ref [5])

Trigger	Action required	Timing	Follow up actions	Reporting*
The base of the active extraction area has been scoured such that it is with 1 m of the normal water table.	Infill the base of the active extraction with sand and soil to ensure that it is not below the maximum depth (within 1 m of the normal water table). Reinstall bores in the base of the extraction area in accordance with the *Menangle Sand and Soil Quarry Soil and Water Management Plan* (SWMP).	Within 1 week of the flood event.	Measure the depth to groundwater using the bores in the active extraction area. Undertake further rectification earthworks if required.	Annual Report: report any occurrences and remedial actions.
Trees in the lower riverbank or NRBZ adjacent to the active extraction area or rehabilitation area have been uprooted. And/or Remnant native vegetation in floodplain strips immediately upstream or downstream of the active extraction area has been swept away.	If roots of the tree are no longer providing bank stability, install measures, eg coir matting, large rocks or rip rap, around the previous root area to prevent erosion. If part of the roots remain in the soil, leave in situ to allow the roots to continue to provide bank stability. Remove the upper part of the tree (chainsaw) to reduce the risk of the tree being washed away in subsequent flooding. If required, install measures to prevent erosion. Bank stabilisation and installation of pinning mesh or brush on potential erosion areas.	Within 2 weeks of the flood event.	Inspect area as part of the drainage, erosion and sediment control inspections (see SWMP Section 8): • weekly during normal operations; • daily during periods of rainfall; and • within 12 hours of the cessation of a rainfall event (greater than 10 mm) causing runoff to occur on, or from, the quarry. Undertake further stabilisation works if required. Should scour occur that results in the loss of trees: • review, and if required, update scour flood model; and • prepare Incident Report.	Incident Report: description of tree loss and proposed remedial actions. Annual Report: progress of actions arising from incident report.

Table 3-10 Flood Scour Risk and Remedial Response TARP (Page 9 of 9) (Source: Table 5.2, Ref [5])

Trigger	Action required	Timing	Follow up actions	Reporting*
The lower riverbank and NRBZ adjacent to the active extraction area or rehabilitation area is scoured such that the top of the lower riverbank is reduced to less than 64 mAHD or the bank becomes unstable.	Install measures, eg coir matting, large rocks or rip rap, in and around the scour area to prevent erosion. Rehabilitate and revegetate area.	Within 1 week of the flood event.	Inspect area as part of the drainage, erosion and sediment control inspections: • weekly during normal operations; • daily during periods of rainfall; and • within 12 hours of the cessation of a rainfall event (greater than 10 mm) causing runoff to occur on, or from, the quarry. Undertake further stabilisation works if required. Report as an incident/non-compliance as described in Section 8 of the EMS.	Incident Report: report on extent of bank loss and proposed remedial actions. Annual Report: progress of actions arising from incident report.
Sediment from the Stage 8 area deposits in the Nepean River such that river flow is impeded.	Inspection by an appropriately qualified geomorphologist to assess the potential impacts of the deposited sediment on river flow, bank stability and flooding and to determine the rate at which the deposited sediment is likely to be removed by river flow. Inspection by an appropriately qualified aquatic ecologist to determine if the changed flow conditions are likely to cause impacts to aquatic biodiversity. If significant impacts are predicted, prepare and implement a plan to remove the sediment. The sediment will be returned to the Stage 8 area.	Inspections within 1 month of the flood event. Plan preparation within 2 months of the inspection. Required works within 2 months of plan finalisation.	To be determined as part of the sediment removal plan. Report as an incident/non-compliance as described in Section 8 of the EMS.	Incident Report: • report on extent of incident; • geomorphologist report on impacts and proposed remedial actions; and • aquatic ecologist report on impacts and proposed remedial actions. Annual Report: progress of actions arising from incident report.

The FMP also included a TARP that must be followed when those trigger events occur covering:

- Prior to extraction within substage;
- Ongoing during extraction;
- Prior to flooding (substages 8A – 8C); and
- Post-flood event.

A copy of this plan is provided in **Table 3-10**, with a vegetation management and site stabilisation TARP provided in Appendix B of the FMP. The FMP[17] also advises that a log will be maintained to record substantiating activities associated with the quarrying process or relevant to the project consent conditions, including measures taken to implement the FMP.

3.4.7 Ephemeral Creek Management

The MOD 2 Consent required management of an ephemeral creek in accordance with the following conditions:

- An Ephemeral Creek Management Plan (**ECMP**) be prepared and approved by DPHI (Condition B40); and
- The management procedures specified in the approved ECMP needed to be implemented (Conditions B41 & 42).

An ECMP was prepared by Tooker & Associates dated 9 September 2024 and included in Appendix C of the SWMP (Ref [24]). Mitigation measures are:

- Detailed measures to manage and control soil erosion and bank stabilization and to limit the risk of impacts on downstream receiving environments are described in the approved SWMP. These measures will be implemented in the areas around the creek realignment;
- The realigned channel banks will be protected by a biodegradable mat until the riparian vegetation has established on the banks. Runoff from disturbed/unrehabilitated extraction area will be managed in a sediment pond and will not be allowed to discharge down the creek/riverbank. The realigned channel will be monitored after any significant rainfall event and any erosion will be repaired immediately;
- The creek realignment will be lined so will not introduce additional sediment into the Nepean River;
- The creek realignment and crossing will not significantly increase flood levels in the Nepean River upstream or downstream because there will be a significant increase of flood storage due to the quarry's sand/soil extraction work;
- Methods and timing of extraction are to demonstrate that the integrity of the ephemeral creek would be maintained for as long as practicable during operations. These works will be undertaken prior to sand extraction in Substages 8E, 8F and 8G and will be maintained for the duration of the Quarry's life. The realigned channel and creek crossing will be monitored on a weekly basis during operations to check for erosion, vegetation growth, removal of debris or need for any further control measures;

[17] Section 6.4, EMM (25 February 2022)

- Surface runoff from disturbed / unrehabilitated extraction area will be diverted to a sediment pond and be prevented from flowing into the realigned creek or Nepean River;
- The channel and crossing works have been designed to be safe, hydraulically, geotechnically and geomorphologically stable and non-polluting (surface runoff controlled). With rehabilitation of the surrounding extraction area, the realigned creek will integrate into the final landform. While the creek is normally dry, the bridge will negate the need to drive through the creek bed for access along the Nepean River. The realignment will not be visible from the Hume Highway;
- It is proposed to leave the creek realignment and bridge in place at the end of operations;
- The creek realignment and bridge will not affect works to establish River-Flat Forest EEC, to progressively landscape and revegetate the extraction area or to maintain the required batters;
- There will be no loss of flood storage compared with the pre development conditions (and in fact a significant net gain in flood storage), and rehabilitation works will incorporate geomorphological features such as mounds to let surface runoff infiltrate to creeks and river and this will minimise sediment laden runoff entering Nepean River;
- Surface runoff will be controlled to ensure that water entering the creek and river are suitable for the ecology and riparian vegetation;
- The works will ensure public safety (there is no public access) with incorporation of all site OH&S work measures; and
- Progressive rehabilitation of the area around the realigned creek (all extraction area) will commence as soon as extraction in the active extraction area is complete in accordance with the Biodiversity and Rehabilitation Management Plan.

3.4.8 Product Transport

Condition B52 of the MOD 2 Consent required accurate records to be kept of all truck movements to and from the site (including time of arrival and dispatch) and publish a summary of records on its website every 6 months.

Benedict advised that weighbridge data is collected for each truck movement. A summary of truck movements is published on the Benedict website, with a copy provided in **Figure 3-5**. The data shows that truck movements have been recorded between the period January 2021 to June 2024, with the quarterly truck movements less than the Consent limit. This data covers practically all the Audit Period (9 August 2023 to 8 August 2024).

Figure 3-5 Menangle Truck Movement Summary (Source: Benedict website)

	Actual	Consent
Jan 21 - Jun 21	15122	21172
Jul 21 - Dec 21	20122	21616
Jan 22 - Jun 22	9059	21172
Jul 22 - Dec 22	16000	21551
Jan 23 - Jun 23	15818	21551
July 23 - Dec 23	16482	21400
Jan 24 - Jun 24	13227	21320

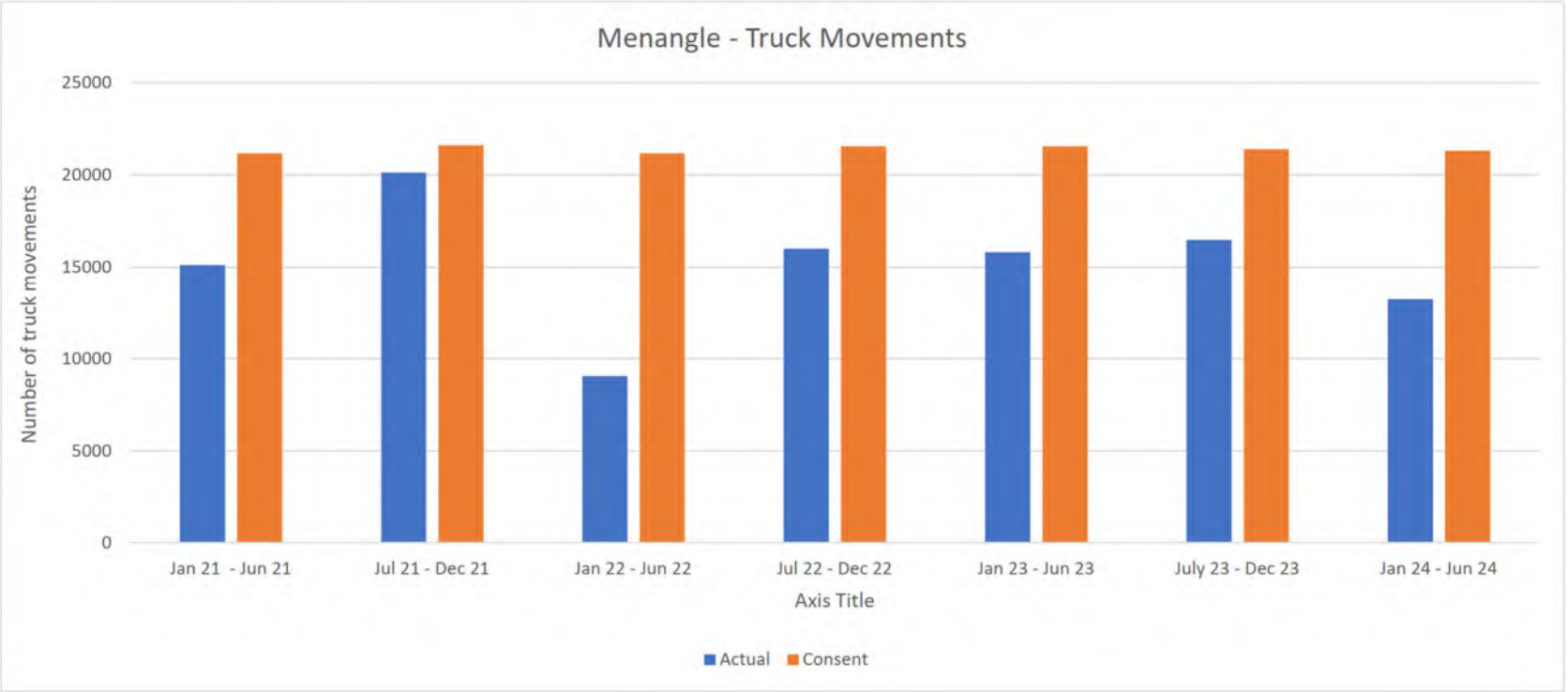


Table 3-11 Annual Rehabilitation and Restoration Monitoring Summary and Schedule (Page 1 of 2) (Source: Table 8.5, EMM, 11/09/24)

Stage	Area (ha)	Number of plots											
		Year											
		1	2	3	4	5	6	7	8	9	10	11	12+
Floristic monitoring													
6	2.13	Rehabilitation	2	2	-	2	Continue monitoring until completion criteria are met						
7	4.95	Rehabilitation following quarry closure											
8A	0.79	Extraction/ rehabilitation	1	1	1	1	1	Continue monitoring until completion criteria are met					
8B	0.64	-	Extraction/ rehabilitation	1	1	1	1	1	Continue monitoring until completion criteria are met				
8C	0.48	-	-	Extraction/ rehabilitation	1	1	1	1	1	Continue monitoring until completion criteria are met			
8D	0.81				Extraction/ rehabilitation	1	1	1	1	1	Continue monitoring until completion criteria are met		
8E	0.87					Extraction/ rehabilitation	1	1	1	1	1	Continue monitoring until completion criteria are met	
8F	0.83						Extraction/ rehabilitation	1	1	1	1	1	Continue monitoring until completion criteria are met
8G–8M	Various	Start monitoring in each substage (1 plot per substage) after it has been extracted.											
Restoration area 1[1]	2.73	Restoration works	3	3	3	3	3	Continue monitoring until completion criteria are met					
Restoration area 2[1]	3.61	-	-	Restoration works	4	4	4	4	4	Continue monitoring until completion criteria are met			

Table 3-11 Annual Rehabilitation and Restoration Monitoring Summary and Schedule (Page 2 of 2) (Source: Table 8.5, Ref [25])

Stage	Area (ha)	Number of plots											
		Year											
		1	2	3	4	5	6	7	8	9	10	11	12+
Restoration area 3[1]	3.07	-	-	-	-	-	Restoration works	3	3	3	3	3	Continue monitoring until completion criteria are met
Restoration area 4–7[1]	5.64	-	-	-	-	-	-	-	Restoration works	Schedule to be based on rate of extraction Restoration Area 4: 1 plot Restoration Area 5: 1 plot Restoration Area 6: 1 plot Restoration Area 7: 2 plots			
Landform establishment, stability and growth medium development	-	✓	✓	✓	✓	✓	✓	Continue monitoring until growth medium development and stability criteria have been met.					
Weeds	Varying	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Nest box/woody debris	15.61[2]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Total	-	**0**	**6**	**7**	**6**	**8**		**To be determined based on progressive extraction and rehabiliation rates**					

1. See Table C.2 and Figure C.1 in the *Biodiversity Offset Strategy* (Appendix C).
2. And any nest-boxes placed in the NRBZ.

3.4.9 Biodiversity and Rehabilitation

In terms of biodiversity and rehabilitation, the MOD 2 Consent required:

- The construction of linear infrastructure to meet certain requirements (Conditions B65 & B66);
- A biodiversity offset strategy (Conditions B67 – B69);
- Specified rehabilitation objectives (Condition B70);
- Specified requirements for progressive rehabilitation (Conditions B71 & B72);
- Specified requirements for a BRMP (Condition B73); and
- The management procedures specified in the approved BRMP needed to be implemented (Conditions B74 – B78).

Monitoring

The BRMP[18] advised that the progressive rehabilitation and restoration works at Menangle Quarry will require annual monitoring during operations until completion criteria have been met. The monitoring will consist of:

- Landform establishment and stability assessment (see Table 8.1, BRMP);
- Growth medium development assessment (see Table 8.1, BRMP);
- Floristic monitoring (see Section 8.4.1, BRMP);
- Weed monitoring (see Section 8.4.2, BRMP); and
- Nest-box and woody debris (see Sections 8.4.3 and 8.4.4, BRMP).

The rehabilitation and restoration monitoring schedule is provided in **Table 3-11**. The monitoring program schedule may be updated based on the rate of progression of the quarry from one substage to the next. For example, monitoring of rehabilitation in Stage 8C will not be started in Year 4 if excavation (and hence vegetation clearing) is in Stage 8C delayed and does not occur in Year 3.

In addition to the formal rehabilitation monitoring program, the quarry's Rehabilitation Officer is required to frequently inspect all of the areas addressed by the BRMP. The Rehabilitation Officer is to undertake weekly inspections including:

- Evidence that extraction has occurred outside of the pegged and flagged extraction area;
- Evidence of unauthorised access to property (e.g. damaged fencing, litter, vandalism);
- Evidence of pests;
- Any new/unrecorded erosion or sedimentation;
- Weed regeneration/re-introduction to areas where weed control has been applied;
- Rehabilitation trials progress; and
- Germination, health and vigour of vegetation under management.

Quarry workers are also required to report incidental observations relevant to the successful implementation of the BRMP in the Environmental Incident and Action Register.

[18] Sections 8.4 - 8.6, EMM (11 September 2024)

Mitigation Measures

The mitigation measures included in the BRMP[19] included:

- Environmental roles and responsibilities for quarry manager, the rehabilitation officer and the consultant ecologist;
- Vegetation management;
- Seed collection and propagation;
- Water and sediment management;
- Weed control; and
- Pest management.

3.5 Reviews and Approvals from NSW Government Agencies

3.5.1 DPHI

Documentation provided on the Benedict website indicates that the DPHI has received, reviewed and approved plans prepared by environmental consultants engaged by Benedict, which have been updated on a regular basis. A summary of these plans and DPHI reviews / approvals is provided in **Table 3-12**.

In their letters, the DPHI advises that the plans have addressed matters previously raised by the DPHI and have been prepared by suitably qualified persons.

Two sets of specific feedback have been provided by DPHI on environmental plans submitted by Benedict over the past two years. This feedback concerns:

- The aboriginal cultural heritage management plan (version 5); and
- The Menangle Quarry – 2023 Annual Review prepared by Benedict (22 April 2024).

Feedback on the aboriginal cultural heritage management plan was:

> '*I note the scar tree survey identifies a tree (TN1) as having a wound determined to have been highly likely to be the result of Aboriginal cultural origin. I also note this tree is outside the excavation area and will not be disturbed by the project. However, you must ensure the tree is managed in consultation with relevant Aboriginal stakeholders.'*

[19] Section 5, EMM BRMP

Table 3-12 Summary of DPHI Review / Approvals of Menangle Quarry Environment Plans

Title	Version	Plan Date	Date of DPHI Review / Approval Letter
Environmental Management Strategy	2	17/06/2021	21/06/2021
	5	28/08/2024	13/09/2024
Biodiversity and Rehabilitation Management Plan	3.1	23/02/2022	3/03/2022
	5	11/09/2024	20/09/2024
Soil and Water Management Plan	3.1	25/02/2022	25/03/2022
	5	9/09/2024	20/09/2024
Noise management plan	6	4/03/2021	21/06/2021
	8	28/06/2024	13/09/2024
Air quality management plan	6	12/04/2021	14/04/2021
	11	28/06/2024	13/09/2024
Flood management plan	2	1/04/2021	21/06/2021
	3	25/02/2022	25/10/2022
Traffic management plan	7	25/02/2022	23/03/2022
	8	30/11/2023	13/09/2024
Aboriginal cultural heritage management plan	3	28/02/2022	25/03/2022
	5	28/08/2024	23/09/2024
Menangle Quarry - 2023 Annual Review	1	22/04/2024	2/08/2024

Feedback on the Menangle Quarry – 2023 Annual Review was:

1. '*NSW Planning has reviewed the Annual Review and considers it to generally satisfy the reporting requirements of the consent and the NSW Planning Annual Review Guideline (October 2015). Please make publicly available a copy of the 2023 Annual Review on the company's website within 30 days*.'
2. '*Please also upload to the website the monitoring associated with all management plans (that is, a comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs) in accordance with Condition D15(iv), Rehabilitation monitoring and a complaints number in accordance with D15(vii) (contact details to enquire about the development or to make a complaint) within 30 days from the date of this letter.'*
3. *'Please ensure that the website is kept up-to-date with all required information and documents.'*
4. *'For future Annual Reviews please include the following information:*
    - *maps of the operation showing the regional context (aspects relevant to the community such as residential areas or other key relevant land uses), development consent*

boundary, current operational disturbance footprint, and any offset areas and approved limits of extraction; and

- *a summary of criteria, performance, trends/ key management implications and proposed management actions (similar to Table 6 in the mining Annual Review Guidelines).'*

5. *'Please note that the NSW Planning's acceptance of this Annual Review is not an endorsement of the compliance status of the project.'*

3.5.2 NSW EPA

Data provided by the NSW EPA website indicates that annual returns for EPL 3991 have been made by MSS since 2000. No non-compliances are recorded for the past four annual returns.

Variations to the EPL have been regularly made in most years at the time of renewal. The last variation was issued on 1 July 2024.

The NSW EPA website does not record any enforceable undertakings, prosecutions or civil proceedings for the Site. The Site is not recorded as having a contaminated land record or listed as a notified contaminated site.

3.5.3 Campbelltown and Wollondilly Councils

Documentation provided on the Benedict website indicates that Campbelltown and Wollondilly Councils have been consulted with regards to the preparation of environmental plans for the Site. The development approval issued for sand and soil extraction from the Stage 8 area indicates that environmental issues raised by the local Councils have been addressed to the satisfaction of the LEC, DPHI and NSW EPA.

3.5.4 Fire and Rescue NSW

Documentation provided on the Benedict website indicates that FRNSW has not raised any past issues outside those addressed by the development approval issued for the Stage 8 operation.

3.6 Stakeholder Consultation

Consultation undertaken by the Auditor for this IEA involved a request for inputs from NSW Government agencies that are stakeholders in the approved development. These agencies comprised the DPHI, NSW EPA, Campbelltown / Wollondilly Councils, TfNSW and FRNSW. Emails were initially sent to each of the above agencies on 4 October 2024 advising them of the audit and the scope of the audit and inviting them to provide comments/requirements or specific environmental issues they required the audit to target. A follow up email was then sent on 15 October 2024.

In addition to the above agencies, the DPHI[20] requested that the Auditor also contact the following organisations:

- Biodiversity, Conservation and Science Group (**BCSG**) within the Department of Climate Change, Energy, the Environment and Water;
- Tharawal Local Aboriginal Land Council;

[20] DPHI 23/10/24 email

- The Water Group within the DPHI;
- Heritage Council of NSW; and
- NSW Resources.

Emails were sent to each of the additional organisations on 20 February 2025 advising them of the audit and the scope of the audit and inviting them to provide comments/requirements or specific environmental issues they required the audit to target.

Copies of inputs from stakeholders is provided in **Appendix C** with a summary of stakeholder inputs provided in **Table 3-13**.

3.7 Site Inspection

The site inspection was conducted by the Auditor on 24 October 2024. All areas of the site were inspected by the Auditor and the Auditor was not refused entry to any part of the Facility. The site inspection involved a walkover with Benedict site personnel, which included the observation of:

- Site access and security;
- Weighbridge, wheel wash, weather station and admin area;
- Workshop, fuel storage and laydown area;
- Dust suppression equipment and operation;
- Groundwater monitoring wells and dust deposit gauge stations;
- Northern sand and soil processing and stockpile area;
- Unmined southern Stage 8 area;
- Northern plateau;
- Rehabilitated and final landform areas in Stages 8A – 8C;
- Bird boxes established in native trees;
- Rip rap protected surface water drains; and
- Scar trees.

Copies of photos taken by the Auditor during the site inspection showing current site conditions are provided in **Appendix F**.

Table 3-13 Summary of Stakeholder Inputs

Stakeholder	Contact	Date of Input	Stakeholder Input	Auditor Response
BCSG	The appropriate officer at info@environment.nsw.gov.au	21/02/25	No issues raised	None required
Campbelltown City Council	Greg Woods – Acting Coordinator City Standards & Health	9/10/24 & 22/10/24	The facility is not in Council's LGA but both the facility and the LGA share access with the Nepean River. Surface water quality in Nepean River downstream of Site is a concern to Council.	Refer Section 4.7.1
DPHI	Katrina O'Reilly – Team Leader - Compliance	23/10/24	Auditor to contact additional organisation comprising BCSG, the local aboriginal land council, the DPHI Water Group, the Heritage Council of NSW and NSW Resources. Areas to be focused on to include: • Compliance with approved extraction boundaries, stages, areas, depths & limits; • Compliance with all commitments, reporting and monitoring requirements within management plans; • Management, monitoring and responses of complaints register; and • Compliance with conditions relating to rehabilitation and riparian management.	Refer Section 4.7.2
NSW EPA	Matthew Davidson – Operations	21/10/24	The NSW EPA advised that the EPL was varied on 1/07/24 to include additional noise monitoring requirements relating to Stage 8 in line with the Consent. The NSW EPA also advised that they did not have any major concern with operations at the Facility, however, the following matters needed to be reviewed by the audit: • Receipt and processing/use of waste streams; • Air quality impacts, particularly management and monitoring of dust generation; and • Compliance with noise limits and monitoring requirements	Refer Section 4.7.3

Stakeholder	Contact	Date of Input	Stakeholder Input	Auditor Response
Fire and Rescue NSW	The appropriate officer at info@fire.nsw.gov.au	4/10/24	No issues raised	None required
Heritage Council of NSW	Tanya Pelz, Heritage NSW	20/02/25	No issues raised	None required
NSW Resources	The appropriate officer at industry.engagement@regional.nsw.gov.au	21/02/25	No issues raised	None required
Tharawal Local Aboriginal Land Council	The appropriate officer at reception@tharawal.com.au	20/02/25	No issues raised	None required
Transport for NSW	Muriel Maher – Senior Coordinator Land Use, West & Central Transport Planning	15/10/24	No issues raised	None required
Water Group, DPHI	The appropriate officer at water.enquiries@dpie.nsw.gov.au	20/02/25	No issues raised	None required
Wollondilly Shire Council	Corrie Swanepoel – Manager Development Services	23/10/24	Matters needing to be considered are: • Confirm/review any riparian restoration requirements under the conditions of consent • Confirm if a Controlled Activity Approval (CAA) under the Water Management Act has been issued; • Consider requirements of Vegetation Management Plans; • Include a review of impacts caused by flooding on site operation; • During the reporting period Council received a customer request/enquiry regarding noise from fireworks during an event at the site. Whilst this does not fall within the parameters of the EPL it may be worth noting.	Refer Section 4.7.4

3.8 Interviews with Benedict Personnel

Site personnel were interviewed during the Facility inspection. The site personnel interviewed were:

- The Benedict Environmental Compliance Manager: Alycia O'Brien; and
- The Benedict Quarry Manager: Michael Holz.

The interviews involved:

- Obtaining feedback and information from the Benedict personnel addressing issues raised by the checklists. Most of this information consisted of documentation that was provided to the Auditor prior to the site inspection;
- Discussion of site conditions as observed during the site inspection;
- Review of the checklists on-site and obtaining additional verbal information following the site inspection; and
- The Auditor obtaining feedback from Benedict personnel in response to the release of a draft version of the audit report.

3.9 Findings Made by Audit Team Experts

The Auditor collected and assessed the data obtained from the documentation review work, site inspection, on-site meeting with Benedict, and stakeholder consultation. A draft audit report was then prepared and distributed to the audit team specialists in ecology, surface water and groundwater, as required by the DPHI.

The audit team specialists then reviewed the data and provided feedback to the Auditor, with a copy of their report provided in **Appendix D**.

The Auditor then combined the findings and recommendations made by the Audit Team Specialists in the Audit report.

4. Audit Findings

4.1 Approvals / Consents / Licences and Document List

The approvals / consents / licenses that control operations at Menangle Quarry are:

- Modification 2 to development consent 85/2865 (the 'Mod 2 Consent') issued in November 2021 for the extraction of sand and soil from the Stage 8 area (Ref [4]);
- The NSW EPA issued EPL 3991 for Menangle Quarry (Ref 26]); and
- The NRAR issued Water Licence CAA-2021-11223 for Stage 8 sand extraction on 14 February 2022 (Ref [27]).

Menangle Quarry does not require or have a mining licence.

A list of DPHI reviews / approvals for Menangle Quarry Environment Plans is provided in **Section 3.5.1**. A list of the documents reviewed for the audit is provided in **Section 2.6**

4.2 Compliance Status Descriptors

The meaning of compliance status descriptors used by the Independent Audit tables in **Appendix E** is summarised in **Table 4-1**. Risk levels for each non-compliance identified have been assessed in accordance with **Table 4-2**.

Table 4-1 Compliance Assessment Matrix

Assessment	Criteria
Compliance	Compliance: • The Facility complies with the requirements of applicable pre-operational Consent conditions • A judgement made by the Auditor that the activities undertaken and the results achieved fulfil the specified requirements of the audit criteria. While further improvements may still be possible, the minimum requirements are being met.
Non-compliance	Non-compliance: • Clear evidence has been collected to demonstrate the requirement has not been complied with and is within the scope of the audit • Site displays little or no evidence of compliance with the requirements of the regulatory documentation. Note: Where the Auditor has not been able to collect enough verifiable evidence to demonstrate that the intent and all elements of the requirement of the regulatory approval have been complied with within the scope of the audit. In the absence of enough verification, the auditor may in some instances be able to verify by other means (visual inspection, personal communication, etc.) that a requirement has been met. In such a situation, the requirement should still be assessed as not verified. As the condition cannot be verified it is treated as a non-compliance.
Not triggered	Not applicable / not triggered • The respective condition / requirement was not activated within the scope of the audit.
Noted	A statement or fact where no assessment of compliance is required.

Table 4-2 Risk Assessment Matrix

Risk Level	Description
High	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-compliance with: • potential for serious environmental consequences, but is unlikely to occur; or • potential for moderate environmental consequences but is likely to occur.
Low	Non-compliance with: • potential for moderate environmental consequences, but is unlikely to occur; or • potential for low environmental consequences but is likely to occur
Negligible	General compliance
Administrative non-compliance	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

4.3 Previous Audit Recommendations

This is the first environmental audit for the Stage 8 sand and soil extraction operation. Consequently, there are no previous audit recommendations.

4.4 Summary of Agency Notices, Orders, Penalty Notices or Prosecutions

The Auditor is not aware of any agency notices, order, penalty notices or prosecutions against the Facility during the Audit Period (9 August 2023 to 8 August 2024).

4.4.1 DPHI Review of Benedict 2023 Annual Review Report

Review comments on the Benedict 2023 Annual Review report were provided by the DPHI in a letter dated 2 August 2024. These were:

- DPHI considers the report generally satisfied the reporting requirements of the consent and the NSW Planning Annual Review Guideline (October 2015).
- Upload a copy of the report to the Benedict website together with copies of monitoring reports. Keep the website up-to-date.
- Future Annual Reviews need to include the following information:
  - Maps of the operation showing the regional context (aspects relevant to the community such as residential areas or other key relevant land uses), development consent boundary, current operational disturbance footprint, and any offset areas and approved limits of extraction; and
  - A summary of criteria, performance, trends/ key management implications and proposed management actions (similar to Table 6 in the mining Annual Review Guidelines).

4.4.2 Compliance with NSW EPA EPL 3991

The Auditor checked the NSW EPA POEO register[21] on 21 February 2025 and found no penalty notice, enforceable undertaking, or prosecution had been issued for Menangle Quarry over the Audit Period (9 August 2023 to 8 August 2024).

4.4.3 Compliance with Water Licence CAA-2021-11233

The Auditor reviewed compliance with Water Licence CAA-2021-11233 by obtaining documentation from Benedict, checking the NSW EPA website for compliance with the EPL, and observing site conditions during an inspection conducted on 24 October 2024. A summary of the licence conditions and the compliance check made by the Auditor is provided in **Table 4-3**.

Table 4-3 Compliance Assessment for Water Licence Conditions

No.	Condition	Observation
TC-C002	Copy of licence must be kept at site and provided to relevant personnel	Copy of licence provided by Benedict
TC-C003 (A)	Before commencing work, erosion and sediment control measures must be established and implemented in accordance with requirements in Managing Urban Stormwater Manual, Volume 1, Soils and Construction	No actions by regulatory authorities; and Auditor observations during 24/10/24 inspection
TC-C003(B)	Control measures maintained until work completed	
TC-C004 (A)	All materials must be stored away from the water source so that materials do not: obstruct water flow, or wash into the water source, or cause damage to river banks. When the controlled activity authorised by licence has been completed, surplus materials must be removed from waterfront land	No actions by regulatory authorities; and Auditor observations during 24/10/24 inspection
TC-C007	The controlled activity authorised by the licence must be carried out in accordance with plans/documents held by NRAR	These documents covered by those approved by DPHI & listed in Section 2.6
TC-C013	At completion of the maintenance period for the controlled activity authorised by this approval, the approval holder must report in writing to NRAR that the controlled activity has been completed, and the water source and waterfront land have been restored and rehabilitated in accordance with plans held by NRAR	This work not commenced during Audit Period
TC-C005	The approval holder must notify NRAR by lodgement of a Controlled Activity Approval – Surrender application within 30 days of the controlled activity being completed.	This work not commenced during Audit Period

[21] https://www.epa.nsw.gov.au/licensing-and-regulation/public-registers

The Auditor concluded that the weight of evidence supported the conclusion that Menangle Quarry complied with the conditions of the Water Licence.

4.5 Survey Data Provided by Benedict

Condition A22 of the Mod 2 Consent required that prior to the commencement of Quarrying Operations in each of Phases 1 to 7, the Applicant must:

a) Engage a registered surveyor to mark out the boundaries of the approved limits of extraction for the relevant Substages in each phase (as set out conceptually in the Appendix 1 and as amended by the conditions of this consent)[22]; and

b) Submit a survey plan of these boundaries and their GPS coordinates to the Planning Secretary; and

c) Ensure that these boundaries are clearly marked at all times during the life of the development in a manner that allows operating staff and inspecting officers to clearly identify those limits.

During the audit, Benedict provided the Auditor with three spreadsheets that provided survey plans and GPS coordinates for:

- Stage 8(a) dated 23/08/23;
- Stage 8(b) dated 20/11/23; and
- Stage 8(c.) dated 1/05/24.

The data provided by each surveyed area consisted of the survey date, the Garmin Waypoint reference number, the star picket ID number, the south and east coordinates. Copies of the survey drawings provided in the Benedict spreadsheets are provided in **Figures 4-1** to **4-7**.

During the site inspection conducted on 24 October 2024, the Auditor observed that the survey boundaries were clearly marked by star pickets and flagging tape.

[22] Note: Phases 1-7 are parts of the Stage 8 area defined in the consent definitions. Phase 1 = Substages 8A-8B, Phase 2 = Substage 8C, Phase 3 = Substages 8D-8E, Phase 4 = Substages 8F-8G, Phase 5 = Substages 8H-8I, Phase 6 = Substages 8J-8K, Phase 7 = Substages 8L-8M

Figure 4-1 Benedict Survey Drawing for Stage 8A Extraction Boundary Survey Peg Locations (23 August 2023)

Figure 4-2 Benedict Survey Drawing for Stage 8A 10m River Offset Boundary Survey Peg Locations (23 August 2023)

Figure 4-3 Benedict Survey Drawing for Stage 8A Rebab Boundary Survey Peg Locations (23 August 2023)

Figure 4-4 Benedict Survey Drawing for Stage 8B Extraction Boundary Survey Peg Locations (20 November 2023)

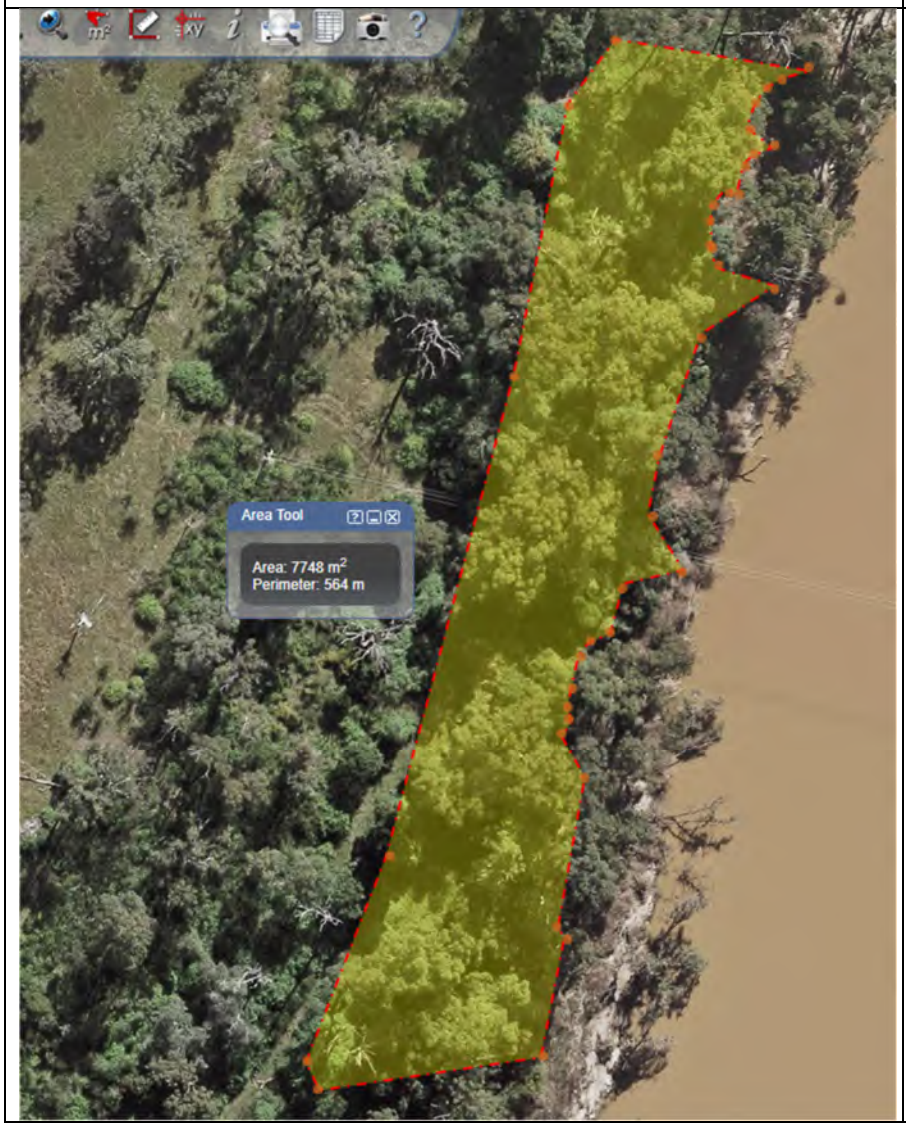


Figure 4-5 Benedict Survey Drawing Stage 8B 10m River Offset Boundary Survey Peg Locations (20 November 2023)

Figure 4-6 Benedict Survey Drawing for Stage 8C Extraction Boundary Survey Peg Locations (1 May 2024)

Figure 4-7 Benedict Survey Drawing for Stage 8C 10m River Offset Boundary Survey Peg Locations (1 May 2024)

4.6 Rehabilitation Data

4.6.1 Overview

During the site inspection, Benedict advised the Auditor that the rehabilitation work was a work in progress and had not yet been completed in any part of Stage 8. The work broadly involves planting, seeding, hydromulching, creating landforms & weed control. Auditor observed this work was occurring.

Further details were:

- The rehabilitation work is managed by the Benedict Rehabilitation Manager Matthew Bassett;
- Only on-site material is used to backfill the quarried void. This includes stripped soil with weeds, screened material, then a 200- 250mm thick topsoil layer;
- Trees are grown from seedlings with only native trees being planted. The seedlings were being purchased from Council's Picton Depot;
- The quarrying and rehabilitation work was undertaken in 30m wide increments;
- An annual tree count is undertaken by Benedict's environmental consultant to provide feedback to Benedict on progress; and
- Once an area has been rehabilitate, it is then maintained.

The results of annual rehabilitation monitoring for the Stage 8 area are documented in a Site Rehabilitation and Restoration Annual Progress Report (**SRRAPR**). The first SRRAPR was prepared by Benedict dated 28 March 2024 for the 2023 calendar year period (Ref [12]) and included in the Benedict 2023 Annual Review (Ref [15]). The SRRAPR provided monitoring results for:

- Landform establishment, stability and growth medium;
- Biodiversity management measures;
- Weed monitoring;
- Floristic monitoring; and
- Nest box and woody debris program.

4.6.2 Landform Establishment, Stability and Growth Medium

The landform establishment, stability and growth medium report (Section 2, SRRAPR) provided results on the effectiveness of management actions, progressive improvements, and other comments (including reasons for non-completion) for stages 6, 7, 8A - 8C and restoration area 1. A copy of the landform establishment, stability and growth medium summary provided by the 2023 SRRAPR is presented in **Table 4-4**.

Table 4-4 2023 Landform Establishment, Stability and Growth Medium Rehabilitation Summary (page 1 of 10) (Source: 2023 SRRAPR, Ref [12])

Landform establishment, stability and growth medium summary							
Management actions	**Performance/completion criteria**	**Progress against performance/completion criteria**			**Description of management actions/monitoring in the reporting period (including where undertaken, any variations and the reasons for variation)**	**Visual observations, monitoring results and trends**	**Effectiveness of management actions, progressive improvements, and other comments (including reasons for non-completion)**
		Required completion year	**Anticipated/ actual completion year**	**Action completed?** (Yes/No)			
STAGE 6 & 7 - Establish stable final landform areas							
STAGE 6 Establish stable final landform area		Completed	Completed	See below	-	The area is formed, stable, and revegetated	completed
	The final landform is suitable for the final land uses and generally compatible with surrounding topography.	-	-	Yes	None	As above	completed
	No reduction in flood storage capacity, compared with pre-development conditions.	-	-	Yes	None	The final landform is lower than the former landform, so we created flood storage volume	completed
	Final landform incorporates geomorphological features to allow for the free draining discharge of clean water.	-	-	Yes	None	It is suitably formed	completed

Table 4-4 2023 Landform Establishment, Stability and Growth Medium Rehabilitation Summary (page 2 of 10) (Source: 2023 SRRAPR, Ref [12])

Landform establishment, stability and growth medium summary							
Management actions	**Performance/completion criteria**	**Progress against performance/completion criteria**			**Description of management actions/monitoring in the reporting period (including where undertaken, any variations and the reasons for variation)**	**Visual observations, monitoring results and trends**	**Effectiveness of management actions, progressive improvements, and other comments (including reasons for non-completion)**
		Required completion year	**Anticipated/ actual completion year**	**Action completed?** (Yes/No)			
	Minimal sediment-laden run-off into the Nepean River.	-	-	Yes	None	There is no sediment laden water being produced	
STAGE 7 Establish stable final landform in **non-operational** area		2022	2022	See below	-	The landform is stable but being reshaped to forma more useful final landform	
	The final landform is suitable for the final land uses and generally compatible with surrounding topography.			No	It is being modified/reshaped	As above	It will be reshaped by mid-2024
	No reduction in flood storage capacity, compared with pre-development conditions.			No	As above	As above	The landform provides more flood storage than the pre-extraction landform
	Final landform incorporates geomorphological features to allow for the free draining discharge of clean water.			Yes	As above	As above	
	Minimal sediment-laden run-off into the Nepean River.			Yes	As above	The banks are grassed with Kikuyu and are stable	It will be supplemented with plantings of some riverine tree species
STAGE 7 Establish stable final landform in the **operational** area (post-closure)		2036	2036	No	-	The Processing Area continues to be used. Final landform will be established following the completion of quarry operations.	-

Table 4-4 2023 Landform Establishment, Stability and Growth Medium Rehabilitation Summary (page 3 of 10) (Source: 2023 SRRAPR, Ref [12])

Landform establishment, stability and growth medium summary							
Management actions	**Performance/completion criteria**	**Progress against performance/completion criteria**			**Description of management actions/monitoring in the reporting period (including where undertaken, any variations and the reasons for variation)**	**Visual observations, monitoring results and trends**	**Effectiveness of management actions, progressive improvements, and other comments (including reasons for non-completion)**
		Required completion year	**Anticipated/ actual completion year**	**Action completed?** (Yes/No)			
	The final landform is suitable for the final land uses and generally compatible with surrounding topography.			No	None	-	-
	No reduction in flood storage capacity, compared with pre-development conditions.			No	None	-	-
	Final landform incorporates geomorphological features to allow for the free draining discharge of clean water.			No	None	-	-
	Minimal sediment-laden run-off into the Nepean River.			Yes	None	-	-

Table 4-4 2023 Landform Establishment, Stability and Growth Medium Rehabilitation Summary (page 4 of 10) (Source: 2023 SRRAPR, Ref [12])

Landform establishment, stability and growth medium summary							
Management actions	**Performance/completion criteria**	**Progress against performance/completion criteria**			**Description of management actions/monitoring in the reporting period (including where undertaken, any variations and the reasons for variation)**	**Visual observations, monitoring results and trends**	**Effectiveness of management actions, progressive improvements, and other comments (including reasons for non-completion)**
		Required completion year	**Anticipated/ actual completion year**	**Action completed?** (Yes/No)			
SUBSTAGE 8A - Establish stable final landform areas							
SUBSTAGE 8A The final landform is consistent with the Consent		2024	2023	Yes	The extraction of Substage 8A is completed and the final landform has been created. Weedy topsoil and weedy vegetated materials from the advancing quarry were placed in the floor of the completed extraction area to build up the final landform. The completed extraction area has been backfilled to approximately 64 m AHD with scalps, coarse rejects and soil.	Slope angles are consistent with the Consent and the SWMP: • riverside batter: 1:5; • extraction area: minimum 1:50 slope towards swale at base of riverside batter; and • landward batter: maximum of 1:1, except where the batter is formed by the natural sandstone rock escarpment, which may be steep/vertical in places.	
	The final landform is suitable for the final land uses and generally compatible with surrounding topography.			Yes	As above.	As above.	The timber and brush stations have been placed and the area has been Hydroseeded with the recommended species mix.
	No reduction in flood storage capacity, compared with pre-development conditions.			No	As above.	As above.	The extraction has resulted in a net loss of materials in this area
	Final landform incorporates geomorphological features to			Yes	As above.	As above.	Most water percolates down through the backfilled material down to the water

Table 4-4 2023 Landform Establishment, Stability and Growth Medium Rehabilitation Summary (page 5 of 10) (Source: 2023 SRRAPR, Ref [12])

Landform establishment, stability and growth medium summary							
Management actions	**Performance/completion criteria**	**Progress against performance/completion criteria**			**Description of management actions/monitoring in the reporting period (including where undertaken, any variations and the reasons for variation)**	**Visual observations, monitoring results and trends**	**Effectiveness of management actions, progressive improvements, and other comments (including reasons for non-completion)**
		Required completion year	**Anticipated/ actual completion year**	**Action completed?** (Yes/No)			
	allow for the free draining discharge of clean water.						table which is only a few metres below
	Minimal sediment-laden run-off into the Nepean River.			Yes	The area has been hydroseeded and has a cover crop	The final landform profile prevents runoff from the extraction area as its lower than the 10m buffer	Effective
SUBSTAGE 8A The landform area is stable	Areas of active erosion are minimised.	2024	2023	Yes	The area was rehabilitated as intended as well as two large adjoining Additional Restoration Areas (outside of the Extraction Area and the Restoration Area 1) was weeded and mulched (and selected eucalypts were planted) to reduce the migration of weeds into the rehabilitated areas.	Spot spraying of weeds has been required in the Additional Restoration Areas as well as in the Restoration Area 1 and Substage 8A Extraction areas. This has not affected land stability but is monitored as the ground is exposed after weed removal	The Additional Restoration Areas (see Figure 11) allows a bigger buffer between other areas and
	No areas of active erosion as determined by: • no drills/gullies • no sheet erosion present • no tunnel erosion present.			No	See Attachment A: Drainage, erosion and sediment control inspections record.	See Attachment A: Drainage, erosion and sediment control inspections record.	There are no areas of active erosion.

Table 4-4 2023 Landform Establishment, Stability and Growth Medium Rehabilitation Summary (page 6 of 10) (Source: 2023 SRRAPR, Ref [12])

Landform establishment, stability and growth medium summary							
Management actions	**Performance/completion criteria**	**Progress against performance/completion criteria**			**Description of management actions/monitoring in the reporting period (including where undertaken, any variations and the reasons for variation)**	**Visual observations, monitoring results and trends**	**Effectiveness of management actions, progressive improvements, and other comments (including reasons for non-completion)**
		Required completion year	**Anticipated/ actual completion year**	**Action completed?** (Yes/No)			
SUBSTAGE 8B - Establish stable final landform areas							
SUBSTAGE 8B the final landform is consistent with the Consent	The final landform is suitable for the final land uses and generally compatible with surrounding topography. No reduction in flood storage capacity, compared with pre-development conditions. The final landform incorporates geomorphological features to allow for the free draining discharge of clean water. Minimal sediment-laden run-off into the Nepean River.	2025	2024	See below	Extraction of the Substage 8B area commenced in Feb 2024	-	-
SUBSTAGE 8B The landform area is stable	Areas of active erosion are minimised.	2025	Late 2024	See below	Extraction of Substage 8B area has commenced.	-	-
SUBSTAGE 8C - Establish stable final landforms in the area							
SUBSTAGE 8C The final landform is consistent with the Consent	The final landform is suitable for the final land uses and generally compatible with surrounding topography. No reduction in flood storage capacity, compared with pre-development conditions.	2026	2025	See below	Extraction of the Substage 8C is yet to commence.	-	-

Table 4-4 2023 Landform Establishment, Stability and Growth Medium Rehabilitation Summary (page 7 of 10) (Source: 2023 SRRAPR, Ref [12])

Landform establishment, stability and growth medium summary							
Management actions	**Performance/completion criteria**	**Progress against performance/completion criteria**			**Description of management actions/monitoring in the reporting period (including where undertaken, any variations and the reasons for variation)**	**Visual observations, monitoring results and trends**	**Effectiveness of management actions, progressive improvements, and other comments (including reasons for non-completion)**
		Required completion year	**Anticipated/ actual completion year**	**Action completed?** (Yes/No)			
	The final landform incorporates geomorphological features to allow for the free draining discharge of clean water. Minimal sediment-laden run-off into the Nepean River.						
SUBSTAGE 8C The Landform is stable	Areas of active erosion are minimised.	2026	2025	See below	Extraction of the Substage 8C is yet to commence.	-	-
RESTORATION AREA 1 - Establish stable final landform areas							
RESTORATION AREA 1 The landform is stable	Areas of active erosion are minimised.	2024	2024	Yes	Reshaping, grading, and placing of timbers, and hydroseeding to HN526 has occurred. Weed spraying is occurring as is irrigation.	The cover crop and some weeds have reestablished	Generally good but we are awaiting emergence of the Hydroseeded HN526 bushes and trees
	No areas of active erosion as determined by: • no drills/gullies • no sheet erosion present • no tunnel erosion present.	2024	2024	No	There are no areas of active erosion. See Attachment A: Drainage, erosion and sediment control inspections record.	See Attachment A: Drainage, erosion and sediment control inspections record.	The area is relatively flat as was originally mined in the 1920's for the Sydney Harbour Bridge construction sand

Table 4-4 2023 Landform Establishment, Stability and Growth Medium Rehabilitation Summary (page 8 of 10) (Source: 2023 SRRAPR, Ref [12])

Landform establishment, stability and growth medium summary							
Management actions	**Performance/completion criteria**	**Progress against performance/completion criteria**			**Description of management actions/monitoring in the reporting period (including where undertaken, any variations and the reasons for variation)**	**Visual observations, monitoring results and trends**	**Effectiveness of management actions, progressive improvements, and other comments (including reasons for non-completion)**
		Required completion year	**Anticipated/ actual completion year**	**Action completed?** (Yes/No)			
STAGE 6 & 7, SUBSTAGES 8A-8C & RESTORATION AREA 1 - Establish soil suitability for establishment and growth of River Flat Eucalypt Forest (HN526)							
Apply woody debris and habitat materials (eg branches and leaves from cleared native vegetation).	Substage 8A area	2023	2024	yes	See Section 5.2.	See Section 5.2.	See Section 5.2.
	Substage 8B area	2024	2024	No	Extraction of the Substage 8B commenced in Feb 2024	-	
	Substage 8C area	2025	2025	No	Extraction of the Substage 8C is yet to commence.	-	
	Restoration Area 1	2023	2023	Yes	See Section 5.2.	See Section 5.2.	See Section 5.2.
Establish vegetation rehabilitation plots	Stage 6 area - two 20 x 20 m vegetation rehabilitation plots established (see Figure 3, below)	2023	2023	Yes	Two vegetation plots established and are in Figure 3 - see Section 2.5 below	-	Significant Flooding Events in has hampered continuity of this stage. Flood events have occurred on 22-24 March 2021, 2 March 2022 and 6 April 2022.
	Stage 7 area - five 20 x 20 m vegetation restoration plots established (see Figure 4, below)	2023	2023	Yes	Five vegetation plots established and are located in Figure 4 - see Section 2.5 below	-	As above
	Substage 8A-8C area 20 x 20 m vegetation restoration plots established (see Figures 9 & 10 below)	2025	2024	Yes for 8A No for 8B and 8C	One vegetation plot established in Substage 8A and is located in Figure 9 and shown in Figure 10 - see Section 2.5 below. The Plots will be established progressively as the final	-	These have just been established and it's too early to assess

Table 4-4 2023 Landform Establishment, Stability and Growth Medium Rehabilitation Summary (page 9 of 10) (Source: 2023 SRRAPR, Ref [12])

Landform establishment, stability and growth medium summary							
Management actions	**Performance/completion criteria**	**Progress against performance/completion criteria**			**Description of management actions/monitoring in the reporting period (including where undertaken, any variations and the reasons for variation)**	**Visual observations, monitoring results and trends**	**Effectiveness of management actions, progressive improvements, and other comments (including reasons for non-completion)**
		Required completion year	**Anticipated/ actual completion year**	**Action completed?** (Yes/No)			
					landform in each area is completed.		
	Restoration Area 1 – three 20 x 20 m three vegetation restoration plots established (see Figure 5)	2023	2023	Yes	Three vegetation plots established and fenced and located in Figure 5 and shown in Figures 6,7 & 8 - see Section 2.5 below	-	Weed control has been carried out post Hydroseeding with HN526
Soil analysis	Soil analysis at each vegetation plot once following establishment of the final landform: • pH • electrical conductivity • cation exchange capacity • exchangeable sodium percentage • organic matter • phosphorus and nitrate • magnesium and aluminium.	2024	2024	yes	Soil samples were collected from each vegetation restoration plot and from 4 locations where HN526 is currently established.	Laboratory reports are provided in Attachment C.	The results will be considered, and recommendations followed

Table 4-4 2023 Landform Establishment, Stability and Growth Medium Rehabilitation Summary (page 10 of 10) (Source: 2023 SRRAPR, Ref [12])

Landform establishment, stability and growth medium summary							
Management actions	**Performance/completion criteria**	**Progress against performance/completion criteria**			**Description of management actions/monitoring in the reporting period (including where undertaken, any variations and the reasons for variation)**	**Visual observations, monitoring results and trends**	**Effectiveness of management actions, progressive improvements, and other comments (including reasons for non-completion)**
		Required completion year	**Anticipated/ actual completion year**	**Action completed?** (Yes/No)			
Establish soil performance indicators	Upper and lower range performance indicators to be determined during first round of monitoring based on measurements in comparable soil types supporting HN526.	2024	2024	No	Soil analysis results have been carried out and are being assessed.	Upper and lower range performance indicators are provided in Attachment B.	The results will be considered, and recommendations implemented

Measures to be undertaken in 2024 were to include:

- Monitoring the efficacy of initiatives and procedures and make improvements; and
- Additional areas in the Stage 8 area have been restored as part of the facility's commitment to successful rehabilitation of the extraction. It has identified that the adjoining, mainly Lantana-infested areas would re-invade restored areas and the use of excessive amounts of weed-poisons would need to be employed. Therefore, MSS has undertaken additional areas of weed removal by stripping the weed mass (but leaving the eucalypts) and surface soils and burying them, and then mulching the area. The areas are then improved by sparsely planting additional Koala food tree species. These additional areas represent a 71% increase in the restored area that is not required by the Consent.

The Auditor considered the data provided in the summary table supported the conclusion that significant rehabilitation work had been undertaken at Menangle Quarry during 2023.

The 2023 SRRAPR[23] also advised that four new initiatives were to be included in the 2024 rehabilitation work comprising:

- Irrigating the rehabilitation areas when necessary, during post hydroseeding activities until the cover crop is established;
- Relocating the haul roads through already cleared adjoining grazing lands/areas so as to not allow quarry vehicles and machinery to transit through rehabilitated areas;
- Clearing weeds on Additional Restoration Areas 1 & 2 inland to the Restoration Area 1 and covering them with a thick mulch to provide a clean buffer, reducing weed migration into the substage excavation restoration areas; and
- Planting Trees considered suitable Koala food sources so that ultimately Koalas could be reintroduced into the corridor post-extraction.

The Auditor considered these initiatives are consistent with the rehabilitation work objectives and their effectiveness should be evaluated and documented in future annual review reports.

The 2023 SRRAPR[24] also advised that Menangle Quarry planted additional areas for operational and strategic purposes which added to ecological diversity across the site:

- In Stage 6, the Company voluntarily planted an area of some 1,250 m^2 for growing species harvested as Koala food for Symbio Wildlife Park in Helensburg, NSW (**Figure 4-8**);
- In Stage 7, the quarry planted a number of bund wall areas with a range of casuarinas and eucalypts to provide screening and increased post-extraction habitat areas (**Figure 4-9**). This additional 26,700 m^2 of additional Restoration Area represented a 46% increase in the tree-planted area above that required by the Consent;
- Restoration of a nearby Lantana-infested area to reduce the risk of Lantana re-invading restored areas and to reduce the use of excessive amounts of weedicides **(Figure 4-10**). This additional work involved stripping the weed mass (but leaving the eucalypts) and surface soils, burying them, and then mulching the area. The areas were then improved by sparsely planting additional Koala food tree species; and

[23] Section 2.3, Ref [12]
[24] Section 2.3, Ref [12]

- These additional areas represent a combined 71% increase in the restored area above that required by the Consent.

Figure 4-8 Stage 6 Restoration Area & Nearby Koala Food Plantation (Source: Fig 3, Ref [12])

Figure 4-9 Stage 7 Restoration Area & Additional Restoration Area (Source: Fig 4, Ref [12])

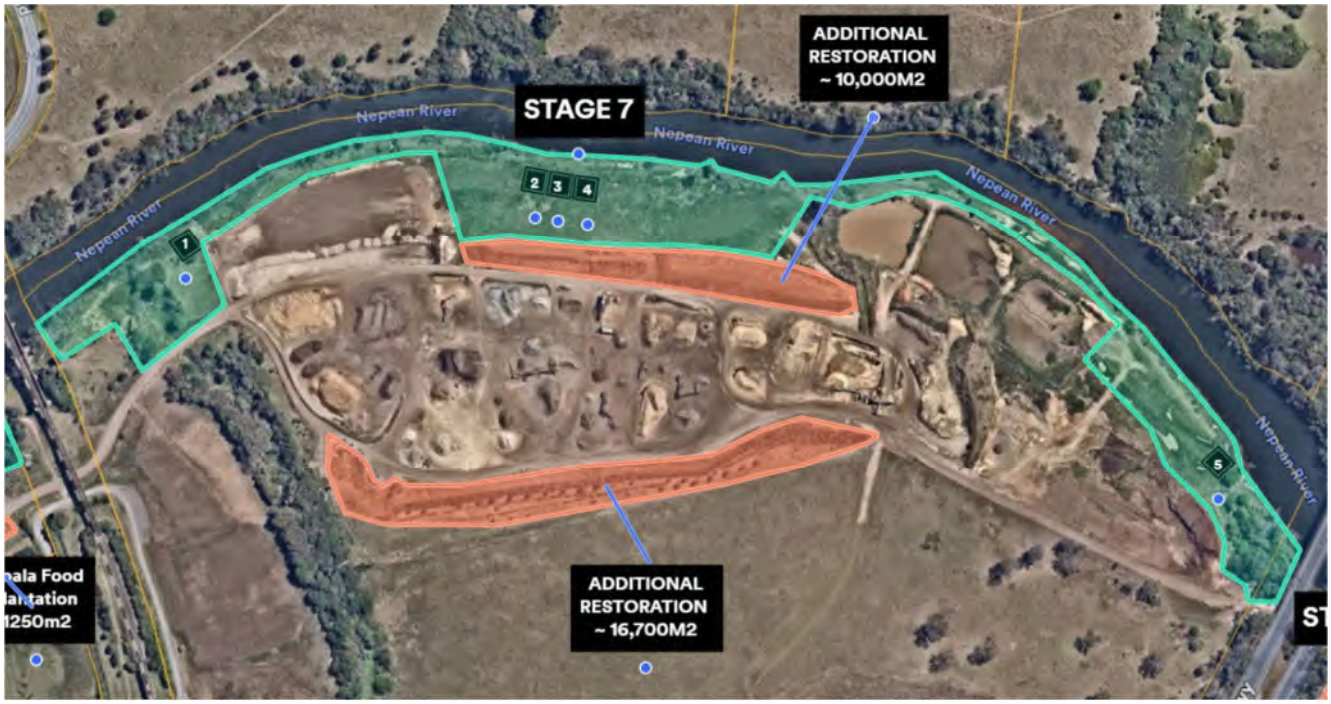
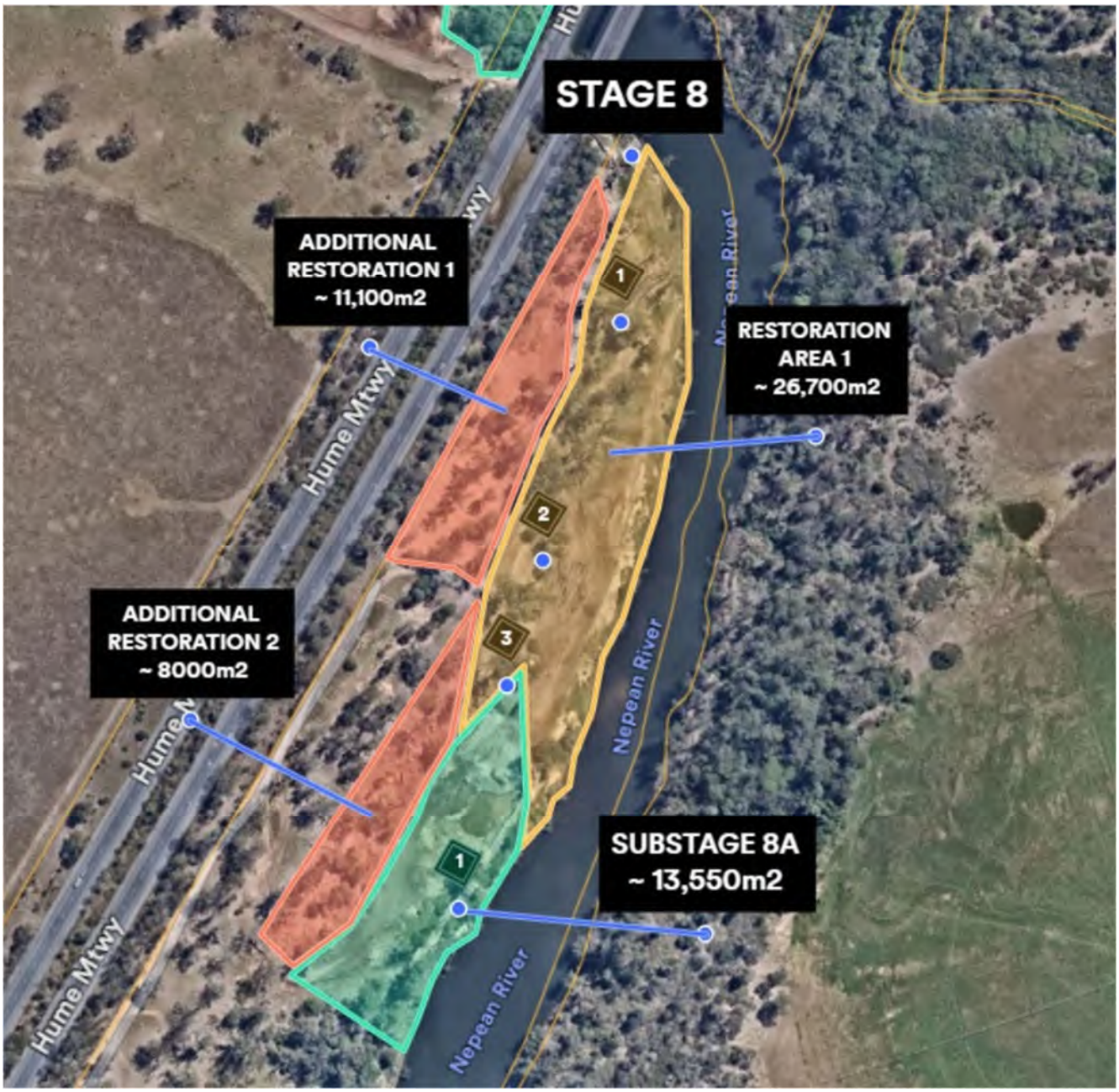


Figure 4-10 Stage 8 Restoration Area 1 with Additional Restored Areas (Source: Fig 4, Ref [12])



The Auditor considered these initiatives are consistent with the rehabilitation work objectives and their effectiveness should be evaluated and documented in future annual review reports.

4.6.3 Biodiversity Management Measures

The biodiversity management measures documented in the 2023 SRRAPR[25] provided results on the effectiveness of management actions, progressive improvements, and other comments (including reasons for non-completion) for substages 8A - 8C and restoration area 1. A copy of the biodiversity rehabilitation and restoration summary provided by the 2023 SRRAPR is presented in **Table 4-5**.

Measures to be undertaken in 2024 are to include:

- Ongoing weed management in Restoration Area 1, completed Substage 8A and soon to be completed Substage 8B;
- Monitoring soil stability and drainage;
- Ongoing hydroseeding and monitoring of any infill requirements;
- Adding woody debris;
- Establishment of required monitoring plots; and
- Monitoring and adding nest boxes.

The Auditor considered the data provided in the summary table supported the conclusion that significant rehabilitation work had been undertaken at Menangle Quarry during 2023.

4.6.4 Weed Monitoring

The weed monitoring report provided in the 2023 SRRAPR[26] advised that:

- The weed management activities completed in 2023 were:
  - Campaign weed spraying and hand removal; and
  - Mulching methods were employed to minimise weed re-emergence.
- Progress against weed performance and completion criteria were reported to have been met for the control of lantana and privet in Stage 6 but not in stages 7 and 8.
- Weedy areas have been drastically reduced given the strip-and-bury initial protocol. It is too early to tell how the hydroseeding interrelates to the re-emergence of weed species.
- Measures to be taken in 2024: Ongoing weed management in Restoration Area 1, Completed Substage 8A and soon to be completed Substage 8B will be a priority.

The report[27] also advised that an EMM ecologist Callan Douchkov conducted a weed survey on 6 March 2024. The survey was undertaken via walked transects at 20 m spacings across restoration and rehabilitation areas. Transect separation varied slightly where vegetation density and steep slope gradients impeded access. Weed species were mapped via GPS recordings in field via point records (for infestations 1 m^2 to 25 m^2), and polygon records for infestations greater than 25 m^2. Polygon records were recorded by walking the boundary of each infestation, or estimated boundaries in the case of prohibited access by dense vegetation.

[25] Section 3, Ref [12]
[26] Section 4, Ref [12]
[27] Section 2.2, Ref [13]

Table 4-5 2023 Biodiversity Rehabilitation and Restoration Summary (page 1 of 5) (Source: 2023 SRRAPR, Ref [12])

Biodiversity rehabilitation and restoration summary							
Management actions	**Performance/completion criteria**	**Progress against performance/completion criteria**			**Description of management actions/monitoring in the reporting period** (including where undertaken, any variations and the reasons for variation)	**Visual observations, monitoring results and trends**	**Effectiveness of management actions, progressive improvements, and other comments** (including reasons for non-completion)
		Required completion year	**Anticipated/ actual completion year**	**Action completed** (Yes/No)			
SUBSTAGE 8 - Vegetation establishment for soil stabilisation							
Initial planting/seeding for soil stabilisation	**SUBSTAGE 8A area** Vegetation established to stabilise soils in Substage 8A area substages that have been completed: • Native species from HN526 at one per square metre or greater. Or • Initial cover crop with 70% cover.	2022	2024	Yes both	The start of extraction had been delayed until Sept 2023, delaying Substage 8A planting/seeding. The area, post extraction, was Hydroseeded with the HN526 seed mix plus a cover crop in Dec 2023 Floristic monitoring was completed in the Substage 8A plots in accordance with BRMP Section 8.4.1. Please see Ecologist Report in Attachment E	See Attachment E for details.	See Attachment E for details.
	SUBSTAGE 8B area	2024	Mid-late 2024	No	Extraction of the Substage 8B area commenced in Feb 2024	-	-

Table 4-5 2023 Biodiversity Rehabilitation and Restoration Summary (page 2 of 5) (Source: 2023 SRRAPR, Ref [12])

Biodiversity rehabilitation and restoration summary							
Management actions	**Performance/completion criteria**	**Progress against performance/completion criteria**			**Description of management actions/monitoring in the reporting period** (including where undertaken, any variations and the reasons for variation)	**Visual observations, monitoring results and trends**	**Effectiveness of management actions, progressive improvements, and other comments** (including reasons for non-completion)
		Required completion year	**Anticipated/ actual completion year**	**Action completed** (Yes/No)			
	SUBSTAGE 8C area	2025	2025	No	Extraction of the Substage 8C is yet to commence.	-	-
	RESTORATION AREA 1: Vegetation established to stabilise soils in area: • Native species from HN526 at one per square metre or greater. Or • Initial cover crop with 70% cover.	2023	2023	Yes	The area has been restored and Hydroseeded with HN526 species list. Floristic monitoring (see BRMP Section 8.4.1) in the Restoration Area 1 plots (see BRMP Figure 7.1).	See Attachment E for details.	See Attachment E for details.
SUBSTAGE 8A - Area vegetation management							
SUBSTAGE 8A Vegetation management, including planting/seeding of native species.	Native plant species are characteristic of HN526. The vegetation structure is recognisable as, or is trending towards, HN526. Total foliage cover of species allocated to Tree (TG) growth form; Shrub (SG) growth form; Grass and Grasslike (GG) growth form; and Forb (FG) growth form	2028	2028	No	Landform and soil stabilization Weed Management Hydroseeding Added woody debris Floristic sampling (see BRMP Section 8.4.1) in the Substage 8A plots (see BRMP Figure 7.1).	See Attachment E for details.	See Attachment E for details.

Table 4-5 2023 Biodiversity Rehabilitation and Restoration Summary (page 3 of 5) (Source: 2023 SRRAPR, Ref [12])

Biodiversity rehabilitation and restoration summary							
Management actions	**Performance/completion criteria**	**Progress against performance/completion criteria**			**Description of management actions/monitoring in the reporting period** (including where undertaken, any variations and the reasons for variation)	**Visual observations, monitoring results and trends**	**Effectiveness of management actions, progressive improvements, and other comments** (including reasons for non-completion)
		Required completion year	**Anticipated/ actual completion year**	**Action completed** (Yes/No)			
	are trending towards the benchmark ranges. See Attachment G for details.						
Vegetation management	Completion criteria: levels of ecosystem function have been established that demonstrate that the vegetation is self-sustaining or is trending towards self-sustainability. Performance indicators: • The cover and species richness of the groundcover is stable or increasing. • Evidence of plant reproduction and regeneration is present. See Attachment G for details.	2033	2033	No	Landform and soil stabilization Weed Management Hydroseeding Added woody debris Floristic sampling (see BRMP Section 8.4.1) in the Substage 8A plots (see BRMP Figure 7.1).	See Attachment E for details.	See Attachment E for details.
SUBSTAGE 8B- Vegetation management							
SUBSTAGE 8B Vegetation management, including	As for Substage 8A area.	**Initial planting: 2029**	**Initial planting: 2029**	**No**	Extraction of the Substage 8B is yet to finish.	-	-

Table 4-5 2023 Biodiversity Rehabilitation and Restoration Summary (page 4 of 5) (Source: 2023 SRRAPR, Ref [12])

Biodiversity rehabilitation and restoration summary							
Management actions	**Performance/completion criteria**	**Progress against performance/completion criteria**			**Description of management actions/monitoring in the reporting period** (including where undertaken, any variations and the reasons for variation)	**Visual observations, monitoring results and trends**	**Effectiveness of management actions, progressive improvements, and other comments** (including reasons for non-completion)
		Required completion year	**Anticipated/ actual completion year**	**Action completed** (Yes/No)			
planting/seeding of native species.		**Completion: 2034**	**Completion: 2034**				
SUBSTAGE 8C - Vegetation management							
SUBSTAGE 8C Vegetation management, including planting/seeding of native species.	As for Substage 8A area.	Initial planting: 2030 Completion: 2035	Initial planting: 2030 Completion: 2035	No	Extraction of the Substage 8C is yet to commence.	-	-
RESTORATION AREA 1 - Vegetation management							
RESTORATION AREA 1 Vegetation management, including planting/seeding of native species.	Native plant species are characteristic of HN526. The vegetation structure is recognisable as, or is trending towards, HN526. Total foliage cover of species allocated to Tree (TG) growth form; Shrub (SG) growth form; Grass and Grasslike (GG) growth form; and Forb (FG) growth form are trending towards the benchmark ranges.	2028	2028	No	Landform and soil stabilization Weed Management Hydroseeding Added woody debris. Floristic sampling (see BRMP Section 8.4.1) in Restoration Area 1 plots (see BRMP Figure 7.1).	See Attachment E for details.	See Attachment E for details.

Table 4-5 2023 Biodiversity Rehabilitation and Restoration Summary (page 5 of 5) (Source: 2023 SRRAPR, Ref [12])

Biodiversity rehabilitation and restoration summary							
Management actions	**Performance/completion criteria**	**Progress against performance/completion criteria**			**Description of management actions/monitoring in the reporting period** (including where undertaken, any variations and the reasons for variation)	**Visual observations, monitoring results and trends**	**Effectiveness of management actions, progressive improvements, and other comments** (including reasons for non-completion)
		Required completion year	**Anticipated/ actual completion year**	**Action completed** (Yes/No)			
	See Attachment E for details.						
Vegetation management	Completion criteria: levels of ecosystem function have been established that demonstrate that the vegetation is self-sustaining or is trending towards self-sustainability. Performance indicators: • The cover and species richness of the groundcover is stable or increasing. • Evidence of plant reproduction and regeneration is present. See Attachment E for details.	2033	2033	No	Floristic sampling (see BRMP Section 8.4.1) in the Restoration Area 1 (see BRMP Figure 7.1).	See Attachment E for details.	See Attachment E for details.

The weed monitoring survey primarily targeted the mapping of Lantana (Lantana camara), and Privet (Ligustrum sinense and Ligustrum lucidum). Observations of other weed species listed by the NSW Biodiversity Assessment Method (**BAM**) High Threat Weed (**HTW**) list were recorded to assess for weed species which were either new to the project or were forming or were likely to form a significant infestation within the project site. Weed species new to the project site and likely to/are forming a significant infestation were classified as a 'novel weed species' and are included in the annual weed mapping program.

The weed monitoring results are presented in **Table 4-6** and mapped in **Figures 4-11** and **4-12**. The status of weed management at the time of the 6/03/24 survey is summarised in **Table 4-7**. The report advised that:

- Weed monitoring undertaken for this 2023 report constituted the first year of weed monitoring results. A comparison to previous year's survey results was therefore not possible. The 2023 weed monitoring results will be used as a baseline for comparison of the following years survey results; and
- In general, the rehabilitation and restoration areas of the site are heavily impacted by weed invasion. Two species previously recorded in project vegetation surveys (Balloon Vine and Trad) were observed to have established dense infestations in select areas of the site, but do not qualify as novel weed species as were also observed during the BRMP. However, due to the invasiveness of both species and observed prevalence on site they have therefore been identified as additional priority weed species to be managed as part of weed control efforts.

The Auditor considered the data provided in the weed monitoring report supported the conclusion that weed management and monitoring will be an important part of rehabilitation work at Menangle Quarry and it will be important for the approved plans be implemented.

4.6.5 Floristic Monitoring

The 2023 SRRAPR[28] advised that biodiversity restoration and rehabilitation outcomes are monitored annually using permanent 20 m by 20 m floristic plots quadrats in the restoration and rehabilitation areas. The parameters monitored are:

- Native species diversity;
- Tree, shrub, grass, and forb diversity and abundance for both native and exotic species;
- Litter cover within five 1 m^2 subplots within each 20 m by 20 m floristic plot;
- Photographic monitoring points; and
- Regeneration of overstorey species.

Menangle Quarry established initial rehabilitation plots in each of these areas, where rehabilitation is more advanced than in the surrounding areas. The monitored plots are:

- Stage 6: Plot 6.1 and Plot 6.2 (**Figure 4-8**);
- Stage 7: Plot 7.1, Plot 7.3 (as representative of Plot 7.2–7.4), and Plot 7.5 (**Figure 4-9**); and
- Stage 8A extraction/rehabilitation area: Plot 8A.1 and Stage 8 Restoration Area 1: Plot 8R1.1 to Plot 8R1.3 (**Figure 4-10**).

[28] Section 2.1, Ref [13]

Table 4-6 Weed Monitoring Results for 6/03/24 Survey (Source: Table 3.2, Ref [13])

Date	Area (eg Substage 8A)	Surveyed area (ha)	Lantana			Privet			Novel weed species			
			Cover (ha)	Cover (%)	Locations Patches >25 m²: see map below Patches 1–25 m²: see map below or provide coordinates	Cover (ha)	Cover (%)	Locations Patches >25 m²: see map below Patches 1–25 m²: see map below or provide coordinates	Species	Cover (ha)	Cover (%)	Locations Patches >25 m²: see map below Patches 1–25 m²: see map below or provide coordinates
6/3/2024	Stage 6	2.3	0	0	N/A	0	0	N/A	N/A	N/A	N/A	N/A
6/3/2024	Stage 7	7.41	0.36	80	See maps below	0.41	80	See maps below	N/A	N/A	N/A	N/A
6/3/2024	Stage 8	6.51	0.21	40	See maps below	0.1	100	See maps below	N/A	N/A	N/A	N/A

Table 4-7 Weed Management Summary for 2023 (Source: Table 3.3, Ref [13])

Weed	Coverage last year (ha)	Coverage this year (ha)	% change	Requirement met? (Yes/No)
Lantana (*Lantana camara)*	N/A	0.58	N/A	N/A
Small-leaved Privet (*Ligustrum sinense*) Broad-leaf Privet (*Ligustrum lucidum*)	N/A	0.41	N/A	N/A

N/A: trend not available as first year of mapping.

Figure 4-11 Lantana Infestation Location (Source: Figure 3.1, Ref [13])

Figure 4-12 Weed Mapping 6/03/24

(Source: Figure 3.1, Ref [13])

Floristic monitoring was undertaken by EMM ecologists Paul Rossington and Callan Douchkov on 5 March 2024. Floristic monitoring was carried out within the plots established and maintained by Menangle Quarry to provide information on early rehabilitation progress in these areas. The ecologist reports that[29]:

- Particularly in the Stage 8 area, the rehabilitation and restoration program had only recently commenced;
- The floristic monitoring indicated that up to 8 of the 24 target species characteristic of River-Flat Eucalypt Forest were present in the plots. The early establishment of a greater number of River-Flat Eucalypt Forest species will greatly assist in the long-term development of a high-quality vegetation community;
- While the thick layer of mulch has supressing weed growth, it also appears to be inhibiting the growth of species characteristic of River-Flat Eucalypt Forest; and
- It was recommended that the mulching strategy be modified to improve the establishment of River-Flat Eucalypt Forest species. This would be assisted by additional seeding or planting. The weed management regime also needed to be modified as part of changing the mulching strategy.

The Auditor has included the recommendations made by the ecologist into the recommendations included in the compliance performance assessment documented in **Section 4.11**.

4.6.6 Nest Box and Woody Debris Program

The nest box and woody debris report[30] provided in the 2023 SRRAPR advised that:

- Since April 2023, 35 nest boxes were installed in the restoration areas adjacent to Stages 8A to 8C.
- On 10 January 2024, a representative sample of 8 nest boxes were visually monitored using a manlift for recent signs of habitation (e.g. animal sightings). Thus far only 3 boxes had been used by birds and no mammal habitation was suspected.
- Nest box performance in terms of percentage functional for the different nest box types was: double chamber microbat 2.5%, possum front entry 6.6%, sugar / squirrel rear entry 0% and large owl 0%.
- Woody debris and habitat materials (e.g. smaller branches and leave material) are placed on the Stage 8 substage rehabilitation and restoration areas.
- Woody debris was placed in Restoration Area 1 and Extraction Substage 8A during the reporting period.
- Measures proposed by Menangle Quarry to be undertaken in 2024 comprised:
  - Continue to install and monitor the required nest boxes 12 months before entering an extraction phase; To safely install all nest boxes on all phases now requires substantial clearing, in many cases, years before the arrival of extraction; and
  - Continue the rehabilitation program placement of woody debris of all sizes (but particularly large trunks) into rehabilitated extraction areas.

[29] Section 3, Ref [13]
[30] Section 5, Ref [12]

4.7 Stakeholder Consultation Outcomes

The Auditor considered that all stakeholder inputs to this IEA, as described in **Section 3.6**, have been addressed for the reasons given in the following sub-sections.

4.7.1 Campbelltown City Council

In feedback provided on 9 and 22 October 2024, Greg Woods the Team Leader for Development & Environmental Compliance advised that the facility is not in Campbelltown City Council's LGA and that Council was not aware of any direct incidents involving the facility.

However, Council is concerned about environmental impacts on water quality in the Nepean River, particularly at Nepean River Reserve located directly opposite the northern part of the facility as shown in **Figure 4-13**. Council advised that the Reserve is scheduled for natural swim site activation. However, Council considered the level of microbial and faecal contamination in the river water at this location is of immediate concern for the safety and suitability of the Reserve as a swim site, with both dry and wet weather readings over the past year occasionally exceeding the trigger value for safe primary water contact.

In a 22 October 2024 email, Council advised that water quality records at the Menangle Bridge sampling location (**Figure 4-13**) were collected weekly between 2006 and 2020 and tested for physiochemical and microbial parameters. Since 2022 the testing has included algal community composition and other pathogens and human DNA indicators. Ad-hoc microbial sampling has also occurred following heavy rainfall (>10mm). A copy of the surface water quality testing at the Menangle Bridge sampling location is provided in **Appendix C**. A summary of the surface water sampled at Menangle Bridge between 2006 to 2020 and 2022 to 2024 is provided in **Table 4-8**.

The surface water sampled at Menangle Bridge on 30/09/24 and 1/10/24 measured:

- E.coli = 140 and 19 CFU/100mL;
- Faecal coliform = 140 and 19 CFU/100mL; and
- Enterococci = 1,400 and 49 CFU/100mL.

Council's indicates that the water quality in the Nepean River at Menangle Bridge is contaminated by human waste (i.e. sewage) as indicated by the elevated levels of nitrogen based substances and pathogens. These substances are most likely caused by sewer overflows and runoff from urban areas in the Campbelltown LGA. These substances are not associated with sand and soil extraction from the facility.

There appears to be some improvement in the water quality over time, as indicated by lower average concentrations for nitrogen-based substances and pathogens measured between 2020 – 2024 and 2006 – 2020. It is possible that this improvement is the result of improvements made by Sydney Water to the sewage system that may have reduced the number and severity of sewer overflows.

The data collected by Campbelltown Council indicate that operations at the facility are not having a measurable effect on water quality in the Nepean River adjacent to and downstream of the facility.

Figure 4-13 Campbelltown Council Menangle Bridge Surface Water Sample Location

Table 4-8 Summary of Water Quality Testing at Menangle Bridge Sampling Location

Parameter	Period	Units	Minimum	Maximum	Average	ANZECC 2000 Trigger Levels (1)
pH	2006-2020	pH units	5.71	10.26	7.71	6.5 – 8.0
Dissolved Oxygen	2006-2020	% saturation	12.9	152	85	85 – 110
Electrical Conductivity	2006-2020	µS/cm	52	26,600	403	125 – 2,200
Turbidity	2006-2020	NTU	0.10	156	5.7	6 – 50
Total Nitrogen	2006-2020	µg/L	100	7,100	556	500
	2022-2024		310	400	357	
Total Phosphorus	2006-2020	µg/L	10	420	30.6	50
	2022-2024		11	160	30	
NO2+NO3	2006-2020	µg/L	10	600	112	40
	2022-2024		10	510	134	
TKN	2006-2020	µg/L	100	7,100	436	--
	2022-2024		170	690	308	--
Faecal coliforms	2006-2020	CFU/100mL	1.0	45,000	305	Not present in 100mL sample
Enterococci	2006-2020	CFU/100mL	1.0	6,700	132	Not present
	2022-2024		11	3,000	454	
Chlorophyll-a	2006-2020	µg/L	1.0	147	5.0	5
	2022-2024		1.1	24.1	4.8	

Note:

1) Default trigger values for physical and chemical stressors for south-east Australia for slightly disturbed ecosystems in a lowland river (Tables 3.3.2 & 3.3.3, ANZECC 2000 Volume 1).

Benedict advised during the on-site meeting on 24 October 2024 that operations at the Menangle Quarry do involve the importation of compost and cow manure with about 500 m^3 present at any one time. The compost and cow manure is placed in a single area located about 300m from the edge of the Nepean River and does not remain stockpiled for long as it is continuously being used and replenished.

The Auditor considered that the use of compost and cow manure at the quarry was likely to pose a low risk to water quality in the Nepean River, but considered that some additional protocols could be implemented to further reduce the risk of impact. These additional protocols are:

1) The compost and cow manure stockpiles need to be located in an area located not less than about 300m from the edge of the Nepean River and in an area not subject to flooding or high surface water flow;
2) The compost and cow manure stockpiles are to be surrounded by earthen bunds that will prevent the escape of rainwater that comes in contact with the compost or cow manure.
3) A stormwater pond should be constructed to store runoff from the compost and cow manure stockpiles with sufficient capacity so that rainwater coming in contact with the compost and cow manure does not escape from the area; and
4) Water from the stormwater pond may be beneficially reused for dust suppression at the quarry during dry periods.

4.7.2 DPHI

In feedback provided on 23 October 2024, Katrina O'Reilly from the DPHI requested the Auditor to contact organisations in addition to the State Government agencies. These additional organisation comprised:

- BCSG;
- The local aboriginal land council;
- The DPHI Water Group;
- Heritage Council of NSW; and
- NSW Resources.

These organisations were all contacted as shown by the data provided in **Table 3-13**.

The DPHI also specified matters that the Auditor needed to focus on during the audit, these being:

- Compliance with approved extraction boundaries, stages, areas, depths and limits;
- Compliance with all commitments, reporting and monitoring requirements within management plans;
- Management, monitoring and responses of complaints register; and
- Compliance with conditions relating to rehabilitation and riparian management.

These matters have been considered by the Auditor and the results documented in **Section 4.10**. With regard to the particular issues mentioned by DPHI the following feedback was provided by MSS[31]:

- Compliance with approved all extraction boundaries, stages, areas, depths and limits: MSS marked out onsite extraction boundaries for each substage. The boundaries and the GPS coordinates are submitted to the Planning Secretary and the boundaries are clearly marked at all times that allows operating staff to clearly identify the boundaries as per consent condition A22.

  Before commencing the next stage notification is sent to the Planning Secretary of expected commencement date for the new stage. Previous stages are rehabilitated before moving on to the next stage. Production data is submitted to MEG for the calendar year as per consent conditions A37 and A38 and no more than 150 000 tonnes of material is extracted from the site in a calendar year as per condition consent A24.
- Compliance with all commitments, reporting and monitoring requirements within management plans: Each management plan has been recently approved by the Planning Secretary following the submission on the annual review in 2023. MSS has an 'annual compliance conditions schedule' which outlines all commitments, reporting and monitoring requirements to be followed. This assists MSS in being compliant with all requirements.
- Management, monitoring and responses of complaints register: The complaints register is updated on a monthly basis and published on the Benedict website as per consent condition D15 (a) (viii).
- Compliance with conditions relating to rehabilitation and riparian management: As part of the 2023 Annual Review Report an appendix report was included 'site rehabilitation and restoration annual progress report'. This report gives an update on the rehabilitation onsite as outlined in the Biodiversity Rehabilitation Management Plan and how MSS is meeting compliance requirements outlined in this plan. The progress report contains a floristic survey which is completed by EMM Consulting outlining the progress of restoration and rehabilitation on the site. As it is completed by EMM Consulting it is independently completed. Further to this EMM Consulting also complete a review of the progress report giving a degree of independence to the report.

4.7.3 NSW EPA

In feedback provided on 21 October 2024, Matt Davidson from the Operations Group advised that the EPL was varied on 1/07/24 to include additional noise monitoring requirements relating to Stage 8 in line with the Consent.

The NSW EPA also advised that they did not have any major concern with operations at the Facility, however, the following matters needed to be considered by the audit:

- Receipt and processing/use of waste streams;
- Air quality impacts, particularly management and monitoring of dust generation; and
- Compliance with noise limits and monitoring requirements.

These matters have been considered by the Auditor and the results documented in **Section 4.10**.

[31] Ref [28]

4.7.4 Wollondilly Council

In feedback provided on 23 October 2024, Corrie Swanepoel, Manager Development Services, advised that the following matters needed to be considered by the audit:

- Confirm/review any riparian restoration requirements under the conditions of consent;
- Confirm if a Controlled Activity Approval (CAA) under the Water Management Act has been issued;
- Consider requirements of Vegetation Management Plans;
- Include a review of impacts caused by flooding on site operation; and
- During the reporting period Council received a customer request/enquiry regarding noise from fireworks during an event at the site. Whilst this does not fall within the parameters of the EPL it may be worth noting.

These matters have been considered by the Auditor and the results documented in **Section 4.10**.

4.8 Complaints

Condition D9(b) of the Mod 2 Consent required a comprehensive review of complaints records of the development over the previous calendar year, including a comparison of these results against the: (i) relevant statutory requirements, limits or performance measures/criteria; (ii) requirements of any plan or program required under this consent; (iii) monitoring results of previous years; and (iv) relevant predictions in the documents listed condition A7(c).

Quarrying in Stage 8 commenced on 4 September 2023. The 2023 Annual Review Report[32] issued by Benedict during the Audit Period advised that complaints monitoring had been carried out monthly since 2001, with the results posted on the Company website at www.benedict.com.au.

The Auditor reviewed the data provided on the Company's website and found that the only complaint recorded to have occurred prior to the Audit Period was one complaint received on 14 December 2022, which is outside the Audit Period. The complaint concerned the NSW EPA receiving a dust complaint earlier that day by someone driving on the Hume Highway. The complaint made to the NSW EPA concerning dust impacts originating from Menangle Quarry. The response made by Menangle Quarry to the EPA was:

- No activities occurring at 3pm under or near the Hume Highway;
- Production was running in the normal production area hundreds of metres to the west;
- The wind direction measured from the on-site weather station as a west-southwest (WSW) wind, which meant that dust was not blowing in the direction of the Hume Highway from the Weston Aluminium production area;
- Other sources nearby where dust could come from; and
- Continued use of watercart onsite as we do now.

The complaint register for the 2023 and 2024 years recorded no complaints.

[32] Section 3, Ref [15]

The only other record of a complaint during the Audit Period was that Wollondilly Council advised that they had received a customer request/enquiry regarding noise from fireworks during an event at the site. The Auditor understands that these fireworks were associated with an organised social event for Benedict employees. Menangle Quarry has since addressed this complaint by not having any more social events at the site involving fireworks.

The Auditor considers the weight of evidence supports the conclusion that reasonable measures have been taken by Menangle Quarry to minimise complaints regarding the Stage 8 operation. The Auditor is not aware of any other complaints having been made by off-site receptors during the Audit Period. The Auditor considers the relatively small number of complaints made during the Audit Period supports the conclusion that operations at the site have been well managed.

4.9 Incidents

The 2023 Annual Review Report[33] advised there were no incidents associated with quarry operations occurred during the Audit Period, which was consistent with information provided in the 2023 Annual Review Report. The Auditor considers the lack of incidents during the Audit Period supports the conclusion that operations at the site have been well managed.

However, two flood events occurred, one on 8 April 2024 and the second on 8 June 2024. Phones taken by MSS of the extracting pit on those days are provided in **Figure 4-14** and **4-15**.

Figure 4-14 Flooding of Extraction Pit on 8 April 2024 (Source: Ref [31])

[33] Section 4, Ref [15]

Figure 4-15 Flooding of Extraction Pit on 8 June 2024 (Source: Ref [31])

4.10 Compliance Performance

Condition D9 of the MOD 2 Consent requires the preparation of an annual review report documenting the environmental performance of the Stage 8 quarrying operations at Menangle Quarry. The first annual review report was prepared by Benedict Industries for operations conducted during the 2023 calendar year and was issued on 22 April 2024 (Ref [15]).

4.10.1 Compliance Performance in 2023 Annual Review Report

The 2023 Annual Review Report was the first annual review report for the Stage 8 work at Menangle Quarry. The report advised, among other things, that:

- A full compliance assessment with all Mod 2 Consent requirements was provided in Appendix A of the report. No non-compliances were identified;
- There were no significant incidents or lost time through injury in 2023;
- 72,541 tonnes of soil were extracted from Stage 8 during September to December 2023;
- Water was extracted by water pump from the Nepean River for dust suppression purposes. This activity was recorded and interfaced with WaterNSW, with a copy of the September – December 2023 records provided in Attachment I of the 2023 Annual Review Report;

- At the end of 2023, the Stage 8 quarry was in its Infancy. The only final rehabilitated landform was in substage 8A;
- The difference between the commencement levels and the final landform levels was a reduction in landform levels ranging between 2.08 m and 5.1 m, with the final average landform reduction in substage 8A being 4.198 m. This meant that the flood storage capacity at Menangle Quarry had not been compromised;
- At the end of 2023, implementation of the noise and air quality management systems was their infancy and baseline data has been gathered. Later monitoring data will be reviewed and documented in the 2024 Annual Review Report;
- The Stage 8 development generates little waste by-products. Clearing of land generates useful rehabilitation vegetation which is stored and reused. Weed residues such as Lantana and the like are buried in the extraction hole. Any other debris that might occasionally arrive onsite via elevated river levels is taken to the site rubbish bin and removed by the regular contractor service; and
- Every effort has been made to comply with the operating and performance measures. Operational and management performance is measured over a four-month period. It has been onerous to create and implement all the required elements, however, as the development has been staged so will the rollout and reporting. There will be a review of the management plans within three months of the 2023 Annual Review Report and the provision of DPHI feedback. A full year of operations will feed into the 2024 Annual Review Report lodgement and all elements of the Consent and Management Plans will have been engaged.

4.10.2 Independent Audit of Compliance Performance

This IEA has audited the data provided in the 2023 Annual Review Report together with subsequent data covering the Audit Period for compliance with the Mod 2 Consent, the EPL and feedback provided by stakeholders. This additional data has included:

- The documentation listed in **Section 2.6**;
- Feedback provided by stakeholders as documented in **Section 4.7**;
- Data provided by the NSW EPA public registers;
- Observations made by the Auditor during the site inspection and discussions with Menangle Quarry personnel; and
- Feedback provided by Audit Team specialists documented in **Appendix D**; and
- Data reviews made by the Auditor and documented in this report.

As previously discussed in **Section 3.2**, the Auditor prepared two detailed audit checklists (spreadsheets) to assess and track compliance with the Mod 2 Consent and the EPL. Consideration was also given to feedback provided by stakeholders. Detailed documentation of the checklist results is provided in **Appendix E**, with a summary of statutory compliance outcomes from the audit provided in **Table 4-9**.

Table 4-9 Summary of Statutory Compliance

Statutory Approval / Licence	Subject	Number of Conditions	Compliance	Non-compliance	Not triggered
Mod 2 Consent	Admin. (conditions A1 – A39)	39	26	0	12
	Early works (conditions B1 – B3)	3	3	0	0
	Noise (conditions B4 – B9)	6	6	0	0
	Air quality (conditions B10–B16)	7	7	0	0
	Meteorological monitoring (condition B17)	1	1	0	0
	Soil & water (conditions B18–B42)	25	25	1	0
	Transport (conditions B43–B57)	15	15	0	0
	Heritage (conditions B58 – B64)	7	7	0	0
	Biodiversity and Rehabilitation (conditions B65 – B89)	25	25	0	0
	Visual (condition B90)	1	1	0	0
	Waste (conditions B91 – B92)	2	2	0	0
	Liquid storage (condition B93)	1	1	0	0
	Dangerous Goods (condition B94)	1	1	0	0
	Bushfire management (condition B95)	1	1	0	0
	Additional procedures (conditions C1 – C4)	4	4	0	0
	Environmental management (conditions D1 – D4)	4	4	0	0
	Revision of strategies, plans and programs (conditions D5 – D6)	2	2	0	0
	Reporting and auditing (conditions D7 – D14)	8	7	0	1
	Access to information (condition D15)	1	1	0	0
EPL 3991	Pollution of waters (condition L1.1)	1	0	0	1
	Waste (conditions L2.1 – L2.6)	6	6	0	0
	Noise limits (conditions L3.1–L3.6)	6	4	0	2
	Hours of operation (condition L4.1)	1	1	0	0
	Potentially offensive odour (condition L5.1)	1	1	0	0
	Operating conditions (conditions O1.1 – O4.2)	6	6	0	0
	Monitoring and recording (conditions M1.1 – M3.3)	10	9	0	1

Statutory Approval / Licence	Subject	Number of Conditions	Compliance	Non-compliance	Not triggered
	Reporting (conditions R1.1–R3.4)	13	7	0	6
	General (conditions G1.1–G1.3)	3	3	0	0
	Special (conditions E1.1 – E1.5)	5	1	0	4
Totals		**205**	**177**	**0**	**28**

Legend:

Non-compliances

The outcome of the audit was that:

- 205 statutory conditions needed to be met by the Stage 8 work at the Menangle Quarry;
- 27 of the conditions were not triggered;
- The remaining 178 conditions were triggered and compliance was achieved for practically all conditions. The one exception was condition B22, which requires temporary bores to be drilled or augered progressively in each Substage to determine the local water table position immediately prior to commencing extraction in each Substage. To address this issue, temporary bores should be drilled in the next substage to assess whether this condition is necessary because the operational risk to groundwater is considered low;
- The Auditor considered all triggered audit issues have a negligible to low risk level; and
- The status of 147 statutory conditions are considered to pose a negligible risk level, with 31 conditions considered to pose a low risk level.

The Auditor assigned low risk levels to conditions where a recommendation has been made that needs to be followed up in future IEAs. A summary of these conditions and recommendations made by the Auditor is provided in **Table 4-10**.

Table 4-10 Summary of Auditor Recommendations for Future Environmental Compliance Work for Stage 8 of the Consent (page 1 of 7)

No.	Condition	Observation	Recommendation	Risk Level
A18	The Applicant must ensure that any weed control activities undertaken within the Nepean River Buffer Zone: (a) are limited to Weed removal techniques that use hand-held tools; and (b) minimise ground disturbance to the greatest extent practicable.	Benedict advised that weeding control activities are planned around weather conditions & done when weather is favourable. Involves spraying, slashing, use of manual tools & hand pulling weeds. Auditor inspected site & observed weeding controls were being applied as per BRMP (Section 5.5). MSS provided copy of weeding log (Ref [30])	Future Annual Reports to provide copy of weeding log summarised the weeding activities undertaken during the reporting period	Low
A29	The Applicant may prepare and submit the Soil and Water Management Plan and/or Biodiversity and Rehabilitation Management Plan required under conditions B36 and B73 of Schedule 2 on a staged basis, prior to the commencement of Quarrying Operations in each of Phases 1 to 7. Quarrying Operations must not commence in any phase until a management plan has been approved by the Planning Secretary for that phase.	The SWMP was first prepared on 24/03/21. Version 3 dated February 2022 was approved by DPHI on 25/03/22. The current version 5 dated 9/09/24 was approved by DPHI on 20/09/24. The BRMP was first prepared on 6/05/21. Version 3 dated 17/01/22 was approved by DPHI on 3/03/22. The current version 5 dated 15/09/24 was approved by DPHI on 20/09/24. Commencement dates for Stages 1 - 8 given in feedback to Condition A5(b)	The SWMP should be updated to confirm the point of water supply for the project (refer technical specialist report, Appn D)	Low
A32	Unless the Applicant and the applicable authority agree otherwise, the Applicant must: (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by carrying out the development; and (b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the development. [Note: This condition does not apply to any damage to roads caused as a result of general road usage or otherwise addressed by contributions required by condition 26 of Schedule 1.]	The only public infrastructure at Menangle Quarry is the motorway, which has not been damaged as observed by the Auditor (refer photos in Appendix F)	Benedict to provide data addressing Condition A32 in future Annual Review reports.	Low
A33	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.	A copy of MSS plant & mainteance planner provided (Ref [29]). Benedict advised that all machines were serviced every 500 hours by suppliers who hold maintenance records. Auditor observed all site equipment was operational - refer photos in Appendix F	Benedict to provide a copy of the plant & equipment maintenance planner addressing Condition A33 in future Annual Review reports. MSS to continue proper maintenance of all plant & equipment	Low

Table 4-10 (cont'd) Summary of Auditor Recommendations for Future Environmental Compliance Work for Stage 8 of the Consent (page 2 of 7)

No.	Condition	Observation	Recommendation	Risk Level
B13A(b)	(b) erosion and sediment loss through the appropriate design and installation of drainage having regard to the Erosion and sediment control on unsealed roads A field guide for erosion and sediment control maintenance practices (OEH 2012) or latest version.	Auditor observed erosion and sediment control measures (refer photos in Appendix F). Flood events cause deposition of silt/sand across flooded areas. Some evidence of soil erosion along escarpment slope that needed to be repaired.	Benedict to provide data addressing Condition B13A in future Annual Review reports and document repair work caused by flood events	Low
B19	The Applicant must monitor groundwater levels at Groundwater Bores BH01_S, BH01_D, BH02, BH03 and BH04 as shown in Figure 1 in Appendix 5, using continuous data loggers, for the duration of Quarrying Operations in the Stage 8 Area.	The two EMM (27/02/23; 2/05/24) report showed that groundwater levels are continuously being monitored but some equiment failures in some data loggers have occurred. MSS also provided spreadsheet summarising groundwater level data (Ref [31]).	Groundwater level data continues to be downloaded each quarter and faulty equipment replaced. If equipment failures persist, download data monthly and/or install better equipment with a longer design life.	Low
B20	The Applicant must ensure that Quarrying Operations do not compromise the integrity of the monitoring bores identified in condition B19 of Schedule 2.	All 5 wells were sampled on 20/01/23 and 10/04/24. Auditor inspected all wells (refer photos in Appendix F)	Auditor considers the acidic levels measured by past GMEs in alluvium may not be represent-ative of field conditions. For future GMEs, wells are to be developed & purged prior to each sampling event. Care needs to be taken in filtering samples in field to minimise impacts from suspended sediment. Consultant to assess groundwater quality data. Benedict to notify DPHI, NSW EPA-Water Group and relevant stakeholders if acidic levels continue to be measured in alluvium outside trigger level	Low
B21	The Applicant must: (a) collect groundwater quality samples at each of the monitoring locations identified in condition B19; and (b) analyse collected groundwater quality samples for all major anions and cations and field parameters; on an annual basis for the duration of Quarrying Operations in the Stage 8 Area.	Condition met - refer results for GMEs conducted on 20/01/23 and 10/04/24 documented in EMM (27/02/24; 2/05/24) reports.		
B22(a)	The Applicant must ensure that: (a) temporary bores are drilled or augered progressively in each Substage to determine the local water table position immediately prior to commencing extraction in each Substage; and	Benedict advised that water level data obtained from wells & survey control data are used to determine excavation depth	Consultant to asess need for temporary bores in future groundwater monitoring reports	Low
B22(b)	(b) the pit floor in each Substage remains at least 1 metre above the measured water table level averaged over a seven-day period following the date of drilling or augering.	SWMP (Section 6.4.1) advised that soils will be extracted by excavator so extraction area base remains >1 m above measured water table level averaged over a 7 day period following date of installation.	Benedict to provide data in future annual reports addressing this condition for Stage 8 areas where quarrying has occurred	Low

Table 4-10 (cont'd) Summary of Auditor Recommendations for Future Environmental Compliance Work for Stage 8 of the Consent (page 3 of 7)

No.	Condition	Observation	Recommendation	Risk Level
B23	The Applicant must ensure that it has sufficient water for all stages of the development, and if necessary, adjust the scale of the development to match its available water supply.	Water obtained from River as a controlled activity under NRAR licence CAA-2021-11223. Benedict advised that a log is kep for how much water is extracted each day. The water extraction meter is still broken and its logged with Water NSW to be repaired (Ref [31]).	Water extraction data to be included in future Annual Reports. WaterNSW to repair water extraction meter.	Low
B25(c)	(c) incorporate the outputs of the groundwater model into the Site Water Balance as required under condition B36(c)(i) of Schedule 2.	Documented in SWMP (Section 6.2 & Appns D & E). SWMP (Section 6.2) advises that the site water balance will be updated annually.	Site water balance to be updated annually and included in future Annual Reports	Low
B29	Should the maximum annual water take as calculated by the groundwater model increase due to subsequent revisions of the groundwater model, as required under conditions B25 and B26 of Schedule 2, the Applicant must acquire the necessary additional licence shares to account for the maximum predicted annual volume.	SWMP (Section 1.9.2) advised that a Controlled Activity Approval (CAA) was granted by NRAR on 14/02/22 (CAA-2021-11223) for Substages 8A-8C sand extraction. MSS provides copy of water use log book to Water NSW, with a copy provided in Appendix I of the 2023 annual review report.	Benedict to determine need to acquire additional licence shares.	Low
B30	The Applicant must report on any water captured, intercepted or extracted from the site each year (directly and indirectly) in the Annual Review, including water taken under each Water Access Licence as applicable.	SWMP (Section 6.2) requires annual review of the water balance based on the collection of 12 months of data, which could be done from September 2024. Benedict advised that recording started in March 2024 and the data will be provided in the next annual report	Benedict to provide data in next annual report. Benedict to also address review comments provided by DPHI in 2/08/24 letter on Benedict 2023 Annual Review report.	Low
B38	The Applicant must implement the Soil and Water Management Plan approved by the Planning Secretary.	Available data indicates general compliance with approved SWMP. Benedict advised during the on-site meeting on 24 October 2024 that operations at the Menangle Quarry do involve importing compost & cow manure with about 500 m3 present at any one time. The compost and cow manure is placed in a single area located about 300m from the edge of the Nepean River and does not remain stockpiled for long as it is continuously being used and replenished.	Maintain compliant operations. The Auditor considered that the use of compost and cow manure at the quarry was likely to pose a low risk to water quality in the Nepean River, but considered that some additional protocols could be implemented to further reduce the risk of impact. These additional protocols are provided in Section 4.7.1 of the Audit Report.	Low

Table 4-10 (cont'd) Summary of Auditor Recommendations for Future Environmental Compliance Work for Stage 8 of the Consent (page 4 of 7)

No.	Condition	Observation	Recommendation	Risk Level
B40(c)	(c) provide details of the methods and timing of extraction within Substages 8E, 8F or 8G that demonstrate the integrity of the ephemeral creek (shown conceptually in Figure 5 of Appendix 1) would be maintained for as long as practicable during operations;	ECMP advised that these works will be undertaken prior to sand extraction in Substages 8E, 8F & 8G. Operations in these substages not commenced during audit period	Benedict to advise on status of these works & document them in next Annual report	Low
B40(d)	(d) provide for construction and stabilisation of appropriate diversion channels to divert surface water flows around the disturbance area, unless otherwise approved by the Planning Secretary;	ECMP advised that surface runoff from disturbed / unrehabilitated extraction area will be diverted to a sediment pond and be prevented from flowing into the realigned creek or Nepean River		
B49(a)	Within 12 months of commencing Quarrying Operations in the Stage 8 Area, and every five years thereafter until the conclusion of Quarrying Operations, the Applicant must undertake a Road Safety and Condition Audit for the development, to the satisfaction of the Planning Secretary. This Audit must: (a) be undertaken by a suitably qualified independent expert/s whose appointment has been endorsed by the Planning Secretary;	The Benedict 2023 Annual Review advised that Stage 8 quarrying operations commenced on 4/09/23. A Road Safety and Condition Audit needed to be completed by 4/09/24, which is outside the audit period (9/08/23 - 8/08/24). The Road Safety & Condition Audit was conducted on 28/02/25 (Ref [29]). An annual report on structural condition of road for TfNSW will be done at the same time if possible.	Benedict include a copy of the Road Safety & Condition Audit and road structural condition assessment in the next Annual Report. Maintain internal roads in good condition.	Low
B49(b)	(b) be prepared in consultation with Council;	Refer feedback to Condition B49(a)	Benedict to undertake Road Safety and Condition Audit and road structural condition assessment no later than 27/11/24 and document the results in the next Annual Report	Low
B49(c)	(c) assessment the safety, performance and condition of the site's vehicular access onto Menangle Road, including the associated acceleration and deceleration lanes;			
B49(d)	(d) identify any road works that are required to ensure compliance with relevant Austroads standards or relevant Council requirements;			
B49(e)	(e) be documented in a Road Safety and Condition Audit Report which must be submitted to Council and the Planning Secretary for approval within three months of commencing the Audit.			
B50	Within 12 months of completing each Road Safety and Condition Audit required under condition B49 of this Schedule, unless otherwise agreed by the Planning Secretary, the Applicant must complete any road works recommended in the Audit, to the satisfaction of Council. If there is a dispute regarding the implementation of any recommendations contained in the Audit, the Applicant may refer the	Refer feedback to Condition B49(a)	Benedict to undertake Road Safety and Condition Audit and road structural condition assessment no later than 27/11/24 and document the results in the next Annual Report	Low

Table 4-10 (cont'd) Summary of Auditor Recommendations for Future Environmental Compliance Work for Stage 8 of the Consent (page 5 of 7)

No.	Condition	Observation	Recommendation	Risk Level
B55(g)	(g) describe the measures to be put in place to ensure compliance with the Drivers' Code of Conduct;	The TMP (Section 1.8) requires a Road Safety and Condition Audit to be undertaken within 12 months of commencing quarrying operations in Stage 8 Area.	Benedict to undertake Road Safety & Condition Audit & road structural condition assessment by 27/11/24 [also refer Condition B49(a)] and document results in next Annual Report	Low
B71	The Applicant must rehabilitate the Substages progressively, to the satisfaction of the Planning Secretary.	Work in progress with rehabilitation work not yet completed in any part of Stage 8. Ian to inspect site and verify	Benedict to document compliance with this condition in Annual Reports. The report needs to among other things document: • compliance with recommendation provided in the previous year SRRAPR; • update the restoration area 1 management strategy (Attachment D, Annual Report); • compliance with recommendations given in the ecological monitoring report (Attachment E, Annual Report); • nest box installation & monitoring records; • compliance with planting guidelines and plant species (Attachment F, Annual Report); and • recommendations in BRMP monitoring report (Attachment, Annual Report).	Low
B72(a)	Unless otherwise agreed by the Planning Secretary, the Applicant must ensure that: (a) no more than two Substages are opened, excavated or worked at any one time without the written approval of the Planning Secretary;			
B72(b)	(b) the active extraction area in all combined Substages does not exceed 0.33 hectares at any one time;			
B72(c)	(c) the area of exposed ground at any one time is minimised as far as reasonable and feasible, for the life of the development;			
B72(d)	(d) Quarrying Operations do not progress from one phase of the development to another unless the progressive rehabilitation performance criteria in the Biodiversity and Rehabilitation Management Plan have been met (with the exception of in the active extraction area) for the previous phase (see condition B73(d) of Schedule 2); and			
B72(e)	(e) the post-extraction batter along the landward edge of each Substage does not exceed a maximum slope of 1:1 (V:H) or the natural underlying sandstone profile.			
B73(k)	(k) include an annual program to monitor and report on: (i) the effectiveness of the measures required under (j) above; (ii) progress against the detailed performance and completion criteria required under (d) and (d) above; (iii) any progressive improvements that could be implemented to improve biodiversity outcomes; and (iv) any additional or remedial actions required over the next 12 months;	Refer BRMP (Section 8.4). The Benedict 2023 Annual Review included a SRRAPR for the 2023 calendar year. The SRRAPR provided monitoring results for: Landform establishment, stability and growth medium; Biodiversity management measures; Weed monitoring; Nest box and woody debris.The SRRAPR summarised: The measures taken in the preceding 12 months; Monitoring results; Progress against the detailed performance and completion criteria; Report on the effectiveness of the measures; Trends to be identified when second report prepared; and, Described measures to be taken in next 12 months.	Ongoing monitoring to be documented in annual SRRAPRs prepared in accordance with the BRMP. Address review comments provided by DPHI in 2/08/24 letter on Benedict 2023 Annual Review report.	Low

Table 4-10 (cont'd) Summary of Auditor Recommendations for Future Environmental Compliance Work for Stage 8 of the Consent (page 6 of 7)

No.	Condition	Observation	Recommendation	Risk Level
B76	The Applicant must place or create a minimum of 106 nest boxes or tree hollows within the Restoration Area within 12 months of commencing Quarrying Operations in the Stage 8 Area.	The Benedict 2023 SRRAPR (Section 5 & Attachment G) shows that between April and December 2023, 35 nest boxes were installed in stages 8A-8C.	Benedict need to install the remaining 71 next boxes by 4/09/24.	Low
B80	The Applicant must rehabilitate 1.22 ha within Stage 6 and 3.44 ha within Stage 7 of the development in accordance with the objectives and the performance and completion criteria in Table 6 in Appendix 6.	Benedict advises that this is ongoing but has been inhibited by flooding. Auditor observed this was the case (refer photos Appendix F)	Rehabilitation requirements for Stages 6 and 7 ongoing and need to be completed in accordance with the Consent requirements. Documentation to be included in next Annual Report	Low
B89	The Applicant must manage noxious weeds on the site in accordance with the Biodiversity and Rehabilitation Management Plan, and subject to the restrictions in condition A18 of this Schedule, to the satisfaction of the Planning Secretary.	The Benedict (August 2024) SRRAPR (Section 4) provided a weed monitoring report. The report advised that progress on weed performance & completion criteria met for lantana & privet control in Stage 6 but not in stages 7 & 8. Measures to be taken in 2024 include ongoing weed management in Restoration Area 1. Completing substage 8A and soon to be completed Substage 8B will be a priority.	Weed management in 2024 needs to address shortcomings in 2023 and ensure the performance and completion criteria are met in 2024.	Low
B91(a)	The Applicant must: (a) manage on-site sewage treatment and disposal in accordance with the requirements of an applicable EPL, and to the satisfaction of EPA and Council;	No complaints recorded in Benedict 2023 Annual Review. No complaints received from local Councils, EPA & TfNSW (refer Section 4.7). The Benedict 2023 Annual Review (Section 5) advised the Stage 8 development generates little waste by-products. Clearing of land generates useful rehabilitation vegetation which is stored and reused. Weed residues (e.g. Lantana) is buried in the extraction holes. Other debris that might occasionally arrive onsite via elevated river levels would be taken to the site rubbish bin and removed by the regular contractor service. Materials received on-site reported to comprise compost / foul manure, excavation sand & some recovered fines from Lake Chipping Norton Facility. All imported materials are weighed on the weighbridge & data included in the EPA Waste & Resource Recovery Portal (WARRP).	Future Benedict Annual Reports need to provide a log of all materials imported to the Menange Quarry so that the suitability of imported materials can be reviewed and audited	Low
B91(b)	(b) minimise the waste generated by the development;			
B91(c)	(c) ensure that the waste generated by the development is appropriately stored, handled, and disposed of; and			
B91(d)	(d) report on waste minimisation and management in the Annual Review.			
B92	Except as expressly permitted in an applicable EPL, specific resource recovery order or exemption under the Protection of the Environment Operations (Waste) Regulation 2014, the Applicant must not receive waste at the site for storage, treatment, processing, reprocessing or disposal.			

Table 4-10 (cont'd) Summary of Auditor Recommendations for Future Environmental Compliance Work for Stage 8 of the Consent (page 7 of 7)

No.	Condition	Observation	Recommendation	Risk Level
D9(a)	By the end of March in each year after the commencement of Quarrying Operations in the Stage 8 Area, or other timeframe agreed by the Planning Secretary, a report must be submitted to the Department reviewing the environmental performance of the development, to the satisfaction of the Planning Secretary. This review must: (a) describe the development (including any rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year;	First annual review report submitted by Benedict 22/04/24 and approved by DPHI in 2/08/24 letter. In their letter, DPHI recommended a copy of annual review be uploaded to Benedict website. Audit confirmed compliance with this instruction. DPHI also made recommendation for future Annual Review reports.	Future annual reports need to address recommendation made by DPHI in their 2/08/24 letter.	Low
D9(b)	(b) include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, including a comparison of these results against the: (i) relevant statutory requirements, limits or performance measures/criteria; (ii) requirements of any plan or program required under this consent; (iii) monitoring results of previous years; and (iv) relevant predictions in the documents listed condition A7(c).	Monitoring data provided by 2023 annual report covered noise compliance, on-site air quality, ambient air quality, groundwater, site complaints. Annual report reviewed and assessed monitoring data and complaints records. General compliance achieved. DPHI approved report.	Ongoing monitoring to comply with consent requirements. Future annual reports need to address recommendation made by DPHI in their 2/08/24 letter.	Low
D9(e)	(e) identify any trends in the monitoring data over the life of the devel	The 2023 annual report was the first prepared for Stage 8, so no trends could be identified at that time.	Future annual reports to identify trends in monitoring data.	Low
D9(f)	(f) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and	The 2023 annual report (Section 7) advised that it was too early in the Stage 8 work to identify any discrepancies between the predicted and actual impacts of the development and analyse the potential cause of any significant discrepancies.	Future annual reports need to identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies.	Low
D9(g)	(g) describe what measures will be implemented over the next calendar year to improve the environmental performance of the development.	The 2023 annual report (Section 8) advised that proposed measures included ongoing nest box roll out (33% installed currently), infill planting and weed management, staged rehabilitation, modified mulching strategy, modified woody debris placement.	Future annual reports to describe what measures will be implemented over the next calendar year to improve the environmental performance of the development.	Low

4.11 Non-compliances

Of the 205 statutory conditions needed to be met by the Stage 8 work at the Menangle Quarry, 27 of the conditions were not triggered. The remaining 178 conditions were triggered and compliance was achieved for practically all conditions. The one exception was condition B22, which requires temporary bores to be drilled or augered progressively in each Substage to determine the local water table position immediately prior to commencing extraction in each Substage.

To address this issue, temporary bores should be drilled in the next substage to assess whether this condition is necessary because the operational risk to groundwater is considered low. The Auditor considered this one non-compliance posed a low risk.

4.12 Environmental Performance

Refer **Section 5**.

4.13 Improvement Opportunities

The Auditor considers that while only one low risk non-compliance was identified by this IEA in meeting statutory requirements for the Stage 8 work during the Audit Period, several improvement opportunities were identified. Some of these recommendations address feedback provided by some stakeholders. These opportunities correspond to recommendations made by the Auditor for future work, which are summarised in **Table 4-10**. The Auditor recommends that compliance with these recommendations be addressed and documented in future Annual Review Reports.

The 2023 Annual Review Report[34] identified that mowing grass in the administrative area of the quarry is important to keep the site tidy and bushfire ready. However, such work can impact dust levels monitored at location DDG1. The Auditor considers that both needs would benefit from grass mowing in drier months being conducted on still days when wind levels are minimal and there is a lower potential for dust generation. Consideration could also be given to the type of mowing equipment used when there is a need to replace existing plant.

The 2023 Annual Review Report[35] also provided a summary of proposed environmental improvements, these being:

- Ongoing nest box roll out – 33% installed currently;
- Infill planting and weed management;
- Staged rehabilitation;
- Modified mulching strategy; and
- Modified woody debris placement.

The Auditor recommends that the implementation of these proposed measures be documented in the next Annual Review Report. The Auditor also considers that opportunities are likely to exist for Menangle Quarry to achieve efficiencies and improved outcomes as experience in conducting Stage

[34] Section 6, Ref [15]
[35] Section 8, Ref [15]

8 work is gained. Improvement areas realised by Menangle Quarry should be documented in the Annual Report Reviews.

5. Conclusions & Recommendations

The Auditor considers the weight of evidence supports the conclusion that Stage 8 operations at Menangle Quarry have been well managed over the Audit Period and an acceptable level of environmental performance achieved. This is because:

- No significant non-compliances were identified during the Audit Period for the Stage 8 work. The one non-compliance concerned Condition B22, which requires temporary bores to be drilled or augered progressively in each Substage to determine the local water table position immediately prior to commencing extraction in each Substage. To address this issue, temporary bores should be drilled in the next substage to assess whether this condition is necessary because the operational risk to groundwater is considered low (**Section 4.10.2**);
- The Auditor is not aware of any agency notices, order, penalty notices or prosecutions against the Facility during the Audit Period (**Section 4.4**);
- Stakeholder requirements as notified to the Auditor have been met (**Section 4.7**) or are included as recommendations for future work (**Table 4-10**);
- Reasonable measures have been taken by Menangle Quarry to minimise complaints regarding the Stage 8 operation (**Section 4.8**). The Auditor is not aware of any other complaints having been made by off-site receptors during the Audit Period. The Auditor considers the relatively small number of complaints made during the Audit Period supports the conclusion that operations at the site have been well managed; and
- There were no incidents associated with the quarry operation during the Audit Period (**Section 4.9**).

The Auditor recommends that the improvement opportunities described in **Section 4.13** be implemented and documented in the next Annual Review Report.

6. Other Relevant Information

This IEA report relates to the environmental performance of the Stage 8 work at Menangle Quarry located at 31 Menangle Road, Menangle NSW 2568. The IEA has been prepared in accordance with DPHI and NSW EPA audit requirements. Opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal opinions.

The audit report has been prepared for Benedict Recycling (the 'Client'), the DPHI and NSW EPA for the purposes nominated in the report. The scope of work performed in connection with the audit may not be appropriate to satisfy the needs of any other person. Any other person's use of, or reliance on, the audit report and statement, or the findings, conclusions, recommendations or any other material presented in them, is at that person's sole risk.

The audit was, and this report is, limited by and relies on the scope of work undertaken for this audit, the information made available to the Auditor by the Client and their environmental consultants through the documents provided to us, and also on our observations of the site made during the Audit Period. The Auditor has taken this information to represent a fair and reasonable characterisation of operations at the site. Whilst all reasonable care has been taken, to the extent practical under normal auditing procedures, to assure adequacy of the information, the Auditor and Ian Swane & Associates cannot warrant that this is the case. If the information is subsequently determined to be false, inaccurate or incomplete, it is possible that the Auditor's conclusions, as expressed in the audit report may change.

It is not possible in an Audit Report to present all data that could be of interest to all readers of this report. Readers are therefore referred to the referenced documentation for further data.

Yours faithfully

Dr Ian C Swane (CPEng)
Accredited EPA Site Auditor in NSW and NT
Ian Swane & Associates Pty Ltd

Appendix A. Planning Secretary Audit Approvals

Department of Planning, Housing and Infrastructure

NSW Planning ref: DA85/2865-PA-49
Mr Ewen McKenzie
Acting Environmental Compliance Manager
BENEDICT RECYCLING PTY LIMITED
11 NARABANG WAY
BELROSE New South Wales 2085
06/08/2024

Sent via the Major Projects Portal only

Subject: Menangle Quarry – Independent Environmental Audit - audit team endorsement 2024

Dear Mr McKenzie

Reference is made to your post approval matter, DA85/2865-PA-49, request for the Planning Secretary's approval of suitably qualified, experienced, and independent person to conduct an Independent Enivronmental Audit (IEA) of the Menangle Quarry submitted as required by Part D Condition D 11 of DA85/2865 as modified (the approval) to NSW Department of Planning, Housing and Infrastructure (NSW Planning) on 2 August 2024.

NSW Planning has reviewed the independent auditor nomination and based on the information you have provided is satisfied that the proposed person is suitably qualified, experienced, and independent. Consequently, as nominee of the Planning Secretary, I approve the appointment of Dr Ian C Swaine of Ian Swaine and Associates to undertake the IEA and prepare the IEA report.

This approval is conditional on the audit team being independent of the development and maintaining a current Exemplar Global accreditation

Notwithstanding the above appointment, NSW Planning requests that additional audit team experts in the fields of Ecology and Surface and Groundwater are required. These expert nominations must be submitted to NSW Planning for the Secretary's consideration prior to commencing the IEA.

Please ensure this correspondence is appended to the Independent Audit Report.

The audit must be conducted in accordance with the condition of approval and AS/NZS ISO 19011 Australian/New Zealand Standard: Guidelines for quality and/or environmental management systems auditing. The Audit team may also wish to consider the and the Independent Audit Post Approval Requirements (Department 2020 or as updated). A copy of this guideline can be located at http://planning.nsw.gov.au/Policy-and-Legislation/Mining-and-Resources/Integrated-Mining-Policy

The audit must include:

- consultation with the relevant agencies;
- assess the environmental performance of the development and whether it is complying with the relevant requirements in this consent, water licences and mining leases for the development (including any assessment, strategy, plan or program required under these approvals);
- review the adequacy of any approved strategy, plan or program required under the abovementioned approvals and this consent and
- recommend appropriate measures or actions to improve the environmental performance of the development and any assessment, strategy, plan or program required under the abovementioned approvals and this consent.

Failure to meet these requirements will require revision and resubmission.

Within three months of commencing an Independent Environmental Audit, or within another timeframe agreed by the Planning Secretary, the Applicant must submit a copy of the audit report to the Planning Secretary, and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of the recommendations.

NSW Planning reserves the right to request an alternate auditor or audit team for future audits.

Should you wish to discuss the matter further, please contact me on 0429400261 or email compliance@planning.nsw.gov.au

Yours sincerely

Katrina O'Reilly
Team Leader - Compliance
Compliance
As nominee of the Planning Secretary

Department of Planning, Housing and Infrastructure

NSW Planning ref: DA85/2865-PA-50
Mrs Alycia O'Brien
Environmental Compliance Manager
BENEDICT RECYCLING PTY LIMITED
11 NARABANG WAY
BELROSE New South Wales 2085
20/08/2024

Sent via the Major Projects Portal only

Subject: Menangle Quarry – Independent Environmental Audit - experts endorsement

Dear Mrs O'Brien

Reference is made to your post approval matter, DA85/2865-PA-50, request for the Planning Secretary's approval of suitably qualified, experienced, and independent persons for the Independent Environmental Audit (IEA) of Menangle Quarry, submitted as required by Part D Condition D 11 of DA85/2865 as modified (the approval) to NSW Department of Planning, Housing and Infrastructure (NSW Planning) on 15 August 2024.

NSW Planning has reviewed the independent expert auditor nominations and based on the information you have provided is satisfied that the proposed persons are suitably qualified, experienced, and independent.

Consequently, as nominee of the Planning Secretary, I approve the appointment of the below experts from EMM Consulting Pty Limited to be part of the IEA team;

- Jonathan Tait, Associate Hydrogeologist
- Lachlan Hammersley, Associate Water Resources Engineer
- Philippa (Pip) Fagan, Associate Ecologist.

Please ensure this correspondence is appended to the Independent Audit Report.

Should you wish to discuss the matter further, please contact me on 0429400261 or email compliance@planning.nsw.gov.au

Yours sincerely

Katrina O'Reilly
Team Leader - Compliance
Compliance
As nominee of the Planning Secretary

Department of Planning and Environment

Ms Alycia O'Brien
Environmental Compliance Manager
Benedict Recycling Pty Limited
11 Narabang Way
BELROSE, NSW 2085

24/01/2025

Subject: Extension Request for Independent Environmental Audit 2024

Dear Ms O'Brien

I refer to your request of 22 January 2025 seeking extension of time for the submission of the Independent Environmental Audit Report and the response to recommendations contained in the audit report for Menangle Quarry ("the development"), in accordance with Schedule 2, Condition D12 of the development consent DA 85/2865, as modified ("the consent").

Having considered your request, the Planning Secretary grants an extension of time for the submission of the audit report and the response to recommendations contained in the audit report by 14 March 2025.

Should you have any enquiries in relation to this matter, please contact Georgia Dragicevic, Senior Compliance Officer, on 4247 1852 or by email to Georgia.Dragicevic@planning.nsw.gov.au.

Yours sincerely

Katrina O'Reilly
Team Leader - Compliance
Compliance
As nominee of the Secretary

Appendix B. Independent Audit Declaration Form (1/05/20)

Project Name:	Menangle Quarry
Consent Number:	DA85/2865 as modified by Modification 2 (Mod 2 Consent)
Description of Project:	Sand and soil extraction quarry
Project Address:	31 Menangle Road, Menangle NSW 2568
Proponent:	Benedict Recycling Pty Limited
Date:	13 March 2025

I declare that:

i. I am not related to any proponent, owner, operator or other entity involved in the delivery of the project. Such a relationship includes that of employer/employee, a business partnership, sharing a common employer, a contractual arrangement outside an Independent Audit, or that of a spouse, partner, sibling, parent, or child;

ii. I do not have any pecuniary interest in the project, proponent or related entities. Such an interest includes where there is a reasonable likelihood or expectation of financial gain (other than being reimbursed for performing the audit) or loss to the auditor, or their spouse, partner, sibling, parent, or child;

iii. I have not provided services (not including independent reviews or auditing) to the project with the result that the audit work performed by themselves or their company, except as otherwise declared to the Department prior to the audit;

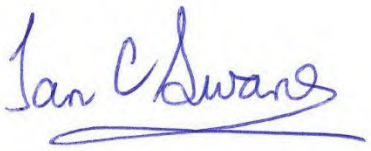
iv. I am not an Environmental Representative for the project; and

v. I will not accept any inducement, commission, gift or any other benefit from auditee organisations, their employees or any interested party, or knowingly allow colleagues to do so.

Notes:

a) Under section 10.6 of the *Environmental Planning and Assessment Act 1979* a person must not include false or misleading information (or provide information for inclusion in) in a report of monitoring data or an audit report produced to the Minister in connection with an audit if the person knows that the information is false or misleading in a material respect. The proponent of an approved project must not fail to include information in (or provide information for inclusion in) a report of monitoring data or an audit report produced to the Minister in connection with an audit if the person knows that the information is materially relevant to the monitoring or audit. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000; and

b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 307B (giving false or misleading information – maximum penalty 2 years imprisonment or 200 penalty units, or both).



Name of Auditor: Dr Ian C Swane Signature:

Qualification: NSW EPA site auditor, BE (Hons), PhD, CPEng, CSCS

Company: Ian Swane & Associates Company Address: PO Box 359, Mortdale NSW 2223

Appendix C. Stakeholder Consultation Documentation

iswane@bigpond.com

From:	Greg Woods <Greg.Woods@campbelltown.nsw.gov.au>
Sent:	Tuesday, 22 October 2024 1:31 PM
To:	iswane@bigpond.com
Cc:	Leon Marskell; Liam Saville
Subject:	RE: Independent Environmental Audit for Benedict Menangle Sand Quarry (EPL 3991)
Attachments:	ZCCC_313076_240930_COA.pdf; Menangle_Bridge_Historical_Data.xlsx; Menangle_Bridge_WQResults_2022-2024.xlsx

Hi Ian,

As requested, please find attached historical water quality records for Menangle Bridge gathered under previous monitoring program (2006-2020) and water quality results for Menangle Bridge under current monitoring program (2022-present).

We conduct monthly monitoring of 13 sample sites, including Menangle Beach (-34.118596°, 150.740478° - green circle in the map below) and covers physiochemical and some microbial parameters. Weekly sampling between November and April tests for algal community composition and has recently included Enterococci testing. As part of our investigations for natural swim site activations, we also conduct ad-hoc sampling following heavy rainfall (>10mm at 3 local weather stations) for microbial source tracking.

Please also find attached an example of the Sydney Water Lab Services report that accompanies data sets after testing. Please reach out if you would like any more information.

Greg Woods
Team Leader Development & Environmental Compliance
City Standards & Health
Ph 02 4645 4086
greg.woods@campbelltown.nsw.gov.au

From: iswane@bigpond.com <iswane@bigpond.com>
Sent: Tuesday, 15 October 2024 4:13 PM
To: Greg Woods <Greg.Woods@campbelltown.nsw.gov.au>
Cc: Leon Marskell <Leon.Marskell@campbelltown.nsw.gov.au>
Subject: RE: Independent Environmental Audit for Benedict Menangle Sand Quarry (EPL 3991)

Greg

Many thanks for your feedback. Please send me a copy of the surface water quality data / reports you refer to in your 9 October 2024 email. A figure showing sample locations and reports that document the sampling procedures and QA/QC would be good to accompany Council's water quality data.

Kind regards
Ian

Dr Ian C Swane (CPEng, CEnvP)
EPA Site Auditor
Ian Swane & Associates (mob: 0418 867 112)

From: Greg Woods <Greg.Woods@campbelltown.nsw.gov.au>
Sent: Wednesday, October 9, 2024 1:26 PM
To: iswane@bigpond.com
Cc: Leon Marskell <Leon.Marskell@campbelltown.nsw.gov.au>
Subject: RE: Independent Environmental Audit for Benedict Menangle Sand Quarry (EPL 3991)

Hi Ian,
As discussed, the property in question is not in Campbelltown City Council's LGA.
However, we're not aware of any direct incidents involving Benedict Sand Mine, but the impact of activities on sites further downstream of the location are of tremendous importance to us, especially for Nepean River Reserve located directly opposite the mine and scheduled for natural swim site activation with Council endorsement later this year.

The level of microbial and faecal contamination is of immediate concern for the safety and suitability of the Reserve as a swim site, and both dry and wet weather readings over the past year have infrequently exceeded the trigger value for safe primary water contact. We'd be happy to provide you with our data to either exclude or confirm the influence of the Sand mine on microbial content of Council's recreational waters.

Council has been conducting water quality monitoring at Nepean River Reserve since 2006, and results for turbidity, electrical conductivity and total suspended solids downstream of operations

and pump outs from the mine could be useful for you in your investigation, and we'd be more than happy to provide those.

Also, although we have not had any complaints or issues from the neighbouring sites, Menangle Park is a newly developed residential area, and with upcoming housing projects in close proximity to the quarry, potential issues may arise in the future.

Please let me know if you'd like any more information.

Greg Woods
Acting Coordinator City Standards & Health

Ph 02 4645 4086
greg.woods@campbelltown.nsw.gov.au

CAMPBELLTOWN CITY COUNCIL

From: iswane@bigpond.com <iswane@bigpond.com>
Sent: Friday, October 4, 2024 8:29 AM
To: Council <Council@campbelltown.nsw.gov.au>
Subject: Independent Environmental Audit for Benedict Menangle Sand Quarry (EPL 3991)

Attention: The Appropriate Council Officer

Dear Campbelltown City Council,

I have been approved by the Department of Planning, Housing and Infrastructure (**DPHI**) to undertake an independent environmental audit (**IEA**) for the Benedict Menangle Sand Quarry located at 31 Menangle Road, Menangle NSW 2568 (the **Facility**). The audit is being undertaken to comply with Conditions D11 and D12 of a Consolidated Consent numbered 85/2865 issued by the DPHI in November 2021 (the **Consent**). The audit covers the first year of quarrying by Benedict in the Stage 8 area and covers the period 9 August 2023 to 8 August 2024.

The requirements of the Consent considered relevant to this IEA cover:

- Administrative conditions (Consent Part A);
- Specific environmental conditions (Consent Part B);
- Additional procedures (Consent Part C); and
- Environmental management, reporting and auditing (Consent Part D).

The requirements of Environment Protection Licence (**EPL**) number 3991 considered relevant to this IEA cover:

- Administrative conditions (EPL Part 1);
- Limit conditions (EPL Part 2);
- Operating conditions (EPL Part 3);
- Monitoring and recording conditions (EPL Part 4); and
- Reporting conditions (EPL Part 5).

The **Campbelltown City Council** is invited to provide me with comments / requirements or specific environmental issues the **Campbelltown City Council** requires the audit to target. Feedback would most conveniently be via email. In the interim, please don't hesitate to contact me by email or mobile should you require any further information regarding the audit.

Many thanks
Ian

Dr Ian C Swane (CPEng, CEnvP)
EPA Site Auditor
Ian Swane & Associates (mob: 0418 867 112)

Corporate Accreditation No 63

Accredited for compliance with ISO/IEC 17025 - Testing

Sydney WATER
Laboratory Services

Delivery Address: Sydney Water Corporation
51 Hermitage Rd
West Ryde NSW 2114

Telephone: (02) 9800 6935
Email: analyticalservices@sydneywater.com.au

Analytical Report 313076

Issue Date: 05/10/2024
Issued By : Sydney Water Laboratory Services

Attention: Will Shaw
Customer: Campbelltown City Council
Customer ID: ZCCC

Address: Corner of Queen and Broughton Streets, Campbelltown
Telephone:
Email: will.shaw@campbelltown.nsw.gov.au

CONTENTS

Sydney Water Approved Signatory

Alka Kumari, Microbiology Analyst
Jouliet Ashak, Microbiology Analyst
Gabrielle Joukhdar, Microbiology Senior Analyst

Tests authorised by Non Signatories

GL03

Where a result is required to meet a compliance limit or specification the associated uncertainty must be considered. Uncertainty estimates are available for all accredited test results.

Sydney WATER Laboratory Services

SAMPLE SUMMARY

Client Sample ID	Sample Number	Sampling Procedure	Date Sampled	Date Received	Date Authorised	Description
MENANGLE BRIDGE	L24082225	1	29/09/2024	30/09/2024	04/10/2024	(EW)
INGLEBURN WEIR	L24082226	1	29/09/2024	30/09/2024	02/10/2024	(EW)
SIMMOS BEACH	L24082227	1	29/09/2024	30/09/2024	02/10/2024	(EW)
CAMBRIDGE AVENUE	L24082228	1	29/09/2024	30/09/2024	02/10/2024	(EW)
MENANGLE BRIDGE	L24082229	1	30/09/2024	30/09/2024	02/10/2024	(EW)
INGLEBURN WEIR	L24082230	1	30/09/2024	30/09/2024	04/10/2024	(EW)
SIMMOS BEACH	L24082231	1	30/09/2024	30/09/2024	04/10/2024	(EW)
CAMBRIDGE AVENUE	L24082232	1	30/09/2024	30/09/2024	04/10/2024	(EW)
MENANGLE BRIDGE	L24082233	1	01/10/2024	01/10/2024	04/10/2024	(EW)
INGLEBURN WEIR	L24082234	1	01/10/2024	01/10/2024	04/10/2024	(EW)
SIMMOS BEACH	L24082235	1	01/10/2024	01/10/2024	03/10/2024	(EW)
CAMBRIDGE AVENUE	L24082236	1	01/10/2024	01/10/2024	04/10/2024	(EW)

Sampling procedures

1 Samples analysed as received.
2 Samples collected as per FS procedures SAWI 070, Excluding Oil & Grease which is collected as per clients instructions.
3 Samples collected as per FS procedures SAWI 070.
4 Results reported as received from WNSW.

Sydney WATER Laboratory Services

ANALYTICAL RESULTS

Sampling Point		ZCCC_MB				ZCCC_MB			
Client Sample ID		MENANGLE BRIDGE	INGLEBURN WEIR	SIMMOS BEACH	CAMBRIDGE AVENUE	MENANGLE BRIDGE	INGLEBURN WEIR	SIMMOS BEACH	CAMBRIDGE AVENUE
Sampled Date		29/09/2024 05:00:00 PM	29/09/2024 05:30:00 PM	29/09/2024 06:00:00 PM	29/09/2024 06:30:00 PM	30/09/2024 08:00:00 AM	30/09/2024 07:15:00 AM	30/09/2024 07:00:00 AM	30/09/2024 06:45:00 AM
Sample Number		L24082225	L24082226	L24082227	L24082228	L24082229	L24082230	L24082231	L24082232
EXTERNAL TESTING									
X_FIELD : Methods External									
Dry or Wet weather flow*	N/A	Targeted	Targeted	Targeted	Targeted	Targeted	Targeted	Targeted	Targeted
GENOMICS									
GL03 : Microbial source tracking to detect human or animal source of contamination									
Filtration and extraction (batch 3- 6)*	N/A	Done	-	-	-	-	Done	Done	Done
Bacteroides HF183 (batch 3-6)*	Gene Copies/L	Detected	-	-	-	-	Not Detected	Not Detected	1600
crAssphage CPQ_056 (batch 3-6)*	Gene Copies/L	Not Detected	-	-	-	-	Not Detected	Detected	70000
Sample Volume*	mL	1000	-	-	-	-	1000	1000	1000
Date of Performance	DD/MM/YY	02/10/24					02/10/24	02/10/24	02/10/24
MICRO									

* Indicates NATA accreditation does not cover the performance of this service

"-" = Not required or refer to Laboratory comment

Sydney WATER Laboratory Services

Sampling Point		ZCCC_MB				ZCCC_MB			
Client Sample ID		MENANGLE BRIDGE	INGLEBURN WEIR	SIMMOS BEACH	CAMBRIDGE AVENUE	MENANGLE BRIDGE	INGLEBURN WEIR	SIMMOS BEACH	CAMBRIDGE AVENUE
Sampled Date		29/09/2024 05:00:00 PM	29/09/2024 05:30:00 PM	29/09/2024 06:00:00 PM	29/09/2024 06:30:00 PM	30/09/2024 08:00:00 AM	30/09/2024 07:15:00 AM	30/09/2024 07:00:00 AM	30/09/2024 06:45:00 AM
Sample Number		L24082225	L24082226	L24082227	L24082228	L24082229	L24082230	L24082231	L24082232
MICRO									
MI01 : Faecal Coliform and/or E. coli									
E.coli	CFU/100mL	~140	34	~28	200	11	~50	~200	360
Faecal Coliform	CFU/100mL	~140	34	~28	200	11	~50	~200	360
Date of Performance	D/M/Y H:M	30/09/24 10:36	30/09/24 10:36	30/09/24 10:36	30/09/24 10:36	30/09/24 10:36	30/09/24 10:36	30/09/24 10:36	30/09/24 10:36
MI03AS : Enterococci by Membrane Filtration									
Enterococci	CFU/100mL	~1400	17	32	20	37	45	~1000	660
Date of Performance	D/M/Y H:M	30/09/24 10:36	30/09/24 10:36	30/09/24 10:36	30/09/24 10:36	30/09/24 10:36	30/09/24 10:36	30/09/24 10:36	30/09/24 10:36

Sampling Point		ZCCC_MB							
Client Sample ID		MENANGLE BRIDGE	INGLEBURN WEIR	SIMMOS BEACH	CAMBRIDGE AVENUE				
Sampled Date		01/10/2024 08:00:00 AM	01/10/2024 07:15:00 AM	01/10/2024 07:00:00 AM	01/10/2024 06:45:00 AM				
Sample Number		L24082233	L24082234	L24082235	L24082236				

* Indicates NATA accreditation does not cover the performance of this service

Sydney WATER Laboratory Services

Sampling Point		ZCCC_MB							
Client Sample ID		MENANGLE BRIDGE	INGLEBURN WEIR	SIMMOS BEACH	CAMBRIDGE AVENUE				
Sampled Date		01/10/2024 08:00:00 AM	01/10/2024 07:15:00 AM	01/10/2024 07:00:00 AM	01/10/2024 06:45:00 AM				
Sample Number		L24082233	L24082234	L24082235	L24082236				
EXTERNAL TESTING									
X_FIELD : Methods External									
Dry or Wet weather flow*	N/A	Targeted	Targeted	Targeted	Targeted				
GENOMICS									
GL03 : Microbial source tracking to detect human or animal source of contamination									
Filtration and extraction (batch 3- 6)*	N/A	Done	Done	-	Done				
Bacteroides HF183 (batch 3-6)*	Gene Copies/L	1100	Not Detected	-	12000				
crAssphage CPQ_056 (batch 3-6)*	Gene Copies/L	Not Detected	Not Detected	-	54000				
Sample Volume*	mL	1000	1000	-	1000				
Date of Performance	DD/MM/YY	02/10/24	02/10/24		02/10/24				
MICRO									
MI01 : Faecal Coliform and/or E. coli									

* Indicates NATA accreditation does not cover the performance of this service

"-" = Not required or refer to Laboratory comment

Sydney WATER Laboratory Services

Sampling Point		ZCCC_MB							
Client Sample ID		MENANGLE BRIDGE	INGLEBURN WEIR	SIMMOS BEACH	CAMBRIDGE AVENUE				
Sampled Date		01/10/2024 08:00:00 AM	01/10/2024 07:15:00 AM	01/10/2024 07:00:00 AM	01/10/2024 06:45:00 AM				
Sample Number		L24082233	L24082234	L24082235	L24082236				
MICRO									
MI01 : Faecal Coliform and/or E. coli(Continued)									
E.coli	CFU/100mL	19	30	~48	~590				
Faecal Coliform	CFU/100mL	19	30	~53	~710				
Date of Performance	D/M/Y H:M	01/10/24 09:04	01/10/24 09:04	01/10/24 09:04	01/10/24 09:04				
MI03AS : Enterococci by Membrane Filtration									
Enterococci	CFU/100mL	49	65	30	~920				
Date of Performance	D/M/Y H:M	01/10/24 09:04	01/10/24 09:04	01/10/24 09:04	01/10/24 09:04				

(~): Counts of target colonies are outside the optimal precision range.

COMMENTS

Sample ID	Comment Level	Method	Test	Comment
L24082225	**Method**	**GL03**	-	Bacteroides HF183 gene detected, but below the limit of quantification.
L24082231	**Method**	**GL03**	-	crAssphage CPQ_056 gene detected, but below the limit of quantification.
L24082225	**Method**	**MI01**	-	Result confirmed.
L24082226	**Method**	**MI01**	-	Result confirmed.
L24082227	**Method**	**MI01**	-	Result confirmed.

* Indicates NATA accreditation does not cover the performance of this service

Sydney WATER Laboratory Services

L24082228	**Method**	**MI01**	-	Result confirmed.
L24082229	**Method**	**MI01**	-	Result confirmed.
L24082230	**Method**	**MI01**	-	Result confirmed.
L24082231	**Method**	**MI01**	-	Result confirmed.
L24082232	**Method**	**MI01**	-	Result confirmed.
L24082233	**Method**	**MI01**	-	Result confirmed.
L24082234	**Method**	**MI01**	-	Result confirmed.
L24082235	**Method**	**MI01**	-	Result confirmed.
L24082236	**Method**	**MI01**	-	Result confirmed.

Analysis	**Analysis Requirements**
MI01	Faecal Coliforms and/or E.Coli: all results are presumptive unless indicated otherwise.

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Sydney WATER Laboratory Services

LABORATORY QC RESULTS

N/A - Not Applicable
PQL - Practical Quantitation Limit
LOQ - Limit of Quantification
RPD - Relative Percent Difference
SPIKE/Positive Control - Addition of a known amount and concentration
Duplicate Precision = Accepted - Result 2 within 95% confidence limits of result 1
Duplicate Precision = Outlier - Result 2 outside 95% confidence limits of result 1
Duplicate Precision = Not calculated - Result is outside test range

LOQ	Blank	Positive Control *Acceptance Criteria*	Negative Control *Acceptance Criteria*	Duplicate1	Duplicate2	Precision *Acceptance Criteria*
MI01 [Membrane Filtration]E.coli						
<1 CFU/100mL	**<1**	**Accepted**	**Accepted**	**~50**	**~41**	**Accepted**
MI01 [Membrane Filtration]Faecal Coliform						
<1 CFU/100mL	**<1**	**Accepted**	**Accepted**	**~50**	**~41**	**Accepted**
MI03AS [Membrane Filtration]Enterococci						
<1 CFU/mL	**<1**	**Accepted**	**Accepted**	**45**	**34**	**Accepted**

* Indicates NATA accreditation does not cover the performance of this service

Menangle Bridge Historical Data

Date	Batch No.	Dissolved Oxygen	Temp-erature	pH	EC	Turbidity	Total Nitrogen	Total Phosphorus	N02+NO3	TKN	Faecal coliforms	Enterococci	Chloro-phyll-a	Surface films	Oily	Cloudy	Muddy	Clear	Algae	Notes
17.01.06	1	59.5	24.66	7.96	241	7.9	600	50	21	600	-	-	8							
07.02.06	2	-	24.49	8.26	-	6.8					2	20								
14.02.06	3	-	24.86	8.5	-	8					1	17								
17.02.06	4	-	24.73	8.41	-	6.4	800	50	18	800	-	-	7							
21.02.06	5	-	25.13	8.51	459	7.5					-	-								
28.02.06	6	-	23.94	8.3		7.7					17	250								
07.03.06	7	-	24.26	8.88	-	7.7					540	1								
14.03.06	8	-	25.58	-	-	9.5					-	-								
17.03.06	9	-	23.74	8.65	-	7.4					42	6								
21.03.06	10	-	22.35	8.52	453	7.1	600	20	-	-	2	30								
28.03.06	11	-	21.83	8.89	1022	7.6					19	130								
04.04.06	12	-	21.97	8.8	-	10.4					240	46								
11.04.06	13	-	18.67	7.81	-	9					170	480								
14.04.06	14	-	18.99	8.35	-	9.5					540	1250								
18.04.06	15	94.4	17.86	8.59	396	10.7	400	30	-	-	46	160	6							
24.04.06	16	72.0	17.03	8.26	395	10.2														
16.05.06	17	-	15.14	8.95	390	11.9	900	20	-	-	-	-	5							
20.06.05	18	-	-	-	-	-	700	10	-	-	-	-	5							
16.11.06	19	91.1	19.2	8.48	762	0.9	500	10	-	-	-	-	5							
06.12.06	20	108.2	24.46	8.95	752	-														
08.12.06	21	90.5	24.2	8.94	722	-					10	80								
13.12.06	22	-	22.51	8.73	712	-	400	10	10	400	5	14	5							
15.12.06	23	96.7	23.82	9.11	1100	0.707					2	5								
19.12.06	24	112.5	23.39	8.99	705	1.2					2	5								
03.01.07	25	-	23.2	9.35	663	8.6					160	400	5							
10.01.07	26	130.0	24.95	9.6	664	8.8	700	25					5							
17.01.07	27	103.8	27.2	9.3	674	4.8					17	4								
24.01.07	28	115.0	26.92	9.2	695	3					140	450	5							
01.02.07	29	91.9	24.7	8.53	350	3.6					12	2	5							
06.02.07	30	130.1	25.85	9.11	73	0.12														
13.02.07	31	76.8	21.6	7.9	543	88.2					10000	1400								
20.02.07	32	77.0	25.2	8	350	12.1					90	460								
23.02.07	33	71.3	25.28	8.2	365	9.8					10	40								
28.02.07	34	64.6	24.46	8.33	425	7.6					140	65								
07.03.07	35	81.8	23.1	8.25	320	15	2100	90	-	-	90	60	1							
14.03.07	36	71.2	22.54	7.94	344	11.6					50	40								
22.03.07	37	58.3	23.1	8.3	357	4.5					40	25								
28.03.07	38	53.2	22.32	8.25	361	4.8					30	12								
30.03.07	39	47.7	21.1	8.6	368	3.8					30	280								
03.04.07	40	58.9	20.71	8.23	377	2.3	1000	30	121	800	320	34	2							
10.04.07	41	57.7	21.27	8.25	405	0.7					40	30	-							
18.04.07	42	45.1	21.08	8.46	394	1.6					440	6	-							
24.04.07	43	40.0	19.13	8.3	388	1.3					30	50	-							
27.04.07	44	33.0	18.2	8.2	378	3.7					18	350	-							
02.05.07	45	28.4	18.21	8.63	395	1.5	800	60	10	800	150	10	1							
05.06.07	46	95.1	10.8	9.04	513	3.4	600	40	10	600	1600	70	17							
03.07.07	1	93.2	11	10.26	244	18.2	1200	60	279	900	78	10	1							
01.08.07	2	87.9	10.18	9.12	277	9.9	800	10	15	800	6	30	14							
06.09.07	3	99.8	14.61	9.61	504	10.1	700	150	10	700	5	10	24							
09.10.07	4	-	-	-	-	-	500	20	26	500	10	30	6							
1.11.07	5	95.5	22	8.91	673	2.8	500	40	16	500	20	30	5	X		X				
8.11.07	6	85.2	19.7	8.81	529	1					45	220						X		
15.11.07	7	96.8	23.4	8.52	472	3.3					150	80	1			X				
22.11.07	8	82.0	25.1	8.55	471	2					20	10						X		
28.11.07	9	97.0	23.46	8.37	463	0.3					50	60						X		
06.12.07	10	79.0	26.09	8.41	479	3.4	500	20	10	500	200	280	5							
13.12.07	11	94.4	21.9	8.53	526	8.6					25	20						X		
20.12.07	12	89.7	22.82	8.82	660	6.7					250	1600		X		X			X	
27.12.07	13	71.5	22.93	8.51	728	4.2					3700	150				X				
03.01.08	14	72.4	25.9	8.81	763	3.1					50	12		X				X		
11.01.08	15	99.3	26.3	8.88	783	-	7100	100	10	7100	40	2	1					X		

Menangle Bridge Historical Data

Date	Batch No.	Dissolved Oxygen	Temp-erature	pH	EC	Turbidity	Total Nitrogen	Total Phosphorus	N02+NO3	TKN	Faecal coliforms	Enterococci	Chloro-phyll-a	Surface films	Oily	Cloudy	Muddy	Clear	Algae	Notes
17.01.08	16	84.0	24	8.8	768	-					75	180								
24.01.08	17	123.7	23.6	7.88	731	12.4					15	35		X				X		
31.01.08	18	115.4	26.94	8.03	761	12.4					30	30					X			
7.02.08	19	113.8	21.21	8.56	146	48.7					6800	300								
15.02.08	20	129.6	21	8.51	163	39.1					150	90								
22.02.08	21	120.1	22.66	8.35	193	14					10	30								
29.02.08	22	77.9	21.58	8.4	189	19.3					360	90					X			
5.03.08	23	71.6	22.1	8.45	202	14					15	25								
11.03.08	24	77.5	22.53	7.86	203	14					12	55								
19.03.08	25	77.3	22.3	8.4	201	14.1	300	40	16	300	7	70	1							
25.03.08	26	100.6	22.3	8.56	278	15.2					20	200		X			X	X		
01.04.08	27	87.1	19.54	8	296	14.6					14	48								
07.04.08	28	140.0	19.38	8.7	293	11.8					2	20								
15.04.08	29	99.5	17.8	8.43	322	11					35	60		X			X			
22.04.08	30	117.1	17.94	8.59	348	16.5	400	10	23	400	30	200	147							
29.04.08	31	130.0	16.69	9	367	10.9					20	75								
27.05.08	32	140.6	13.48	8.18	371	14.3	600	10	218	400	50	20	1					X		
25.06.08	33	130.5	119	8.01	189	15	400	50	214	200	2	15	1					X		
01.08.08	1	144.0	10.9	8.32	310	9.2	700	50	209	500	10	160	2							
26.08.08	2	152.0	14.17	8.26	365	17.9	3600	14	130	3500	2	2	9							
30.09.08	3	120.8	17.9	8.27	476	11.5	400	60	80	300	8	4	6			X				
28.10.08	4	145.0	21.8	8.56	372	12.3	100	10	10	100	15	32	2							
26.11.08	5	87.1	21.46	7.91	359	-	100	10	20	100	40	14	3							
02.12.08	6	108.2	23.1	7.96	358	4.2					22	30						X		
09.12.08	7	117.5	23.34	8.19	363	1.9					25	20						X		
16.12.08	8	113.1	23.72	8.25	419	16					10	18						X		
23.12.08	9	96.2	24.3	8.3	480	1.3	400	140	20	400	16	10	5							
30.12.08	10	86.5	24.83	8.21	526	3					22	26						X		
06.01.09	11	78.5	25.71	8.26	541	3.5					15	26								
13.01.09	12	77.2	24.8	8.31	543	1.4					25	28					X			
20.01.09	13	84.5	27	8.35	556	8	600	90	10	600	250	10	7					X		
27.01.09	14	59.6	26.8	8.27	563	1.5					16	90						X		
29.01.09	15	53.8	27.36	8.36	565	9.1					120	50						X		Weed
03.02.09	16	45.1	27.7	8.28	570	0.4					4	10						X		Algae growth
10.02.09	17	31.2	26.12	7.94	574	3.7					8	18								
18.02.09	18	73.0	23.9	8.51	562	1.3	400	30	30	400	56	110	5					X		Algal growth
24.02.09	19	35.3	24.56	8.16	539	1.7					15	8								
27.02.09	20	47.2	24.3	8.11	543	0.9					24	42					X	X		Algae at Menangle
03.03.09	21	33.6	24.34	8.14	545	5.5					5	26								
10.03.09	22	-	22.8	8.06	546	1.1					8	50						X		Algae
17.03.09	23	-	22.34	8.06	544	4.8	400	10	10	400	40	2	1							
24.03.09	24	-	23.4	8.22	538	0.7					8	30						X		
31.03.09	25	-	22.16	8.12	520	3.4					100	110								
07.04.09	26	-	21.3	8.07	512	0.7					48	90					X			Surface scum
16.04.09	27	-	20.67	8.07	527	3	600	30	20	600	48	100	2							
22.04.09	28	-	19.5	8.04	526	1.6					34	30						X		
28.04.09	29	-	17.4	8.2	531	2.7					38	40				X				
30.04.09	30	-	16.68	8.18	530	3.9					130	130								
12.05.09	31	-	15.07	8.1	533	1.3	400	60	50	300	15	60	3							
10.06.09	32	-	12.8	8.1	356	0.3	400	20	140	200	10	2	5							
08.07.09	1	-	11.6	8.75	314	10	1300	100	200	1100	12	16	9							
4.08.09	2	37.2	10.19	9.75	372	6.2	500	10	110	400	4	2	3							
2.09.09	3	36.8	12.93	8.42	353	1	200	20	40	100	20	4	1							
30.09.09	4	38.0	18.13	8.73	368	-	100	10	10	100	28	22	1							
25.11.09	5	-	30.33	9.15	358.6	9.9	200	10	10	200	390	64	3							
01.12.09	6	98.8	24.77	8.34	363.3	7					42	50	-							
08.12.09	7	-	-	7.65	462	0.7					28	20	-							
15.12.09	8	82.7	24.07	8.06	492.9	6					7	430	-							
22.12.09	9	90.1	25.5	8.31	509.1	1.7	400	50	10	400	1400	560	3							
29.12.09	10	-	-	8.75	472	1.9					170	60								
05.01.10	11	74.6	25.7	7.61	429	10					18	18								

Menangle Bridge Historical Data

Date	Batch No.	Dissolved Oxygen	Temp-erature	pH	EC	Turbidity	Total Nitrogen	Total Phosphorus	N02+NO3	TKN	Faecal coliforms	Enterococci	Chloro-phyll-a	Surface films	Oily	Cloudy	Muddy	Clear	Algae	Notes
12.01.10	12	78.1	26.64	7.98	415	3					10	32								
19.01.10	13	81.5	23.8	7.67	324.2	2	400	10	10	400	10	120	2							
26.01.10	14	53.4	26.3	7.72	384	3					24	30								
29.01.10	15	78.0	26.85	7.48	394	5					1700	240								
02.02.10	16	83.4	26.2	7.38	360	12					150	290								
10.02.10	17	60.3	26	7.37	375	9					460	420								
16.02.10	18	71.0	24.42	7.1	296.6	8.8	700	20	40	700	210	100	13							
23.2.10	19	66.0	27	7.16	268.5	10					5	18								
26.2.10	20	-	-	-	-	-					-	-								
3.3.10	21	81.5	23.8	7.46	238	7					7	12								
9.3.10	22	-	25.36	8.77	372.3	13					13	62							X	
16.3.10	23	81.2	23.5	7.84	340.5	3.6	500	80	60	400	5	42	47							
23.3.10	24	78.0	22	7.77	274.5	1.5					5	50								
31.3.10	25	69.5	21.65	7.3	367.1	3.6					86	110								
06.04.10	26	-	-	-	-	-					-	-								
13.04.10	27	96.4	20.14	7.71	374	1	600	10	40	600	24	24	3							
20.04.10	28	-	-	-	-	-					-	-								
28.04.10	29	69.3	19.5	7.83	395.2	0.4					26	10								
05.05.10	30	-	-	-	-	-					20	6								
18.05.10	31	96.2	14.59	7.34	458.9	1	100	40	40	100	160	550	6							
15.06.10	32	68.6	11.29	7.15	212	4	900	40	320	600	26	38	1							
06.07.10	1	78.1	10.85	7.16	172.4	2.1	400	10	110	300	2	20	3							
03.08.10	2	97.8	11.88	7.59	253.8	3.4	900	150	120	800	2000	6700	4							
03.09.10	3	96.4	14.45	7.1	272.4	0.5	500	110	60	400	340	510	11							
29.09.10	4	94.2	17.38	8.36	143.4	0.1	300	70	90	200	24	16	3							
29.10.10	5	115.1	18.97	7.56	144	1.2	400	50	20	400	2	8	1							
23.11.10	6	122.6	23.03	7.53	214.6	0.1	700	10	60	600	600	60	3							
02.12.10	7	73.5	21.68	8.05	26600	155.7					240	1100				X	X			
10.12.10	8	-	-	-	-	-					50	50								
14.12.10	9	105.4	23.46	6.86	132.2	27.1					20	100								
23.12.10	10	107.9	24	6.97	143	1.9	400	10	60	300	24	10	9							
31.12.10	11	-	-	-	-	-					230	16								
04.01.11	12	106.4	23.56	7.78	78.6	1					50	16								
10.01.11	13	-	-	-	-	-					50	300								
19.01.11	14	94.2	24.71	7.49	215	3.1	400	100	60	300	13	38	2							
24.01.11	15	-	-	-	-	-					280	20								
02.02.11	16	-	-	-	-	-					530	130								
07.02.11	17	-	-	-	-	-					120	30								
11.02.11	18	100.3	24.85	7.15	1730	1.5	200	40	40	200	1300	38	7							
21.02.11	19	104.7	25.23	7.33	241.5	0.5					38	46								
01.03.11	20	-	-	-	-	-					60	1000								
07.03.11	21	-	-	-	-	-					42	14								
15.03.11	22	100.5	22.63	7.63	182.5	0.1	300	210	10	300	620	2200	3							
24.03.11	23	-	-	-	-	-					260	82								
28.03.11	24	-	-	-	-	-					180	1100								
04.04.11	25	102.9	22.9	7.11	1200	10.1					42	30								
15.04.11	26	98.2	17.64	6.18	124.6	0.8	700	50	60	600	18	50	2							
21.04.11	27	-	-	-	-	-					-	-								
27.04.11	28	-	-	-	-	-					18	20								
27.05.11	29	-	-	-	-	-	100	10	-	-	26	64	22							
24.06.11	30	-	-	-	-	-	200	30	170	100	2	6	1							
06.07.11	1	-	-	-	-	-	400	10	100	300	6	12	5							Change in LOR for ChlA
03.08.11	2	123.5	15.83	7.51	184	3.1	300	10	60	200	3	7	2							
07.09.11	3	98.0	16.34	6.7	234.9	2.1	300	40	70	200	4	4	15					X		
06.10.11	4	101.0	16.97	6.81	9000	7.7	600	10	380	200	26	18	4							
08.11.11	5	84.2	25.28	7.43	1456	3.1	500	10	40	500	130	56	1					X		
13.12.11	6	72.7	19.47	7.6	159	3.9	700	10	90	600	56	980	1							
16.12.11	7	98.5	20.04	7.34	156.8	2.8					34	28								
20.12.11	8	97.3	21.27	6.99	15600	7.6					82	28								
29.12.11	9	100.4	22.15	7.14	139.2	4.6					12	12								
06.01.12	10	89.2	23.24	6.99	158	3.9	300	20	10	300	6	32	3							

Menangle Bridge Historical Data

Date	Batch No.	Dissolved Oxygen	Temp-erature	pH	EC	Turbidity	Total Nitrogen	Total Phosphorus	N02+NO3	TKN	Faecal coliforms	Enterococci	Chloro-phyll-a	Surface films	Oily	Cloudy	Muddy	Clear	Algae	Notes
11.01.12	11	96.2	24.89	7.57	174.2	1.8					3	28								
17.01.12	12	98.2	26.06	6.92	154.2	6.4					300	1200								
25.01.12	13	96.2	23.24	7.58	153.4	1.9					2100	100								
02.02.12	14	93.4	20.15	7.25	151.1	4.7	300	10	20	300	10	42	2							
03.02.12	15	96.1	20.73	7.08	104.6	2.1					20	26								
07.02.12	16	107.9	22.58	7.27	183.9	14.5					40	84								
16.02.12	17	91.7	23.16	7.09	191.6	8.7					250	140								
23.02.12	18	-	-	-	-	-					160	70								
08.03.12	19	84.1	19.03	6.96	123.1	20.5	700	90	130	600	2700	980	2							
12.03.12	20	61.1	24.33	7.52	189.2	8.3					190	100								
14.03.12	21	94.5	22.13	6.8	121.4	6.2					36	30								
22.03.12	22	94.0	20.82	6.76	103.8	13.3					36	50				X	X			
04.04.12	23	-	24.4	7.69	136.3	3.1	600	10	100	500	120	40	2							%DO sensor issue?
10.04.12	24	113.5	21.86	8.38	168	4.2					16	22								
16.04.12	25	103.2	20.38	7.82	154	5.5					7	20								
23.04.12	26	92.5	19.34	7.89	149.6	17.4					260	170								
30.04.12	27	91.6	18.13	7.31	133.7	2.8					24	22								
10.05.12	28	94.9	16.3	6.85	155.3	6.2	1400	420	-	-	16	10	1	X		X	X		X	
13.06.12	29	96.9	13.94	7.8	129.9	12.3	600	90	-	-	430	1200	2			X	X			
03.07.12	1	103.2	11.55	7.66	122.4	4.1	500	10	120	400	6	12	2					X		
08.08.12	2	104.6	10.7	7.82	170.5	0.6	500	40	300	190	4	14	2					X		
05.09.12	3	105.5	16.4	7.1	139.6	1.1	300	10	70	200	10	8	3							
03.10.12	4	97.2	17.55	7.59	227	3.8	300	40	20	300	1200	14	6					X		
06.11.12	5	86.2	21.63	7.45	205.6	-	400	40	20	400	6	16	2					X		
04.12.12	6	93.2	23.13	7.03	228.5	1.7	300	20	30	300	8	14	2							
10.12.12	7	93.7	22.05	7.43	229.4	0.4					26	16								
17.12.12	8	95.5	22.31	7.6	193.1	0.7					18	20								
24.12.12	9	102.9	29.21	7.7	290	2.4					60	26								
31.12.12	10	103.6	25.85	7.63	303	0.3					12	110								
07.01.13	11	96.1	28.64	8.29	469	4.8					380	14								
09.01.13	12	86.6	25.75	7.44	328	1.4	300	20	10	300	56	10	3							
14.01.13	13	91.7	26.43	7.76	297.8	0.3					6	4								
21.01.13	14	97.1	24.48	7.79	282.5	1.3					2600	470								
31.1.13	15	93.2	22.75	6.39	152	17.7					400	38								
6.02.13	16	82.5	25.46	6.93	219	12.1					270	36				X	X			
07.02.13	17	95.2	20.32	6.63	217	16.3	1400	40	500	900	400	68	16				X	X		
11.02.13	18	99.7	24.09	6.9	186	6.4					30	54						X		
18.02.13	19	102.1	24.46	7.56	164	13.1					150	18						X	X	
27.02.13	20	92.7	26.58	7.14	146	9.4					1000	900					X	X		
04.03.13	21	109.7	24.9	6.56	130	9					620	700					X	X		
07.03.13	22	88.0	19.94	6.52	128	6.7	400	10	140	300	100	74	3				X	X		
12.03.13	23	102.7	23.9	6.89	133	4.4					37	21						X		
22.03.13	24	97.1	22.55	7.03	144	3.2					20	10						X		
25.03.13	25	93.3	22.76	7.06	152	2.6					3	20						X		
04.04.13	26	92.7	19.45	6.98	158	2.2	300	10	100	200	12	100	3					X		
05.04.13	27	91.2	20.73	7.59	165	3.2					18	26						X		
08.04.13	28	94.2	21.61	7.02	163	2.5					24	22						X		
15.04.13	29	95.5	20.47	6.82	155	3.9					6	10						X		
24.04.13	30	97.6	19.48	7.3	202	5.2					230	390						X		
01.05.13	31	98.4	18.62	7.41	250	2.6					12	2						X		
10.05.13	32	87.5	13.87	7.51	213	1.8	500	10	240	300	5	14	1					X		
07.06.13	33	94.7	12.98	7.31	187	1.9	500	10	160	300	10	14	1							
03.07.13	1	-	-	-	-	-	1100	30	460	600	80	80	1							
17.07.13	1	99.2	11.48	6.68	147	4.5	500	20	180	300	8	20	1					X		
07.08.13	2	98.0	10.52	7.26	222	1.3	600	10	320	300	2	8	2					X		
10.09.13	3	95.3	15.63	7.35	187	6.4	600	20	60	500	18	46	3					X		
22.10.13	4	94.7	20.36	7.11	141	2.1	300	20	10	300	36	44	9					X		
14.11.13	5	93.5	19.88	7.33	222	2.6	400	30	10	400	42	76	4					X		
03.12.13	6	101.3	23.31	6.99	153	2.8					26	58						X		
11.12.13	7	99.5	24.31	7.12	152	4.5					20	120						X		
13.12.13	8	87.7	23.47	7.28	157	1.4	200	10	10	200	14	8	2					X		

Menangle Bridge Historical Data

Date	Batch No.	Dissolved Oxygen	Temp-erature	pH	EC	Turbidity	Total Nitrogen	Total Phosphorus	N02+NO3	TKN	Faecal coliforms	Enterococci	Chloro-phyll-a	Surface films	Oily	Cloudy	Muddy	Clear	Algae	Notes
17.12.13	9	89.7	25.68	7.12	156	1.8					22	3						X		
24.12.13	10	86.7	24.1	7.09	184	0.4					20	13						X		
02.01.14	11	91.4	25.6	6.9	188	1.1					15	6						X		
10.01.14	12	89.0	23.5	6.88	220	0.9	200	10	30	200	11	20	2					X		
17.01.14	13	96.3	27.97	7.03	218	1.5					24	32		X				X		
23.01.14	14	90.7	24.67	6.8	202	0.3					18	2						X		
29.01.14	15	93.6	24.38	7.47	193	1.6					120	230						X		
04.02.14	16	88.5	25.34	7.17	182	0.7					7	36						X		
05.02.14	17	83.3	22.92	6.61	183	3.9	800	20	50	700	20	60	1					X		
10.02.14	18	92.8	26.25	7.13	176	1.6					16	6						X		
17.02.14	19	93.1	24.13	7.47	171	2.8					88	68						X		
24.02.14	20	95.7	24.91	7.1	187	3					12	4						X		Weed spraying along river banks
03.03.14	21	91.6	23.06	7.18	194	3.3					220	110						X		
5.03.14	22	85.8	21.4	7	196	4.4	100	10	80	100	30	50	3					X		
10.03.14	23	98.7	23.3	7.4	264	0.8					20	16						X		
18.03.14	24	103.9	23.54	7.43	206	4.7					18	24						X		
24.03.14	25	96.1	21.64	6.9	144	4.4					320	450								
02.04.14	26	-	19.53	7.21	107	5.3	400	20	200	200	140	120	1							
08.04.14	27	99.0	20.45	7.07	131	10.4					110	26								
14.04.14	28	98.4	19	7.86	106	3.5					70	16								
22.04.14	29	88.5	19.4	6.94	123	2.1					26	40								
28.04.14	30	91.3	19.02	7.02	145	2.1					10	40								
08.05.14	31	91.2	13.62	6.53	105	1.4	400	10	160	200	6	14	2							
12.06.14	32	82.4	12.6	7.84	186	3.6	400	10	300	140	6	8	1					X	X	
01.07.14	1	68.2	10.1	6.91	216	0.8	1000	20	360	600	350	2	1				X	X		
04.08.14	2	84.2	10.8	6.73	197	1.9	300	10	110	200	7	12	2					X		
03.09.14	3	88.0	12.1	6.3	73	9.9	400	10	230	200	24	30	1					X		Elevated flows following rain
04.10.14	4	81.4	17.1	7.33	120	3.4	600	50	200	400	10	25	4					X		
03.11.14	5	90.1	21.5	6.93	153	8.4	300	10	70	200	15	21	2					X		
03.12.14	6	56.5	25.4	6.16	136	0.2	500	20	80	400	50	48	2					X		
08.12.14	7	93.8	24	6.48	143	0.3					110	90						X		
12.12.14	8	85.6	21.9	6.08	260	0.9					10	18						X		
18.12.14	9	97.2	23.4	6.39	195	2					6	24						X		People swimming
24.12.14	10	85.5	24.3	6.51	196.7	2.53					15	40		X				X		Tannin stained, lots of rubbish, oily films in still water
02.01.15	11	96.5	21.9	6.18	226	3.1	400	10	160	200	8	28	3					X		
08.01.15	12	91.9	26.2	6.66	228	2.01					3	34		X						SF - Pollen, dust and duck faeces, Tannin stained
14.01.15	13	85.1	25.6	6.64	223	3.05					86	66						X		Tannin stained, higher water level compared to previous visits
20.01.15	14	77.1	24.4	7.5	214.3	2.29					10	21						X		Low water level
27.01.15	15	84.5	24.2	7.24	141.2	1.19					26	28						X		
02.02.15	16	81.1	22.8	7.69	265.8	9.16					18	20				X				
06.02.15	17	89.1	23	7.58	256	7	800	20	340	500	2	30	3					X		Appeared more turbid
12.02.15	18	87.5	23.2	7.43	172	3.15					-	-		X				X		
18.02.15	19	83.1	23.7	7.68	138.8	2.38					14	12		X				X		
24.02.15	20	79.6	24.1	7.48	132.9	4.53					22	62		X				X		
03.03.15	21	89.7	23.9	7.58	194.6	2					15	62						X		
06.03.15	22	95.3	22.7	7.76	258	2.74	100	20	140	100	3	30	1					X		
12.03.15	23	94.5	24.2	7.03	210	3.2					16	38								
18.03.15	24	80.7	21.1	6.97	168	2.9					8	17								
24.03.15	25	89.6	22	6.86	162	0.8					6	700								
30.03.15	26	82.3	21.8	6.83	176	0.9					6	380								
07.04.15	27	96.7	19.4	7.74	122	2.3	600	10	240	400	16	18	1					X		Water levels increased due to rain
13.04.15	28	84.3	19.2	7.58	190	2.9					10	9						X		
17.04.15	29	91.2	19.4	7.11	159	2.9					21	40						X		
27.04.15	30	82.1	15.4	6.91	110	8.6					220	290						X		Water levels higher than usual, subsided after flood. Surface foams present
01.05.15	31	68.2	10.1	6.91	216	0.8	400	10	150	200	120	48	2				X	X		
05.06.2015	32	92.4	12.3	7.37	152	2.7	500	10	180	300	8	2	2					X		
03.7.2015	1	87.6	9.7	7.34	209	3.8	600	10	420	200	7	5	1					X		
7.8.2015	2	74.1	10.1	8.03	147	2.8	400	10	230	200	3	9	5					X		

Menangle Bridge Historical Data

Date	Batch No.	Dissolved Oxygen	Temp-erature	pH	EC	Turbidity	Total Nitrogen	Total Phosphorus	N02+NO3	TKN	Faecal coliforms	Enterococci	Chloro-phyll-a	Surface films	Oily	Cloudy	Muddy	Clear	Algae	Notes
4.09.2015	3	61.6	11.9	7.14	52	6.37	400	10	160	200	24	28	5					X		
2.10.2015	4	74.8	14.9	7.2	147	2.2	300	10	130	200	72	40	1					X		
6.11.2015	5	83.4	16.9	7.28	167	4.2	400	10	100	300	1500	1500	1					X		Elevated waterlevels due to heavy rainfall prior
4.12.2015	6	58.9	21.9	6.76	149	1.39	300	10	40	300	6	10	2					X		
10.12.205	7	65.5	23.6	6.94	297	1.5					56	50						X		
16.12.2015	8	92.4	22.1	7.09	251.2	2.6					34	46						X		Tannin stained, murky from floating duck faeces
22.12.2015	9	45.7	20.4	6.89	173	2.7					580	40						X		
28.12.2015	10	65.6	20.8	6.74	208	1.9					6	8						X		
8.1.2016	11	62.5	20.9	7.13	239	6.9					120	220					X			
11.1.2016	12	44.1	21.3	7.32	310	0.4	400	10	110	300	280	150	1					X		
14.1.2016	13	74.6	21.8	7.18	340	1.2					32	28						X		
20.1.2016	14	78.7	23.2	6.97	172	2.1					34	2						X		
26.1.2016	15	71.9	22.8	7.04	155	3.4					10	31						X		
5.02.2016	16	89.1	21.8	7.39	162	1.3	500	10	160	300	67	50	1				X			
11.02.2016	17	82.6	23.4	7.17	181	2.8					52	74						X		
17.02.2016	18	92.6	23.4	6.98	130	2.2					8	32						X		
23.02.2016	19	89.2	25.6	7.02	128	2					300	40						X		
29.02.2016	20	78.4	22.3	7.08	1238	1.8					8	26	1					X		
04.03.2016	21	89.2	24.3	6.58	101	1.9	100	20	20	100	16	18	1					X		Low water level
10.03.2016	22	80.6	23.8	6.98	143	2.3					10	28						X		
16.03.2016	23	88.6	23.2	6.89	171	2.9					25	22						X		
22.03.2016	24	91.8	22.8	6.94	211	2.1					17	28						X		
29.03.2016	25	81.5	20.1	6.33	187	0.9					10	24						X		
01.04.2016	26	79.8	22.2	7.41	141	0.3	400	10	50	300	8	16	1					X		
7.04.2016	27	84.6	19.7	7.03	197	1.1					15	21						X		
13.04.2016	28	78.7	20.1	7.11	191	0.9					21	12						X		
19.04.2016	29	82.4	19.6	6.73	179	0.9					28	70						X		
26.04.2016	30	76.4	19.1	6.81	177	0.9					62	38						X		Very low water line
6.05.2016	31	83.1	16.6	5.71	176	1	300	10	60	200	12	16	1					X		Low water level
3.06.2016	32	83.5	12.3	8.03	218	7.1	300	10	100	200	8	16	1					X		Low water level
1.07.2016	1	64.6	9.7	7.11	132	19.7	500	10	210	300	4	8	1				X			Evidence of heavy flows noted, river bed covered by biofilm
5.08.2016	2	78.7	9.7	6.37	140	5.4	400	10	200	200	11	18	2					X		Raining and high flows
1.09.2016	3	64.4	12.3	7.16	190	1.38	300	10	110	200	34	50	2					X		
7.10.2016	4	54.4	18.7	8.44	100	1.47	400	10	80	300	1	5	2					X		
2.11.2016	5	77.5	18	6.81	128	2.1	400	40	100	300	56	17	1					X		
1.12.2016	6	75.4	24.5	7.84	202	2.7	300	10	10	300	100	36	5					X		
8.12.2016	7	81.3	24.7	7.36	246	3.2					340	180						X		
14.12.2016	8	74.2	25.1	7.31	381	3.6					34	150						X		
20.12.2016	9	71.4	22.6	7.22	196	2.8					32	44						X		
28.12.2016	10	73.7	24.7	7.58	207	3					72	90						X		
6.01.2017	11	75.1	23.3	7.52	211	2.2	200	10	10	200	65	55	2					X		
12.01.2017	12	63.9	26.1	7.16	210	2.8					100	55						X		
18.01.2017	13	71.6	25.2	7.02	169	2.4					20	30						X		Very hot sampling day - 30 deg Cat 6.30am
24.01.2017	14	83.2	27.1	6.38	168	3.7					14	22						X		Very hot conditions prevail
30.01.2017	15	76.4	26.8	6.91	150	2.4					28	52						X		Very hot conditions prevail, low flow noted
3.02.2017	16	41.8	25.1	7.47	133	2.9	200	10	20	200	24	26	1					X		
9.02.2017	17	78.3	25.8	6.96	264	2.8					430	220						X		Heavy rain prior to sampling
15.02.2017	18	76.8	26.8	6.99	150	1.7					16	22						X		
21.02.2017	19	72.1	26.4	7.18	228	2.4					26	19						X		
27.02.2017	20	81.3	23.7	7.28	296	1.9					220	5000						X		Water levels slightly higher after rain
02.03.2017	21	83.5	24	6.89	185	3.4	400	10	90	300	200	490	2					X		Heavy to medium rainfall during sampling
09.03.2017	22	82.7	22.7	7.06	194	2.7					12	34						X		Constant rain prior to sampling
15.03.2017	23	80.9	22.4	7.11	181	2.9					82	50						X		Heavy rain prior to sampling, water levels higher than usual
21.03.2017	24	94.8	24	6.96	102	2.4					360	110						X		River levels higher than normal
28.03.2017	25	82.7	23.3	7.28	207	3.1					26	10						X		
03.04.2017	26	84.2	18.9	7.33	198	2.8					72	44					X			

Menangle Bridge Historical Data

Date	Batch No.	Dissolved Oxygen	Temp-erature	pH	EC	Turbidity	Total Nitrogen	Total Phosphorus	N02+NO3	TKN	Faecal coliforms	Enterococci	Chloro-phyll-a	Surface films	Oily	Cloudy	Muddy	Clear	Algae	Notes
06.04.2017	27	91.6	18.1	6.82	136	2.5	500	10	120	400	64	20	2					X		
13.04.2017	28	87.2	18.1	7.44	221	3.2					7	10						X		
18.04.2017	29	79.6	17.5	7.74	278	1.9					7	34						X		
24.04.2017	30	86.8	17.1	7.66	275	2.3					7	26						X		
04.05.2017	31	83.6	17.6	7.39	117	7.4	400	10	100	300	8	12	2					X		
02.06.2017	32	90.4	12.2	6.88	151	2.4	300	10	140	200	24	18	2					X		
07.07.2017	S171674	81.4	11.5	7.21	133	2.2	500	10	180	300	4	25	1					X		
03.08.2017	S171914	88.4	11.4	6.97	119	1.4	400	10	150	300	14	12	2					X		
01.09.2017	S172185	81.5	11.2	7.18	126	1.9	300	10	130	200	14	9	7					X		
06.10.2017	S172497	78.1	19.4	7.09	118.2	3	1300	140	70	1200	200	180	2					X		
03.11.2017	S172761	74.6	19.8	9.92	187	1.4	400	10	50	300	57	180	2					X		
01.12.2017	S173041	79.1	25.4	7.96	239	4.2	200	10	30	200	9	8	1					X		
07.12.2017	S173095	87.6	25.6	6.52	228.9	2.7					13	16						X		
13.12.2017	S173165	12.9	29.7	8.07	238	1.7					31	8						X		
19.12.2017	S173221	96.5	26.6	7.46	210.9	0.46					12	27						X		
27.12.2017	S173284	87.6	25.3	7.61	314	0.8					16	16						X		
05.01.2018	S180123	89.3	24.6	7.91	277	1.9	300	10	10	300	17	6	2					X		
11.01.2018	S180164	90.7	25.1	7.68	317	1.4					28	6						X		
17.01.2018	S180211	92.1	26.8	7.86	322	1.9					20	3						X		
23.01.2017	S180269	84.3	27.1	7.98	304	2.3					380	140						X		
29.01.2017	S180320	78.9	26.8	8.16	361	2.8					210	30						X		
01.02.2018	S180362	50.2	26.3	7.78	306	1.1	200	10	40	200	37	3	2					X		
08.02.2018	S180431	78.5	26.6	7.84	298	2.3					100	240						X		
14.02.2018	S180480	83.7	26.9	7.96	314	3.1					68	51						X		
20.02.2018	S180531	77.4	25.7	7.27	277	4.8					3700	660						X		
26.01.2018	S180594	84.9	24.3	7.19	395	6.8					6100	1800						X		
01.03.2018	S180643	76.5	26.4	8.19	204	1.1	500	10	60	400	360	51	5					X		
08.03.2018	S180706	85.7	26.5	8.03	286	2.3					13	70						X		
14.03.2018	S180775	82.3	25.9	7.92	304	3.7					100	90						X		
20.03.2018	S180888	87.4	24.8	7.98	288	2.1					40	1						X		
26.03.2018	S180833	92.1	24.6	7.87	297	3.9					38	230						X		
05.04.2018	S180984	101.8	25.1	7.37	123	2.7	300	10	40	300	75	36	16					X		
11.04.2018	S181035	84.7	24.4	7.87	137.5	-					1300	110						X		No Turbidity recorded. Fualty meter
17.04.2018	S181100	-	-	-	-	-					60	14								
23.04.2018	S181153	-	-	-	-	-					33	30						X		
27.04.2018	S181195	82.0	20	7.94	163.1	7.26					8600	830					X			People swimming
01.05.2018	S181240	88.2	22	7.49	189.6	1.59	300	10	30	300	24	5	6					X		
04.06.2018	S181615	91.9	14.7	8.03	158	4.2	200	10	30	200	30	16	12					X		
05.07.2018	S181980	83.6	11.8	7.84	176	2.7	200	20	50	200	90	150	4	X			X			
03.08.2018	S182276	94.6	10.2	7.52	374	0.8	200	10	30	200	3	16	2				X			
06.09.2018	S182641	86.1	14.8	7.36	240	2.2	200	10	10	200	7	15	6					X		
10.10.2018	S182997	81.1	17.5	8.5	290	11.7	200	10	10	200	49	10	3					X		
5.11.2018	S183287	76.1	26.7	8.13	255	4.08	200	10	20	200	60	20	5					X	X (Minor	low
6.12.2018	S183665	82.6	25.3	7.46	317	11.87	700	10	310	400	240	39	3				x			
12.12.2018	S183738	75.2	24.8	8.02	244	1.92					100	33					x			
18.12.2018	S183820	86.2	25.2	7.9	165	7.96					160	100					X			
24.12.2018	S183897	71.4	23.4	8.25	249	2.91					16	6								
31.12.2018	S183914	83.6	29.1	6.91	173.4	1.49					44	14								
4.01.2019	S190020	74.6	29.6	7.78	149.4	1.26	3400	200	20	3400	54	18	23					X		Normal Flow
10.01.2019	S190063	74.5	26.2	8.36	161.8	6.89					54	17						x		
16.01.2019	S190135	91.1	26.1	7.62	178.4	2.83					48	81						x		
22.01.2019	S190199	72.4	28.1	7.97	112.6	3.5					210	90						x		
29.01.2019	S190267	62.4	28.8	7.97	109.4	2.76					34	21						x		
04.02.2019	S190331	71.9	28.3	7.42	167	3.53					44	6						x		
08.02.2019	S190398	77.2	33.3	7.67	281	1.5	800	10	10	800	110	12	37					X		
14.02.2019	S190466	78.2	26.6	8.13	140.3	2.69					70	8						x		
20.02.2019	S190524	61.4	25.3	7.82	181.3	4.23					8	100						x		
26.02.2019	S190583	66.1	20.9	7.67	240	2.03					41	61						x		
04.03.2019	S190652	72.5	26.9	8.13	229	5.48	600	20	20	600	48	7	2	x				x		
08.03.2019	S190717	67.4	24.2	8.29	235	3.23					24	4						x		
14.03.2019	S190774	79.4	23.8	8.63	308	1.6					23	11						x		

Menangle Bridge Historical Data

Date	Batch No.	Dissolved Oxygen	Temp-erature	pH	EC	Turbidity	Total Nitrogen	Total Phosphorus	N02+NO3	TKN	Faecal coliforms	Enterococci	Chloro-phyll-a	Surface films	Oily	Cloudy	Muddy	Clear	Algae	Notes
20.3.2019	S190851	68.0	24.1	7.4	300	10.14					1100	510					x			
26.3.2019	S1909164		23.5	7.96	314	6.03					26	24						x		
01.04.2019	S190985	66.6	18.7	8.36	127.5	6.64					22	30						x		
05.04.2019	S191055	80.1	21.5	6.94	211	13	600	10	210	400	15	35	3				x			
11.04.2019	S191122	84.6	20.4	8.14	128.3	7.73					11	14						x		
17.04.2019	S191204	67.9	19.1	7.6	144.1	2.61					4	3						x		
23.04.2019	S191244	86.8	20.3	8.49	132.9	4.24					22	34								
29.04.2019	S191274	64.9	17.3	8.19	148.2	2.86					15	32								
03.05.2019	S191274	72.3	20	7.65	172	0.67	300	30	130	200	32	12	2				x			
07.06.2019	S191760	81.0	14.2	7.36	213	6.96	400	10	-	-	4	120	3				X			
05.07.2019	S192103	82.0	14.9	7.84	101.5	3.72	700	10	160	500	6	10	2					X		
06.08.2019	S192478	88.5	13.4	8.14	270	2.09	100	10	140	100	3	10	1					X		
10.9.2019	1929085	88.7	13.9	7.84	1706	2.01	400	10	160	200	16	19	1					X		
01.10.2019	S193200	85.4	21.1	8.06	1186	4.59	300	10	80	200	10	7	1					X		
18.11.2019	S193801	83.6	24.4	8.21	215	6.47	1400	60	10	1400	16	40	1					X		
03.12.2019	1939911	80.3	24.8	8.25	195.1	5.32					4	1						X		
11.12.2019	1941015	82.3	24.6	8.29	215	3.9					19	13						X		
17.12.2019	1941809	72.8	25.5	8.43	318	3.62	100	10	10	100	30	9	4					X		
23.12.2019	S194257	83.8	23.8	9.04	346	3.94					64	26						X		
27.12.2019	S194271	83.5	26.6	8.82	291	12.83					86	6						X		
02.01.2020	S200003	79.1	21.5	8.36	342	14.52	400	20	40	400	1500	60	2				X			Low
08.01.2020	S200044	61.6	26.9	7.6	301	5.41					44	6						X		
14.01.2020	S200096	73.0	27	8.36	339	-					140	14						X		Probe error
20.01.2020	S200164	78.2	26.9	8.46	289	-					170	22					X			Probe error
24.01.2020	S200234	61.0	26.2	9.08	119	-					120	32					X			Probe error
31.01.2020	S200312	57.9	28.6	8.1	168	-					150	4						X		Probe error
06.02.2020	S200395	66.1	26.2	8.55	265	-					120	43					X			Flood, Probe error
12.02.2020	S200470	63.2	22.1	7.61	193	63.4					45000	280					X			Flood
18.02.2020	S200550	76.6	24.9	7.46	150.1	16.46	1100	20	600	500	120	54	1				X			
25.02.2020	S200638	-	22	9	150.1	8.04					17	16					X			
2.3.2020	S200726	-	28	7.84	81.6	6.16					260	70						X		
6.3.2020	S200790	-	24.1	6.67	111.6	3.66					300	150						X		
12.3.2020	S200861	-	23	8.34	177.1	2.96					26	12						X		
18.3.2020	S200936	-	23.4	8.62	157.9	3.55					25	30						X		
25.3.2020	S201037	70.0	22	7.58	152	11.76	700	10	330	400	15	48	2				X			
30.3.2020	S201090	77.0	22.2	8.62	146.8	2.37					13	60						X		
03.04.2020	S201157	68.8	21.5	8.66	154.6	1.61					32	38						X		
09.04.2020	S201235	87.2	21.3	7.44	106.2	3.13	500	70	270	200	9	30	1					X		
15.04.2020	S201263	82.7	25.7	7.39	132	3.31					32	12						X		
21.04.2020	S201335	78.3	18.9	7.93	170.7	4.1					10	20						X		
27.04.2020	S201411	72.6	17.8	8	205.7	4.6					16	27						X		
08.05.2020	S201584	86.0	18.3	8.26	164	2.09	600	10	300	300	100	150	1					X		
01.06.2020	S201885	88.7	15.5	8.05	235	4.18	500	30	320	200	32	28	1					X		
07.07.2020	S202333	91.6	12.2	8.35	173	2.01	300	10	270	100	2	10	26					X		
04.08.2020	S202691	102.7	14.7	8.1	114.7	73.4	600	20	310	300	16	22	2				X			
08.09.2020	S203161	83.7	20.3	8.67	134.2	7.13	500	10	210	300	15	49	4					X		
16.10.2020	S203642	83.4	19.5	7.98	226	8.04	300	10	80	200	44	210	4				X			
13.11.2020	S204026	82.8	21.7	8.28	166.9	2.98	500	10	310	200	5	11	2					X		

Menangle Bridge Water Quality Results 2022 - 2024 (Chemical data)

Sample ID	Client	Date Sampled	Report No	Test List	Sampling Point	Sp Address	Sp Desc	Sp Location	Project No	Chloro-phyll - a	Enter-ococci	Total Nitrogen	Total Phosphorus	TKN by calculation	Ammonia NH3-N Low Level	Oxidised Nitrogen NOx-N Low Level	Total Nitrogen	Total Suspended Solids
										MC01/1	MI03AS/1	NU102/1	NU102/1	NU23/1	NU40/1	NU43/1	NU57/1	WC44NS/1
										mg /m3	CFU/100mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
L22093380	ZCCC	29/11/2022 9:00	275930	ZCCC_M					5204-221129-1	7.7	15	0.38	0.019	0.27	0.01	0.11	-	<2
L23018312	ZCCC	28/02/2023 9:00	280470	ZCCC_M					5204-230228-1	16.7	71	0.44	0.031	0.44	0.01	<0.01	-	6
L23024641	ZCCC	21/03/2023 9:00	281839	ZCCC_M					5204-230321-1	24.1	~5	0.36	0.026	0.36	0.01	<0.01	0.36	9
L23033962	ZCCC	24/04/2023 9:00	283809	ZCCC_M					5204-230424-1	2.5	~6	0.31	0.013	0.19	0.03	0.12	0.31	2
L23044046	ZCCC	26/05/2023 7:00	286829	ZCCC_M					5204-230526-1	2.4	11	0.33	0.014	0.17	0.03	0.16	-	5
L23052291	ZCCC	23/06/2023 9:00	287170	ZCCC_M					5204-230623-1	3.4	78	0.4	0.011	0.27	0.02	0.13	0.4	4
L23059082	ZCCC	18/07/2023 7:00	288520	ZCCC_M					5204-230718-1	6.6	49	0.34	0.013	0.24	0.01	0.1	-	8
L23069385	ZCCC	25/08/2023 9:00	290571	ZCCC_M					5204-230825-1	7.7	34	0.3	0.012	0.25	0.01	0.05		5
L23078261	ZCCC	28/09/2023 9:00	292173	ZCCC_M						4.7	33	0.28	0.013	0.26	0.01	0.02		3
L23086473	ZCCC	30/10/2023 10:00	293826	ZCCC_M					5204-231030-1	1.8	32	0.26	0.013	0.25	0.01	0.01		4
L23095656	ZCCC	1/12/2023 7:30	295830	ZCCC_M					5204-231201-2	3.7	1900	1.2	0.16	0.69	0.08	0.51		130
L24006144	ZCCC	15/01/2024 7:30	298201	ZCCC_M					5734-240115-2		46	0.37	0.025		0.02			34
L24016639	ZCCC	13/02/2024 7:00	299701	ZCCC_M					5734-240213-6	2.5	35	0.29	0.015		0.01			3
L24026093	ZCCC	11/03/2024 7:00	301613	ZCCC_M					5734-240311-2	4.9	~10	0.39	0.031		0.02			20
L24037868	ZCCC	22/04/2024 7:00	304295	ZCCC_M					5734-240422-1	1.4	28	0.43	0.02		0.02			18
L24042982	ZCCC	10/05/2024 7:00	305201	ZCCC_M	ZCCC_MB	Menangle Bridge	Sampling Point - Menangle Bridge (Urban Plunge Program)	Campbelltown	5734-240510-3	1.9	3000	0.46	0.039		0.03			15
L24055576	ZCCC	24/06/2024 7:00	307570	ZCCC_M	ZCCC_MB	Menangle Bridge	Sampling Point - Menangle Bridge (Urban Plunge Program)	Campbelltown	5734-240624-1	1.1	~6	0.54	0.017		0.05			3
L24006144	ZCCC	15/01/2024 7:30	298201	ZCCC_M					5734-240115-2		46	0.37	0.025		0.02			34
L24016639	ZCCC	13/02/2024 7:00	299701	ZCCC_M					5734-240213-6	2.5	35	0.29	0.015		0.01			3
L24026093	ZCCC	11/03/2024 7:00	301613	ZCCC_M					5734-240311-2	4.9	~10	0.39	0.031		0.02			20

Menangle Bridge Water Quality Results 2022 - 2024 (Chemical data)

Sample ID	Client	Date Sampled	Report No	Test List	Sampling Point	Sp Address	Sp Desc	Sp Location	Project No	Chloro-phyll - a	Enter-ococci	Total Nitrogen	Total Phosphorus	TKN by calculation	Ammonia NH3-N Low Level	Oxidised Nitrogen NOx-N Low Level	Total Nitrogen	Total Suspended Solids
										MC01/1	MI03AS/1	NU102/1	NU102/1	NU23/1	NU40/1	NU43/1	NU57/1	WC44NS/1
										mg /m3	CFU/100mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
L24037868	ZCCC	22/04/2024 7:00	304295	ZCCC_M					5734-240422-1	1.4	28	0.43	0.02		0.02			18
L24042982	ZCCC	10/05/2024 7:00	305201	ZCCC_M	ZCCC_MB	Menangle Bridge	Sampling Point - Menangle Bridge (Urban Plunge Program)	Campbelltown	5734-240510-3	1.9	3000	0.46	0.039		0.03			15
L24055576	ZCCC	24/06/2024 7:00	307570	ZCCC_M	ZCCC_MB	Menangle Bridge	Sampling Point - Menangle Bridge (Urban Plunge Program)	Campbelltown	5734-240624-1	1.1	~6	0.54	0.017		0.05			3
L24060389	ZCCC	11/07/2024 7:00	308887	ZCCC_M	ZCCC_MB	Menangle Bridge	Sampling Point - Menangle Bridge (Urban Plunge Program)	Campbelltown	5734-240711-1	3.9	25	0.5	0.038		0.02			12
L24066061	ZCCC	1/08/2024 7:00	310016	ZCCC_M	ZCCC_MB	Menangle Bridge	Sampling Point - Menangle Bridge (Urban Plunge Program)	Campbelltown	5734-240731-1	3.4	160	0.35	0.015		<0.01			3

Menangle Bridge Water Quality Results 2022 - 2024 (Algae)

Sample ID	Client	Date Sampled	Report No	Test List	Sampling Point	Sp Address	Sp Desc	Sp Location	Project No	Blue Green ASU	Blue Green Biovol	Potentially Toxic ASU	Potentially Toxic Algae	Potentially Toxic Biovol	Potentially Toxic Blue Green	Potentially Toxic Blue Green ASU	Potentially Toxic Blue Green Biovol	Total ASU	Total Algae	Total Biovol	Total Blue Green	Enter-ococci
										MA70CENT/1	MA70CENT/1	MA70CENT/1	MA70CENT/1	MA70CENT/1	MA70CENT/1	MA70CENT/1	MA70CENT/1	MA70CENT/1	MA70CENT/1	MA70CENT/1	MA70CENT/1	MI03AS/1
										ASU/mL	mm3/L	ASU/mL	cells/mL	mm3/L	cells/mL	ASU/mL	mm3/L	ASU/mL	cells/mL	mm3/L	cells/mL	CFU/100mL
L22097592	ZCCC	13/12/2022 8:00	276852	ZCCC_W					5204-221213-1	0	0	0	0	0	0	0	0	878	5830	1.16	0	
L22101292	ZCCC	28/12/2022 13:00	277195	ZCCC_W					5204-221228-1	0	0	0	0	0	0	0	0	1533	9130	1.84	0	
L22101292	ZCCC	28/12/2022 13:00	277195	ZCCC_W					5204-221228-1	0	0	0	0	0	0	0	0	1533	9130	1.84	0	
L23000506	ZCCC	3/01/2023 13:00	277429	ZCCC_W					5204-230103-1	44.1	0.021	15.3	69	0.036	0	0	0	4258	42860	4.4	15300	
L23003614	ZCCC	10/01/2023	278246	ZCCC_W					5204-230110-1	14.9	0.003	0	0	0	0	0	0	1836	16950	1.87	7070	
L23005907	ZCCC	17/01/2023 11:45	278559	ZCCC_W					5204-230117-1	17.3	0.008	5.81	207	0.005	207	5.81	0.005	2128	10390	4.04	5140	
L23008163	ZCCC	24/01/2023	278579	ZCCC_W					5204-230124-1	39.4	0.009	0	0	0	0	0	0	364.7	21560	0.175	20760	
L23011750	ZCCC	7/02/2023	279325	ZCCC_W					5204-230207-1	9.47	0.002	0	0	0	0	0	0	532.9	7040	1.05	4990	
L23016264	ZCCC	21/02/2023 0:01	280546	ZCCC_W					5204-230221-1	155	0.036	3.24	111	0.002	0	0	0	613.5	85380	0.62	81560	
L23020710	ZCCC	7/03/2023 11:00	281127	ZCCC_W					5204-230307-1	54.9	0.012	2.01	69	0.001	0	0	0	372	29200	0.576	27900	
L23022735	ZCCC	14/03/2023 11:00	282083	ZCCC_W					5204-230314-1	1.31	0	0	0	0	0	0	0	1382	3470	3.65	691	
L23026626	ZCCC	28/03/2023 13:30	283202	ZCCC_W					5204-230328-1	53.8	0.026	0	0	0	0	0	0	398	20430	0.541	19370	
L23029454	ZCCC	4/04/2023 0:01	283374	ZCCC_W					5204-230404-1	37.5	0.008	0	0	0	0	0	0	717.7	21780	0.926	19230	
L23095651	ZCCC	12/1/2023 9:00	296021	ZCCC_W					5204-231201-1	0	0	0	0	0	0	0	0	447.6	2720	0.335	0	0
L23096410	ZCCC	12/4/2023 8:30	295972	ZCCC_W					5204-231204-1	1.57	0	0	0	0	0	0	0	93.4	1680	0.121	830	0
L23099140	ZCCC	12/12/2023 8:30	296701	ZCCC_W					5204-231212-1	10.4	0.003	0	0	0	0	0	0	1200	8130	1.65	3050	0
L23101523	ZCCC	12/18/2023 8:30	296885	ZCCC_AH					5204-231218-1	59.3	0.019	0	0	0	0	0	0	756.3	19950	0.971	15130	0
L23103211	ZCCC	12/27/2023 7:30	297044	ZCCC_W					5204-231227-1	14	0.003	1.98	68	0.001	0	0	0	717.8	8070	0.868	4360	0
L24000289	ZCCC	1/2/2024 7:30	297485	ZCCC_W					5204-240102-1	0	0	0	0	0	0	0	0	463.8	2860	0.761	0	0
L24005683	ZCCC	1/12/2024 9:00	298587	ZCCC_W					5734-240112-1	90.8	0.022	53.6	1840	0.047	0	0	0	1926	53590	7.14	47230	0
L24006156	ZCCC	1/15/2024 7:30	298588	ZCCC_W					5734-240115-1	137.4	0.035	0	0	0	0	0	0	649.2	66770	0.768	64000	0
L24008874	ZCCC	1/22/2024 9:30	298937	ZCCC_W					5734-240122-1	92.1	0.035	3.82	136	0.003	136	3.82	0.003	364.5	43040	0.428	41190	0
L24011298	ZCCC	1/29/2024 9:30	299778	ZCCC_W					5734-240129-1	112.9	0.026	0	0	0	0	0	0	270.7	59970	0.195	59450	0
L24013534	ZCCC	2/5/2024 9:30	299779	ZCCC_W					5734-240205-1	121.3	0.086	0	0	0	0	0	0	453.7	66950	0.462	65200	0
L24016192	ZCCC	2/12/2024 7:30	300159	ZCCC_W					5734-240212-5	416.3	0.098	0	0	0	0	0	0	574.6	220200	0.262	219100	0
L24018938	ZCCC	2/20/2024 7:30	300496	ZCCC_W					5734-240220-2	160.3	0.038	0	0	0	0	0	0	476.7	83910	0.454	82360	0
L24020746	ZCCC	2/26/2024 7:30	301204	ZCCC_W					5734-240226-1	66.6	0.016	0	0	0	0	0	0	510.6	34610	0.524	33520	0
L24023048	ZCCC	3/4/2024 7:30	301208	ZCCC_W					5734-240304-1	70.6	0.016	15.9	544	0.013	0	0	0	728	39260	0.918	36150	0
L24026090	ZCCC	3/11/2024 7:30	302380	ZCCC_W					5734-240311-1	116.8	0.028	0	0	0	0	0	0	720.7	58150	0.908	56070	0

Menangle Bridge Water Quality Results 2022 - 2024 (Algae)

Sample ID	Client	Date Sampled	Report No	Test List	Sampling Point	Sp Address	Sp Desc	Sp Location	Project No	Blue Green ASU	Blue Green Biovol	Potentially Toxic ASU	Potentially Toxic Algae	Potentially Toxic Biovol	Potentially Toxic Blue Green	Potentially Toxic Blue Green ASU	Potentially Toxic Blue Green Biovol	Total ASU	Total Algae	Total Biovol	Total Blue Green	Enter-ococci
L24028115	ZCCC	3/18/2024 9:30	302230	ZCCC_W	ZCCC_MB	Menangle Bridge	Sampling Point - Menangle Bridge (Urban Plunge Program)	Campbelltown	5734-240318-1	239.2	0.058	5.28	181	0.004	0	0	0	1338	125200	2.21	120500	0
L24030290	ZCCC	3/26/2024 9:30	302674	ZCCC_W	ZCCC_MB	Menangle Bridge	Sampling Point - Menangle Bridge (Urban Plunge Program)	Campbelltown	5734-240326-1	333.5	0.079	26.5	907	0.023	0	0	0	796.7	178000	0.643	175500	0
L24032353	ZCCC	4/03/2024 9:30	303364	ZCCC_W	ZCCC_MB	Menangle Bridge	Sampling Point - Menangle Bridge (Urban Plunge Program)	Campbelltown	5734-240403-1	108	0.025	0	0	0	0	0	0	284.3	58120	0.234	56830	0
L24035343	ZCCC	12/04/2024 8:30	303713	ZCCC_W					5734-240412-4	2.19	0	0	0	0	0	0	0	985.5	2740	1.46	1160	0
L24036358	ZCCC	16/04/2024 8:30	303834	ZCCC_W					5734-240416-1	14.9	0.004	0	0	0	0	0	0	348.9	7660	0.445	6420	0
L24037881	ZCCC	22/04/2024 8:30	304374	ZCCC_W					5734-240422-2	6.41	0.005	0	0	0	0	0	0	263.8	4010	0.226	1630	0
L24039641	ZCCC	29/04/2024 8:30	304672	ZCCC_W					5734-240429-1	4.78	0.001	0	0	0	0	0	0	134.3	3280	0.348	2520	0

Menangle Bridge Water Quality Results (2022-2024 (Physical Data)

Site	Month	Date	Event Type	Conductivity (µS/cm)	pH (in situ)	Water Temperature (°C)	Dissolved Oxygen (% sat)	Turbidity (NTU)	Surface Films (Yes / No)
Menangle Bridge	November	29/11/2022	Monthly	107	8	22.5	91.2	5.69	No
Menangle Bridge	December	7/12/2022	Weekly	70.5	8.33	24.8	87.3	4.88	No
Menangle Bridge	December	13/12/2022	Weekly	112	8.12	24.1	89.3	3.87	No
Menangle Bridge	December	20/12/2022	Monthly	98.3	7.19	21.7	64.4	3.46	No
Menangle Bridge	December	28/12/2022	Weekly	129	7.9	25.6	74	1.06	No
Menangle Bridge	January	3/01/2023	Weekly	139	7.34	25.6	84.7	3.79	No
Menangle Bridge	January	10/01/2023	Weekly	184	8.02	25	90.1	2.18	No
Menangle Bridge	January	17/01/2023	Weekly	199.3	7.56	26.9	88.1	2.35	No
Menangle Bridge	January	24/01/2023	Weekly	216.4	7.7	24.1	83	2.24	No
Menangle Bridge	January	31/01/2023	Monthly	267	7.5	24.5	89.4	15.58	No
Menangle Bridge	February	07/20/2023	Weekly	257	7.48	23.4	86.9	2	No
Menangle Bridge	February	14/02/2023	Weekly	237	7.41	24.7	68.3	4.87	No
Menangle Bridge	February	21/02/2023	Weekly	304	7.81	28	70.4	2.68	No
Menangle Bridge	February	28/02/2023	Monthly	225	7.9	24.7	97.7	12.85	No
Menangle Bridge	March	7/03/2023	Weekly	241	7.79	24.4	76.1	5.2	No
Menangle Bridge	March	14/03/2023	Weekly	225	7.47	23.9	97.5	2.86	No
Menangle Bridge	March	21/03/2023	Monthly	213	7.86	23.5	92.1	2.45	No
Menangle Bridge	March	28/03/2023	Weekly	238	7.85	21.2	94.3	2.41	No
Menangle Bridge	April	4/04/2023	Weekly	248	7.89	20.9	102.7	9.29	No
Menangle Bridge	April	11/04/2023	Weekly	123.7	8.01	19.5	98.5	6.28	No
Menangle Bridge	April	18/04/2023	Weekly	160.1	7.8	18.3	69.9	4.49	No
Menangle Bridge	April	24/04/2023	Monthly	174	7.81	18.1	76.9	2.59	No
Menangle Bridge	May	26/05/2023	Monthly	223	8.64	-	85.3	3.9	No
Menangle Bridge	June	23/06/2023	Monthly	181	8.88	-	83.3	2.4	No
Menangle Bridge	July	18/07/2023	Monthly	179	7.8	-	86.1	1.45	No
Menangle Bridge	July	18/07/2023	Monthly	179	7.8	-	86.1	1.45	No
Menangle Bridge	August	25/08/2023	Monthly	267	7.91	10.8	86.5	2.09	No
Menangle Bridge	September	29/09/2023	Monthly	352	7.89	20.9	74.9	3.8	No
Menangle Bridge	October	30/10/2023	Monthly	357	7.52	21.4	79.7	1.95	No
Menangle Bridge	October	8/11/2023	WW Day #1	267	7.74	21.4	46.9	3.51	No
Menangle Bridge	November	9/11/2023	WW 10 day #2	213.6	7.3	24.4	49.8	3.34	No
Menangle Bridge	November	10/11/2023	WW 10 day #3	265	7.61	21.1	62.6	1.41	No
Menangle Bridge	November	11/11/2023	WW 10 day #4	270	7.35	22.4	50	2.22	No

Menangle Bridge Water Quality Results (2022-2024 (Physical Data)

Site	Month	Date	Event Type	Conductivity (µS/cm)	pH (in situ)	Water Temperature (°C)	Dissolved Oxygen (% sat)	Turbidity (NTU)	Surface Films (Yes / No)
Menangle Bridge	November	11/12/2023	WW 10 day #5	291	6.79	26	32.8	3.94	No
Menangle Bridge	November	11/13/2023	WW 10 day #6	258	7.48	24	70.6	0.14	No
Menangle Bridge	November	11/14/2023	WW 10 day #7	235	7.58	25	78.1	1.46	No
Menangle Bridge	November	11/15/2023	WW 10 day #8	334	7.81	24	68.1	5.04	No
Menangle Bridge	November	11/16/2023	WW 10 day #9	205.7	7.6	24.6	61.5	0.54	No
Menangle Bridge	November	11/17/2023	WW 10 day #10	203.6	7.39	24.4	69.5	0.59	No
Menangle Bridge	November	11/20/2023	Monthly	237	6.71	24.2	64.2	3	No
Menangle Bridge	December	12/01/2023	Monthly	251	6.62	20.6	29.1	-	No
Menangle Bridge	December	12/04/2023	Weekly	149.1	6.66	23	43.5	-	No
Menangle Bridge	December	12/12/2023	Weekly	116.9	7.85	27.4	70.5	7.46	No
Menangle Bridge	December	12/18/2023	Weekly	126.5	7.13	26.9	67.1	0	No
Menangle Bridge	December	12/27/2023	Weekly	204.4	6.86	23	28.5	0.35	No
Menangle Bridge	January	1/02/2024	Weekly	134	6.76	24.7	39.1	6.8	No
Menangle Bridge	January	1/12/2024	Weekly	128	7.02	27	75	1.78	No
Menangle Bridge	January	1/15/2024	Monthly	145.1	6.86	24.9	78.8	1.3	No
Menangle Bridge	January	1/22/2024	Weekly	169	7.08	25.2	56.9	3.77	No
Menangle Bridge	January	1/29/2024	Weekly	135.6	7.09	26.2	260	2	No
Menangle Bridge	February	2/05/2024	Weekly	111.3	7.4	27.7	93.7	1	No
Menangle Bridge	February	2/09/2024	WW 10 Day #1	128.1	7.12	24	76.5	4.9	No
Menangle Bridge	February	2/10/2024	WW 10 Day #2	226	6.82	23.8	33.6	8.7	No
Menangle Bridge	February	2/11/2024	WW 10 Day #3	232	6.55	25.1	36.2	10.4	No
Menangle Bridge	February	2/12/2024	Weekly / WW 10 Day #4	116	6.99	25	76.5	7.4	No
Menangle Bridge	February	2/13/2024	Monthly / WW 10 Day #5	129	70.6	24.6	77.9	6.1	No
Menangle Bridge	February	2/14/2024	WW 10 Day #6	159.2	7.16	25.2	75.8	12.02	No
Menangle Bridge	February	2/15/2024	WW 10 Day #7	168.3	7.66	24	74.3	5.39	No
Menangle Bridge	February	2/16/2024	WW 10 Day #8	215	6.94	23.1	38	23.14	No
Menangle Bridge	February	2/17/2024	WW 10 Day #9	13.2	6.95	23.9	42.2	11.7	No
Menangle Bridge	February	2/18/2024	WW 10 Day #10	409	6.83	28.5	43.4	12.12	No
Menangle Bridge	February	2/20/2024	Weekly	154.8	7.19	24.4	OVR	4.68	No
Menangle Bridge	February	2/26/2024	Weekly	169	7.41	24.8	-71.1	9.63	No

Menangle Bridge Water Quality Results (2022-2024 (Physical Data)

Site	Month	Date	Event Type	Conductivity (µS/cm)	pH (in situ)	Water Temperature (°C)	Dissolved Oxygen (% sat)	Turbidity (NTU)	Surface Films (Yes / No)
Menangle Bridge	March	3/04/2024	Weekly	175	7.51	25.5	85	13.37	No
Menangle Bridge	March	3/11/2024	Monthly / Weekly	198.8	7.24	25	Probe malfunction	4.25	No
Menangle Bridge	March	3/18/2024	Weekly	202.8	7.41	25.3	Probe malfunction	8.67	No
Menangle Bridge	March	3/26/2024	Weekly	182.9	7.6	25.4	Probe malfunction	10.48	No
Menangle Bridge	April	4/10/2024	Wet Weather 3 Day #1	146.5	6.95	19.8	70.1	20.46	No
Menangle Bridge	April	4/11/2024	Wet Weather 3 Day #2	108.1	6.98	18.8	64.4	18.18	No
Menangle Bridge	April	4/12/2024	Wet Weather 3 Day #3/Weekly	137.2	7.05	19.6	64.3	18.7	No
Menangle Bridge	April	4/16/2024	Weekly	92.8	7.12	19.5	81	20.5	No
Menangle Bridge	April	4/22/2024	Monthly / Weekly	114.3	7.37	18.1	74.9	22.08	No
Menangle Bridge	April	4/29/2024	Weekly	97.8	7.1	21.5	79	10.63	No
Menangle Bridge	May	5/09/2024	WW 3 Day #1	80.9	6.91	16.9	82.8	3.66	No
Menangle Bridge	May	5/10/2024	Monthly / WW 3 Day #2	98.3	6.79	16.9	80.3	10.21	No
Menangle Bridge	May	5/11/2024	WW 3 Day #3	101	7.12	16.9	87.1	4.3	No
Menangle Bridge	June	6/05/2024	WW Day #1	145.5	7.11	13.2	103.1	10.47	No
Menangle Bridge	June	6/06/2024	WW Day #2	103.2	7.13	13.5	116.3	4.17	No
Menangle Bridge	June	----	----	----	----	----	----	----	No access - flooding
Menangle Bridge	June	24/06/2024	Monthly	125.3	6.85	11.1	102.4	26.94	No
Menangle Bridge	July	11/07/2024	Monthly	109	6.5	11.9	91.1	8.54	Foam
Menangle Bridge	August	1/08/2024	Monthly	96	7.09	10.6	116.6	4.56	No
Menangle Bridge	September	10/09/2024	Monthly	116	7.82	16.2	133	3.01	No

Menangle Bridge Water Quality Results 2022 - 2024 (Pathogens)

Sample ID	Client	Date Sampled	Report No	Test List	Sampling Point	Sp Address	Sp Desc	Sp Location	Project No	E.coli	Faecal Coliform	Enterococci	Bacteroides HF183 (batch of 3-6)	Sample Volume	crAssphage CPQ_056	Filtration and extraction (batch 3- 6)	Ruminant EURL_AP (batch 3-6)
										MI01/1	MI01/1	MI03AS/1	MV37/1	MV37/1	MV37/1	GL03/1	GL03/1
										CFU/100mL	CFU/100mL	CFU/100mL	Gene Copies/L	mL	Gene Copies/L	Gene Copies/ml	Gene Copies/ml
L24015442	ZCCC	9/02/2024 7:30	299193	ZCCC_AH					5734-240209-1	~110	~110	38	Detected	1000	Not Detected		
L24015446	ZCCC	10/02/2024 7:30	299187	ZCCC_AH					5734-240212-1	47	57	32	Detected	1000	Not Detected		
L24015450	ZCCC	11/02/2024 17:30	299522	ZCCC_AH					5734-240212-3	~44	~44	~11	Detected	1000	Not Detected		
L24015454	ZCCC	12/02/2024 7:30	299520	ZCCC_AH					5734-240212-4	~100	~150	58	Not Detected	1000	Not Detected		
L24015458	ZCCC	13/02/2024 7:00	299446	ZCCC_AH					5734-240213-5	52	52	30	Detected	1000	Not Detected		
L24015462	ZCCC	14/02/2024 7:30	299693	ZCCC_AH					5734-240214-1	16	32	23	1500	1000	Not Detected		
L24015466	ZCCC	15/02/2024 7:30	299645	ZCCC_AH					5734-240215-1	~31	~31	31	2000	1000	Not Detected		
L24015470	ZCCC	16/02/2024 7:30	299646	ZCCC_AH					5734-240216-1	~14	~50	27	Detected	1000	Not Detected		
L24015474	ZCCC	17/02/2024 6:30	299719	ZCCC_AH					5734-240219-1	~36	~36	30	Not Detected	1000	Not Detected		
L24015478	ZCCC	18/02/2024 18:00	300319	ZCCC_AH					5734-240220-1	~30	~30	27	Detected	1000	Not Detected		
L24034328	ZCCC	10/04/2024 9:30	303867	ZCCC_AH	ZCCC_MB	Menangle Bridge	Sampling Point - Menangle Bridge (Urban Plunge Program)	Campbellt own	5734-240411-1	~1200	~1400	340					
L24034333	ZCCC	11/04/2024 9:30	303844	ZCCC_AH	ZCCC_MB	Menangle Bridge	Sampling Point - Menangle Bridge (Urban Plunge Program)	Campbellt own	5734-240412-1	250	250	12					
L24034338	ZCCC	12/04/2024 8:30	303845	ZCCC_AH	ZCCC_MB	Menangle Bridge	Sampling Point - Menangle Bridge (Urban Plunge Program)	Campbellt own	5734-240412-3	~450	~450	29					
L24042651	ZCCC	10/05/2024 7:30	304957	ZCCC_AH	ZCCC_MB	Menangle Bridge	Sampling Point - Menangle Bridge (Urban Plunge Program)	Campbellt own	5734-240510-1	~1300	~1300	2600	6000	700	13000		
L24042639	ZCCC	9/05/2024 7:30	304942	ZCCC_AH					5734-240509-1	340	510	800	900	1000	3000		
L24042655	ZCCC	11/05/2024 6:30	304958	ZCCC_AH	ZCCC_MB	Menangle Bridge	Sampling Point - Menangle Bridge (Urban Plunge Program)	Campbellt own	5734-240510-2	440	440	540	7100	700	20000		
L24050349	ZCCC	5/06/2024 9:30	306703	ZCCC_AH	ZCCC_MB	Menangle Bridge	Sampling Point - Menangle Bridge (Urban Plunge Program)	Campbellt own	5734-240605-1	4	12	23	Detected	1000	Detected	Done	900
L24050364	ZCCC	6/06/2024 9:30	306707	ZCCC_AH	ZCCC_MB	Menangle Bridge	Sampling Point - Menangle Bridge (Urban Plunge Program)	Campbellt own	5734-240606-1	~150	~150	210	1000	1000	Detected	Done	4800

iswane@bigpond.com

From: Katrina O'Reilly <Katrina.OReilly@planning.nsw.gov.au>
Sent: Wednesday, 23 October 2024 7:49 AM
To: iswane@bigpond.com
Cc: Carl Dumpleton
Subject: Independent Environmental Audit for Benedict Menangle Sand Quarry

Good morning Ian,
I refer to the email you send to Carl in regards to the above audit. NSW Planning would like the below agencies to be consulted:

BCD
Local Aboriginal Land Councils
Wollondilly Shire Council
Water Group within the Department
EPA
Heritage NSW
Mining, Exploration and Geoscience within Regional NSW
TfNSW

Areas to be focused on to include:
Compliance with approved all extraction boundaries, stages, areas, depths and limits.
Compliance with all commitments, reporting and monitoring requirements within management plans.
Management, monitoring and responses of complaints register.
Compliance with conditions relating to rehabilitation and riparian management.

Regards
Katrina

iswane@bigpond.com

From: Matt Davidson <Matthew.Davidson@epa.nsw.gov.au>
Sent: Monday, 21 October 2024 9:54 AM
To: iswane@bigpond.com
Subject: RE: Independent Environmental Audit for Benedict Menangle Sand Quarry (EPL 3991)

Hi Ian,

I refer to your email to the EPA regarding the upcoming Independent Environmental Audit (IEA) on the Conditions of Approval of Consolidated Consent 85/2865 (Consent) issued to Menangle Sand & Soil Pty Ltd (MSS) for the sand quarry at 31 Menangle Road, Menangle (Premises) being conducted by Ian Swane & Associates (ISA). MSS hold Environment Protection Licence No. 3991 (Licence) for activities at the Premises.

ISA have advised the EPA that the primary scope of the audit includes an assessment of each relevant condition relating to quarrying by MSS in the Stage 8 area of the Premises from 9 August 2023 to 8 August 2024, including Licence conditions relevant to the Consent.

On 1 July 2024, the EPA varied the Licence to include additional noise monitoring requirements relating to Stage 8 in line with the Consent.

At this time, the EPA does not have any major concern with operations at the Premises, however, the following areas could be reviewed:

- Receipt and processing/use of waste streams;
- Air quality impacts, particularly management and monitoring of dust generation; and
- Compliance with noise limits and monitoring requirements

Thank you for your enquiry and if you have any questions, please give me a call.

Matt Davidson
Operations
NSW Environment Protection Authority
D 02 4224 4104 | **M** 0439 816 542

www.epa.nsw.gov.au @NSW_EPA

The EPA acknowledges the traditional custodians of the land and waters where we work. As part of the world's oldest surviving culture, we pay our respect to Aboriginal elders past, present and emerging

Report pollution and environmental incidents 131 555 or +61 2 9995 5555

---------- Forwarded Message ----------
From: [iswane@bigpond.com]
Sent: 04/10/2024 08:23
To: info@epa.nsw.gov.au
Subject: Independent Environmental Audit for Benedict Menangle Sand Quarry (EPL 3991)

Attention: The Appropriate EPA Officer

Dear EPA,

I have been approved by the Department of Planning, Housing and Infrastructure (**DPHI**) to undertake an independent environmental audit (**IEA**) for the Benedict Menangle Sand Quarry located at 31 Menangle Road, Menangle NSW 2568 (the **Facility**). The audit is being undertaken to comply with Conditions D11 and D12 of a Consolidated Consent numbered 85/2865 issued by the DPHI in November 2021 (the **Consent**). The audit covers the first year of quarrying by Benedict in the Stage 8 area and covers the period 9 August 2023 to 8 August 2024.

The requirements of the Consent considered relevant to this IEA cover:

1. Administrative conditions (Consent Part A);
2. Specific environmental conditions (Consent Part B);
3. Additional procedures (Consent Part C); and
4. Environmental management, reporting and auditing (Consent Part D).

The requirements of Environment Protection Licence (**EPL**) number 3991 considered relevant to this IEA cover:

1. Administrative conditions (EPL Part 1);
2. Limit conditions (EPL Part 2);
3. Operating conditions (EPL Part 3);
4. Monitoring and recording conditions (EPL Part 4); and
5. Reporting conditions (EPL Part 5).

The **NSW EPA** is invited to provide me with comments / requirements or specific environmental issues the **NSW EPA** requires the audit to target. Feedback would most conveniently be via email. In the interim, please don't hesitate to contact me by email or mobile should you require any further information regarding the audit.

Many thanks

Ian

Dr Ian C Swane (CPEng, CEnvP)

EPA Site Auditor

Ian Swane & Associates (mob: 0418 867 112)

iswane@bigpond.com

From: Info <Info@fire.nsw.gov.au>
Sent: Friday, 4 October 2024 8:39 AM
To: iswane@bigpond.com
Subject: Automatic reply: Independent Environmental Audit for Benedict Menangle Sand Quarry (EPL 3991)

Thankyou for contacting Fire and Rescue NSW. If you wish to report an emergency please phone '000'.

This is a general enquiries email address and is not monitored 24 hours a day, however we will endeavour to respond to your email as soon as possible, and within 14 days.

For Fire safety information please visit www.fire.nsw.gov.au

To contact your local Fire and Rescue NSW Fire Station please visit www.fire.nsw.gov.au and click on the 'Contact Us' tab.

---

iswane@bigpond.com

From: Muriel Maher <Muriel.Maher@transport.nsw.gov.au>
Sent: Tuesday, 15 October 2024 2:56 PM
To: iswane@bigpond.com
Cc: Development Sydney
Subject: TfNSW RE: SYD24-01711 - IEA Benedict Menangle Sand Quarry (EPL 3991)

Good afternoon Ian,

Thank you for your time via phone a short time ago in addition to providing TfNSW the opportunity to provide comment relevant to the Benedict Menangle Sand Quarry Independent Environmental Audit.

Please note TfNSW has not identified any issues.

Any further queries, please do not hesitate to extend to development.sydney@transport.nsw.gov.au as cc'd.

Best regards,

Muriel Maher
Senior Coordinator Land Use | West & Central
Transport Planning
Planning, Integration and Passenger
Transport for NSW

M: 0492 366 862

231 Elizabeth Street
Sydney NSW 2000

Transport for NSW

I acknowledge the Traditional Custodians of country throughout Australia and their connections to land, sea and community.
I pay my respect to their Elders past and present, and extend that respect to all Aboriginal and Torres Strait Islander peoples.

Please note I work flexibly. Unless it suits you, I do not expect you to read or respond to my emails outside of your normal work hours.

From: iswane@bigpond.com <iswane@bigpond.com>
Sent: Friday, October 4, 2024 8:36 AM
To: Andrew Lissenden <andrew.lissenden@transport.nsw.gov.au>
Subject: Independent Environmental Audit for Benedict Menangle Sand Quarry (EPL 3991)

Attention: Andrew Lissenden, Transport for NSW (TfNSW) Environmental Compliance Officer

Dear Andrew,

I have been approved by the Department of Planning, Housing and Infrastructure (**DPHI**) to undertake an independent environmental audit (**IEA**) for the Benedict Menangle Sand Quarry located at 31 Menangle Road, Menangle NSW 2568 (the **Facility**). The audit is being undertaken to comply with Conditions D11 and D12 of a Consolidated Consent numbered 85/2865 issued by the DPHI in November 2021 (the **Consent**). The audit covers the first year of quarrying by Benedict in the Stage 8 area and covers the period 9 August 2023 to 8 August 2024.

The requirements of the Consent considered relevant to this IEA cover:

- Administrative conditions (Consent Part A);
- Specific environmental conditions (Consent Part B);
- Additional procedures (Consent Part C); and
- Environmental management, reporting and auditing (Consent Part D).

The requirements of Environment Protection Licence (**EPL**) number 3991 considered relevant to this IEA cover:

- Administrative conditions (EPL Part 1);
- Limit conditions (EPL Part 2);
- Operating conditions (EPL Part 3);
- Monitoring and recording conditions (EPL Part 4); and
- Reporting conditions (EPL Part 5).

TfNSW is invited to provide me with comments / requirements or specific environmental issues **TfNSW** requires the audit to target. Feedback would most conveniently be via email. In the interim, please don't hesitate to contact me by email or mobile should you require any further information regarding the audit.

Many thanks
Ian

Dr Ian C Swane (CPEng, CEnvP)
EPA Site Auditor
Ian Swane & Associates (mob: 0418 867 112)

Appendix D. Audit Team Specialists Report

Level 3 175 Scott Street
Newcastle NSW 2300
ABN: 28 141 736 558

02 4907 4800

www.emmconsulting.com.au

Memorandum

13 March 2025

To: Dr Ian Swane
EPA Site Auditor
Ian Swane and Associates

From: Jonathon Tait, Philippa Fagan and Lachlan Hammersley

Subject: Menangle Quarry Independent Environmental Audit: Technical Expert Review

Dear Ian,

Menangle Sand & Soil Pty Ltd (MSS), a subsidiary of Benedict Recycling Pty Limited**,** is the operator of the Menangle Quarry located at 31 Menangle Road, Menangle NSW 2568. Condition D11 of the Mod 2 Consent required an independent environmental audit (IEA) of the Stage 8 extraction work to be undertaken within one year of the commencement of quarrying operations in the Stage 8 area.

Ian Swane and Associates, the lead auditor, has engaged EMM Consulting Pty Ltd (EMM) to conduct an expert review of the audit findings in the fields of Groundwater, Surface Water and Biodiversity. This letter therefore documents this review, associated with Stage 8 of the Menangle Quarry covering the period 9 August 2023 to 8 August 2024 (the Audit Period) and satisfy the requirements of Conditions D11 and D12 of the Mod 2 Consent.

In a letter dated 20 August 2024 the NSW Department of Planning, Housing and Infrastructure (DPHI) approved the following members of the independent audit expert team from EMM to be:

- Jonathon Tait, Associate Hydrogeologist specialising in mining and extractive industries, including drilling supervision, contractor management, hydraulic testing, pumping testing, groundwater sampling, hydrogeological conceptualisation, impact assessments and compliance reporting. He has not previously worked for MSS.

- Lachlan Hammersley, Associate Water Resources Engineer who is experienced in a wide range of project types including drainage design, water management for linear infrastructure, specialist studies in EIS preparation, water-in-mining and industrial water management projects. Lachlan has overseen water management and water infrastructure for mining operations around Lake Macquarie and Lithgow. Lachlan recently updated the Menangle Quarry Soil and Water Management Plan. He has not worked for MSS prior to this.

- Philippa Fagan, Associate Ecologist specialising in terrestrial vegetation survey and assessment and bird surveys and impact assessment. She is an accredited Biodiversity Assessment Method (BAM) Assessor. Philippa has delivered projects across a range of sectors, including mining and extractive, infrastructure, and residential and commercial development. She has not previously worked for MSS.

1.1 Assumptions and Limitations

None of the aforementioned EMM staff have visited the site as part of their technical review of this IEA. EMM is operating under the assumption that Ian Swane is a suitably qualified, experienced and independent auditor, who has conducted the audit in accordance with best practice and remained impartial. EMM is relying on the information provided by Ian Swane to conduct their review, under the assumption that the lead auditor inspected all necessary aspects of the site pertaining to the audit and has reported on these aspects in a truthful manner. EMM's role is limited to a technical review of the relevant sections of the Independent Audit Report (Ian Swane and Associates 2025).

EMM's expert technical review is summarised in the following sub-sections.

1.2 Groundwater

The expert technical review for groundwater pertains to Sections 3.4.4 and 4.10 and Appendix E of the Independent Audit Report (Ian Swane and Associates 2025).

The MOD 2 Consent requires:

1. Monitoring of monitoring bores BH01_S, BH01_D, BH02, BH03 and BH04 with continuous loggers and the integrity of these bores must not be compromised by quarrying (Conditions B19 and B20)

2. Water quality sampling must be completed once yearly (Condition B21). pH in alluvium and sandstone bores is acidic possibly indicating groundwater exchange from the sandstone to the alluvium.

3. Temporary bores are drilled progressively at each substage to determine the local water table depth prior to excavation and the excavation depth remains one metre above the water table (Condition B22).

4. MSS must ensure they have an adequate water access licence if they are taking groundwater (B23).

5. If groundwater take exceeds 3 megalitres per year (ML/yr), the quarry needs to obtain the necessary Water Access Licenses (Condition B27).

6. Any groundwater take must be recorded and detailed in the Annual review (Condition B30).

7. Groundwater management plan needs to be implemented (Condition B36c (iii)).

Conditions B24, B25 and B26 were addressed by EMM (2021). Conditions B28 and B29 are not relevant to groundwater given the available information.

EMM's response to each of the above is as follows:

1. Monitoring bores remain functional, and level loggers are downloaded on a quarterly basis to ensure ongoing data capture.

2. Monitoring bores BH01_S, BH01_D, BH02, BH03 and BH04 have been sampled for water quality on a yearly frequency.

3. BH01_S and BH01_D have been used to monitoring groundwater levels prior to the excavation of Stage 8A. There is no evidence of temporary monitoring bores installed for Stage 8B and Stage 8C. No information was provided on excavation depth to ensure that the excavation depth remained 1 m above the water table.

4. Groundwater take is modelled to be less than 0.7 ML/yr which is exempt from requiring a water access license.

5. Photo evidence was provided for flooding events on the 8 April 2024 and 8 June 2024. Photos were taken of rehabilitated areas at Stage 8A and Stage 8B. No photos were provided of the extraction area at Stage C. It is assumed the excavations Stage C was fully inundated by the Nepean River. Any water in the excavations post flooding is assumed to be surface water and no indirect groundwater take occurred.

6. No evidence or record of groundwater take detailed in the audit report or provided to EMM. MSS confirms no groundwater was taken during the operations to date within Stage 8.

7. The groundwater management plan has been implemented accordingly.

EMM's Associate Hydrogeologist Jonathon Tait has reviewed the documentation provided by Ian Swane and Associates, including site photographs, as well as additional documentation including the Soil and Water Management Plan (EMM 2024).

It is believed that Condition B22 has not been satisfied and MSS is **non-compliant.** Temporary bores should be drilled in the next substage to assess whether this condition is necessary because the operational risk to groundwater is considered low.

All other conditions associated with groundwater are considered compliant. However, given the scrutiny of groundwater take, additional effort should be made to capture evidence to support that MSS is compliant with Condition B27 and B30.

1.3 Surface Water

The expert technical review for surface water pertains to Sections 3.4.3, 3.4.5, 3.4.6, 3.4.7, 4.4, 4.7, 4.10 and Appendix E of the Independent Audit Report (Ian Swane and Associates 2025).

The MOD 2 consent requires:

- A soil and water management plan (SWMP) be prepared that included a surface water management plan approved by DPHI (Conditions B36 to B39).

- Suitable erosion and sediment control measures needed to be installed and maintained in the Stage 8 Area (Condition B31).

- Flood Management Plan be prepared and approved by DPHI (Condition B32) with the procedures to be implemented (Conditions B33 to B35).

- An Ephemeral Creek Management Plan (ECMP) be prepared and approved by DPHI (Condition B40) with the procedures to be implemented (Conditions B41 and 42).

EMM's response to each of the above is as follows:

- The review of existing management plans for the site by EMM has considered these to be adequate and it is noted that there was no specific surface water related items identified in consultation undertaken with regulatory agencies from the audit.

- On review of erosion and sediment controls, it was noted that based on the site observations by the lead auditor, that there are recommendations to undertake remediation in areas of the escarpment where erosion was observed. Sedimentation controls and erosion stabilisation should be undertaken in accordance with those recommended within the current SWMP and/or Landcom (2004). Evidence of drainage, erosion and sediment control inspections has been documented within the 2023 Annual Review (Benedict 2024) and the attached *Site Rehabilitation and Restoration Annual Progress Report* (Benedict 2023) however, more recent evidence was not available for review. The evidence reviewed indicated that

there was an acceptable process for ongoing inspections and management activities occurring on site during the audit period.

- The site has registered two flood events during the audit period. The lead auditor has indicated that these flood events deposited silt into the project area. Management of this silt material is not necessarily required in inactive areas due to its deposition occurring under natural processes. However, when these areas become active, then mobilisation of deposited silt material should be mitigated through using control strategies provided within the current SWMP and/or Landcom (2004).

- The site undertake water quality monitoring within the Nepean River at a number of locations. Historical water quality data on the Nepean River collected by MSS was not reviewed by EMM as part of the audit. The lead auditor has indicated that water quality data has also been collected by Campbelltown Council. Monitoring locations downstream of the site collected by the Council have indicated elevated microbial, faecal and nutrient levels. The lead auditor concluded the source of this poor water quality is not associated with activities of the site. Regardless, based on the potential water quality risks of the site identified through the observations made by the lead auditor, there was the potential for the site to be a source of elevated nutrients. EMM support the recommendations made by the lead auditor for the site to implement additional water management strategies to mitigate potential impacts from material handling activities (compost and cow manure) from the site on the Nepean River.

- In regard to water supply and licensing matters, as per the 2023 Annual Review (Benedict 2023), the site operations extract water from the Nepean River via work approval 10WA104627 and Water Access Licence (WAL) 26377. The nominated WAL is located within the Mid Nepean River Weirs Water Source, Wallacia Weir Management Zone, and entitles the site access to 26 units of water(where 1 unit is typically equal to 1 ML). It is noted that this WAL is different to what documented as the primary water supply for the project within the SWMP. It is recommended that the SWMP is updated to confirm the point of water supply for the project.

- It is understood that the meter on the pumps (associated with 10WA104627) extracting water from the river remains out of service and a manual log book has been, and continues to be, used to record surface water take on the site. Log book information has been provided within the 2023 Annual Review however reporting on actual water take is not clear and has not been explained provided in the 2023 Annual Review. This has been identified also by the lead auditor as a recommendation with a low risk. It is recommended that further detail is provided on water supply and licensing matters in future annual reviews, including potential groundwater take and surface water interception volumes alongside the completion of the annual water balance. From data provided in the 2023 Annual Review, surface water extraction volumes from the Nepean River are understood to be approximately 0.6 to 1.0 ML/month and likely to be within the nominated WAL26377 volume of 26 units.

- The water balance is required to be progressively updated. Monitoring commenced in March 2024 for water use with a minimum required data set of 12 months. It is expected that the first annual water balance revision will occur as part of the 2024 Annual Review to be prepared in 2025.

- The lead auditor has reviewed the conditions of the CAA and has determined that the site operations are being operated in accordance with the approval based on site observations and review of the information provided by the site.

1.4 Biodiversity and Rehabilitation

The expert technical review for biodiversity and rehabilitation pertain to Sections 3.4.9 and 4.6 of the Independent Audit Report (Ian Swane and Associates 2025).

The MOD 2 Consent requires:

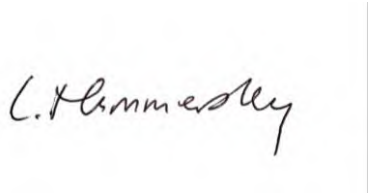
1. The construction of linear infrastructure to meet certain requirements (Conditions B65 & B66).
2. A biodiversity offset strategy (Conditions B67 – B69).
3. Specified rehabilitation objectives (Condition B70).
4. Specified requirements for progressive rehabilitation (Conditions B71 & B72).
5. Specified requirements for a BRMP (Condition B73).
6. The management procedures specified in the approved BRMP needed to be implemented (Conditions B74 – B78).

EMM's response to each of the above is as follows:

1. Assumed generally compliant in accordance with findings from Ian Swain.
2. Generally compliant as per conditions set out in B51 of consent.
3. Assumed generally compliant in accordance with findings (and review of documentation and photographs) from Ian Swain (those items achievable to date).
4. Generally compliant. Progressive rehabilitation underway and ongoing monitoring conducted by EMM. Available data includes that within Annual Reviews, ecological monitoring reports, nestbox installation and monitoring records, planting guidelines and plant species, and BRMP.
5. BRMP prepared by EMM 2024a and approved by DPHI.
6. Available data (EMM monitoring reports) indicates general compliance with approved BRMP (those items achievable to date). It is noted that 106 nestboxes were required to be installed 12 months from the commencement of Stage 8, however only 35 nestboxes were installed as of 24 October 2024. It is also noted that the findings of the 2024 BRMP floristic monitoring suggest that the recommended species list, being those pertaining to the River Flat Eucalypt Forest vegetation community, is not strictly being followed.

EMM's Associate Ecologist Philippa Fagan has reviewed the documentation provided by Ian Swane and Associates, including site photographs, as well as additional documentation including the *Biodiversity and Rehabilitation Management Plan for Menangle Sand and Soil Quarry* (EMM 2024a) and the *Site Rehabilitation and Restoration Annual Progress Report* (Benedict 2023). She is satisfied that the conditions for Biodiversity and Rehabilitation have generally been met for this audit reporting period.

Yours sincerely



Jonathon Tait
Associate Hydrogeologist
jtait@emmconsulting.com.au

Philippa Fagan
Associate Ecologist
pfagan@emmconsulting.com.au

Lachlan Hammersley
Associate Water Resources Engineer
lhammersley@emmconsulting.com.au

References

Benedict 2023. *Site Rehabilitation and Restoration Annual Progress Report.* Benedict Industries Pty Ltd, Appendix C of 2023 Annual Review.

Benedict 2024. *MENANGLE SAND AND SOIL, ANNUAL REVIEW (Condition D9) Benedict Sands Menangle (LEC 2018/342158) 01 January 2023 - 31 December 2023,* Benedict Industries Pty Ltd.

EMM 2021. *Groundwater monitoring and modelling update – July 2021,* memorandum from EMM Consulting Pty Limited to Benedict Industries Pty Limited, dated 23 September 2021.

EMM 2024a. *Biodiversity and Rehabilitation Management Plan for Menangle Sand and Soil Quarry.* EMM Consulting, Prepared for Menangle Sand and Soil Pty Limited.

EMM 2024b. *Soil and Water Management Plan, Menangle Sand and Soil Quarry,* Version 5. EMM Consulting, Prepared for Menangle Sand and Soil Pty Limited.

Ian Swane and Associates. 2025. *Benedict Menangle Sand and Soil Quarry: Independent Audit Report*. Prepared by Ian Swane and Associates in March 2025.

Landcom 2004. *Managing Urban Stormwater, Soils and Construction, Volume 1*, NSW Government

Appendix E. Independent Audit Compliance Tables

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
PART A: ADMINISTRATIVE CONDITIONS				
	APPLICATION OF THIS SCHEDULE			
A1	The conditions in this Schedule have no effect until the Applicant provides notification of the commencement of construction activities associated with Stage 8 Operations, as required under condition A5(a) of this Schedule.	Refer Condition A5	None required	--
A2	The conditions in this Schedule do not apply retrospective requirements in relation to Quarrying Operations undertaken in Stages 1 to 7 of the development that have been completed prior to 31 December 2020	Noted	None required	--
A3	From the commencement date of construction activities associated with Stage 8 Operations, as notified under condition A5(a) of this Schedule, the obligations in Schedule 1 of this development consent will continue to apply in relation to Stages 1 to 7 of the development, except in so far as they are specifically amended by the conditions of this Schedule.	Noted	None required	--
A4	In the event of an inconsistency, ambiguity or conflict between the conditions in Schedules 1 and 2 of this development consent, as they relate to the Stage 8 Operations, the conditions in Schedule 2 prevail to the extent of the inconsistency, ambiguity or conflict.	Noted	None required	--
	NOTIFICATION OF COMMENCEMENT (STAGE 8)			
A5(a)	The Applicant must notify the Department in writing of the date of commencement of any of the following phases of the development, at least two weeks before that date: (a) construction activities associated with Stage 8 Operations;	Letter notifying DPE of commencement of Stage 8 work issued 20/12/22 and works commenced 16/01/23. Copy of letter provided by Benedict	None required	--
A5(b)	(b) Quarrying Operations in each of Phases 1 to 7;	Benedict 2023 Annual Review (Sectn 1.1 & Appn A) advised construction notification 20/12/22, work commenced 16/01/23, operations commencement notification 9/8/2023; Stage 8 quarrying operations commenced 4/09/23, extraction in substage 8A commenced 4/9/2023, Phase 2 (substage 8C) commencement notification 15/3/2024.	None required	--
A5(c)	(c) cessation of Quarrying Operations (i.e. quarry closure); and	Not triggered	None required	--
A5(d)	(d) any period of suspension of Quarrying Operations (i.e. care and maintenance).	Not triggered	None required	--
	OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT			
A6	In addition to meeting the specific performance measures and criteria in this consent, all reasonable and feasible measures must be implemented to prevent, and if prevention is not reasonable and feasible, minimise, any material harm to the environment that may result from the operation of the development, and any rehabilitation required under this consent.	Refer observations made below	Refer recommendations below	--

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
	TERMS OF CONSENT			
A7(a)	The development (as modified) may only be carried out: (a) in compliance with the conditions of this consent;	Refer observations made below	Refer recommendations below	--
A7(b)	(b) in accordance with the directions of the Planning Secretary; and	Refer observations made below	Refer recommendations below	--
A7(c)	(c) generally in accordance with the EIS, EA (Mod 1), Amended Project Summary and the Development Layout and Modification Report.	Refer observations made below	Refer recommendations below	--
A8	Consistent with the requirements in this consent, the Planning Secretary may make written directions to the Applicant in relation to: (a) the content of any strategy, study, system, plan, program, review, audit, notification, report or correspondence submitted under or otherwise made in relation to this consent, including those that are required to be, and have been, approved by the Planning Secretary; and (b) the implementation of any actions or measures contained in any such document referred to in condition A8(a) of Schedule 2.	The Benedict 2023 Annual Review Benedict did not record any written directions were issued by DPHI, who approved the report on 2/08/24. Benedict also advised that no written directions had been received from DPHI during the audit period.	None required	--
A9	The conditions of this consent and directions of the Secretary prevail to the extent of any inconsistency, ambiguity or conflict between them and a document/s listed in condition A7(c) of Schedule 2. In the event of an inconsistency, ambiguity or conflict between any of the documents listed in condition A7(c) of Schedule 2, the most recent document prevails to the extent of the inconsistency, ambiguity or conflict.	Noted	None required	--
	LIMITS OF CONSENT - Nepean River Buffer Zone			
A10(a)	The Applicant must establish and maintain a Nepean River Buffer Zone during Quarrying Operations in the Stage 8 Area. This buffer zone must: (a) include a minimum horizontal setback of 10 m extending landward from the 64 m AHD contour on the western side of the Nepean River;	Auditor observed buffer zone with >10m setback during site inspection (refer photos in Appendix F)	Maintain buffer zone	Negligible

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No.	Condition	Observation	Recommendation	Risk Level
A10(b)	(b) be informed by a native vegetation identification report, which must: (i) be prepared by a suitably qualified and experienced botanist or ecologist, whose appointment has been endorsed by the Planning Secretary; (ii) include detailed site surveys to identify the DBH of all native trees that occur within the 10 m horizontal setback from the 64 m AHD contour referred to in sub-paragraph (a); (iii) classify all native trees identified in subparagraph (b)(ii) with a DBH of greater than or equal to 0.1 m as Protected Trees and provide their GPS coordinates; (iv) include a map illustrating a 7.5 m setback (measured at the outside of the native tree trunk) around each of the identified Protected Trees; (v) the map required under subparagraph (iv) must overlay high-resolution ortho-photographs, with supporting digital terrain data files provided in spatial format for GIS and as high-resolution JPEG files; and	The BRMP (Section 1.15) advised that the vegetation identification report was combined with the BRMP and approved by the DPHI on 3/03/22.	None required	--
A10(c)	c) be amended to include the findings of the native vegetation identification report, such that it is widened to include areas where the Protected Tree setbacks extend beyond the minimum 10 m horizontal setback referred to in subparagraph (a).	The BRMP (Section 1.15) advised that the vegetation identification report was combined with the BRMP and approved by the DPHI on 3/03/22.	None required	--
A11	The Applicant must submit a copy of the native vegetation identification report and associated survey plans, GPS coordinates and data files required under condition A10(b) of Schedule 2 and associated final landform plans to the Planning Secretary for each of Phases 1 to 7 of the development prior to commencing any vegetation clearing or Quarrying Operations in the relevant phase.	The BRMP (Section 1.15) advised that the vegetation identification report was combined with the BRMP and approved by the DPHI on 3/03/22.	None required	--
A12	With the written agreement of the Planning Secretary, the Applicant may seek to reduce the minimum 7.5 m horizontal setback distance for Protected Trees to an appropriate distance recommended by a consulting arborist assessment. Any variation request must be supported by an expert report prepared by the consulting arborist and will be determined by the Planning Secretary on a case by case basis.	Not triggered	None required	--
A13	The Applicant must retain and manage the minimum Nepean River Buffer Zone in accordance with the commitments in the documents listed in condition A7(c) of Schedule 2 (as may be amended by the conditions of this consent).	Auditor observed buffer zone being maintained with >10m setback (refer photos in Appendix F)	Maintain buffer zone	Negligible
	LIMITS OF CONSENT - General Limits on Extraction and Processing			
A14	Prior to undertaking Quarrying Operations in Substage 8G, the Applicant must update the TUFLOW hydrodynamic model used to generate the flood sensitivity analysis in the Additional Flood Impact Sensitivity Assessment dated 17 December 2019, prepared by Advisian in the Amended Project Summary, to include the post extraction topography for Substages 8G-M, using hydraulic roughness Scenario B, and simulate the 1% AEP flood.	Not triggered - this Condition relates to activities prior to extraction and operations in Substage 8G. Benedict advised that the commencement of substage 8G is some years away.	None required	--

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
A15	Prior to undertaking Quarrying Operations in Substage 8G, the Applicant must provide the Planning Secretary with a copy of the model required under condition A14 and a plan depicting any areas identified as having a post extraction 1% AEP peak flow velocity of 4 metres/second or greater.	Not triggered - this Condition relates to activities prior to extraction and operations in Substage 8G. Benedict advised that the commencement of substage 8G is some years away.	None required	--
A16	The Applicant must not carry out construction works or Quarrying Operations or locate any ancillary infrastructure within the Exclusion Areas.	Auditor considers no breach has occurred to Exclusion Areas since operations have not extended into the Nepean River Buffer Zone (refer Condition A10(a))	Maintain buffer zone	Negligible
A17	The Applicant must not: (a) carry out Quarrying Operations or regrading; and/or (b) remove vegetation, except where necessary for Weed control, within the Nepean River Buffer Zone, without the prior written agreement of the Planning Secretary. The written agreement of the Planning Secretary may be provided in circumstances where those activities are necessary for environmental management purposes.	Auditor observed buffer zone being maintained with >10m setback (refer photos in Appendix F)	Maintain buffer zone	Negligible
A18	The Applicant must ensure that any weed control activities undertaken within the Nepean River Buffer Zone: (a) are limited to Weed removal techniques that use hand-held tools; and (b) minimise ground disturbance to the greatest extent practicable.	Benedict advised that weeding control activit-ies are planned around weather conditions & done when weather is favourable. Involves spraying, slashing, use of manual tools & hand pulling weeds. Auditor inspected site & observed weeding controls were being applied as per BRMP (Section 5.5). MSS provided copy of weeding log (Ref [30])	Future Annual Reports to provide copy of weeding log summarised the weeding activities undertaken during the reporting period	Low
A19	The Applicant must not undertake extraction within 7.5 m of any Protected Trees without the written agreement of the Planning Secretary under condition A12 of Schedule 2.	Benedict advised that no such activities had been undertaken during the audit period (9/08/23 - 8/08/24). Star pickets & tape used to isolate tree areas. Auditor observed compliance with this practice (refer photos in Appendix F)	Maintain tree protection	Negligble
A20	The Applicant must maintain a minimum 7.5 m setback between Quarrying Operations and any native trees [(Note a)] located in the Restoration Area, except where a reduced setback is supported by an assessment by a suitably qualified and experienced arborist, and evidence of this assessment has been provided to the Planning Secretary. [Note (a): In this condition, the setback is to be measured from the outside of the tree trunk.]	Benedict advised that no such activities had been undertaken during the audit period (9/08/23 - 8/08/24). Star pickets & tape used to isolate tree areas. Auditor observed compliance with this practice (refer photos in Appendix F)	Maintain tree protection	Negligble

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
A21	The Applicant must not carry out any extraction: (a) in Stages 1, 2, 4, 5, 6 or 7 after the date specified in condition 30 of Schedule 1; or, (b) in Stage 3 at any time. Note: Condition 30 of Schedule 1 states that *"The applicant shall ensure that all extraction in Stage 1 and Stage 2 is completed by 30 June, 1995; and Stages 4 to 7 of the development by 31 December 2020."*	Benedict advised that Stages 1 and 2 were completed by 30/06/95 and Stages 4 to 7 were completed by 31/12/20. Auditor observed Stages 1-7 undergoing rehabilitation, with damage caused by flood events (refer photos in Appendix F)	Maintain rehabilitation work and repair of flood damage	Negligble
	LIMITS OF CONSENT - Identification of Approved Disturbance Area			
A22(a)	Prior to the commencement of Quarrying Operations in each of Phases 1 to 7, the Applicant must: a) engage a registered surveyor to mark out the boundaries of the approved limits of extraction for the relevant Substages in each phase (as set out conceptually in the Appendix 1 and as amended by the conditions of this consent); *[Note: Phases 1-7 are parts of the Stage 8 area defined in the consent definitions. Phase 1 = Substages 8A-8B, Phase 2 = Substage 8C, Phase 3 = Substages 8D-8E, Phase 4 = Substages 8F-8G, Phase 5 = Substages 8H-8I, Phase 6 = Substages 8J-8K, Phase 7 = Substages 8L-8M.]*	The Benedict 2023 Annual Review (page 23) advised that Phases 1-7 are parts of the Stage 8 area. Phase 1 is substages 8A-8B and Phase 2 is substage 8C. Both these Phases have been pegged and have been documented by JMD in the Sketch of Setout Works provided as part of Appendix A of the BRMP (page A12).	None required	--
A22(b)	b) submit a survey plan of these boundaries and their GPS coordinates to the Planning Secretary; and	Copy of survey plans for Substages 8D-8M included in Appendix A of EMM plan (11/09/24) and approved by DPHI in 20/09/24 letter. Benedict provided the Auditor with survey plans for Substages 8A-8C, with GPS coordinates shown (refer Section 4.5, Audit Report)	None required	--
A22 (c)	c) ensure that these boundaries are clearly marked at all times during the life of the development in a manner that allows operating staff and inspecting officers to clearly identify those limits.	Boundaries marked with star pickets and flagging tape, which were observed by the Auditor during the site inspection	Benedict to prepare survey plans for subsequent Stage 8 substages	Negligible
	LIMITS OF CONSENT - Quarrying Operations			
A23	Stage 8 Operations may be carried out on the site until 31 December 2035. [Note: Under this consent, the Applicant is required to decommission and rehabilitate the site and carry out other requirements in relation to Quarrying Operations. Consequently, this consent will continue to apply in all respects other than to permit the carrying out of Quarrying Operations until the rehabilitation of the site and other requirements have been carried out to the required standard.]	Not triggered	None required	--
A24	A maximum of 150,000 tonnes of extractive material may be extracted from the site in any calendar year.	The Benedict 2023 Annual Review (page 25) advised that for the calendar year 2023, 72,541 tonnes were extracted from Stage 8.	None required	--
	LIMITS OF CONSENT - Quarrying Product Transport			

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No.	Condition	Observation	Recommendation	Risk Level
A25	Truck movements at the site (i.e. inbound combined with outbound movements) must not exceed: (a) a maximum of 248 movements on any given weekday; (b) an average of 148 movements per weekday, averaged on a weekly basis; and (c) a maximum of 80 movements per day on Saturdays.	The Benedict 2023 Annual Review (page 25) advised that truck volumes to site have been published on the Benedict website (www.benedict.com.au) since January 2021. The data shows that the truck movement volume has not exceeded the consent. This data is updated every 6 months.	None required	--
	LIMITS OF CONSENT - Hours of Operation			
A26	The Applicant must comply with the operating hours set out in Table 1. (Refer Table 1: Operating Hours)	The Benedict 2023 Annual Review advised that general quarry operating hours are Mon-Fri 6am-5pm & Sat 6am-12pm	Maintain compliant operations	Negligible
A27	The following activities may be carried out outside the hours specified in Table 1. (a) delivery or dispatch of materials as requested by Police or other public authorities; and (b) emergency work to avoid the loss of lives, property or to prevent environmental harm. In such circumstances, the Applicant must notify the Department and affected residents prior to undertaking the activities, or as soon as is practical thereafter.	Benedict advised that no outside hours work was undertaken during the audit period (9/08/23 - 8/08/24). No noise issues were made by Councils as part of the Audit process	Maintain compliant operations	Negligible
	EVIDENCE OF CONSULTATION			
A28(a)	Where conditions of this consent require consultation with an identified party, the Applicant must: (a) consult with the relevant party prior to submitting the subject document to the Secretary for approval; and	The NRAR issued Water Licence CAA-2021-11223 for the Stage 8 sand extraction on 11/02/22. A copy of the licence was provided to the auditor. Compliance with licence conditions checked and documented in Section 4.4.3, audit report	Erosion and sediment control measures need to be maintained throughout Stage 8 operations together with mainteance work at end of extraction	Negligible
A28(b)	(b) provide details of the consultation undertaken including: (i) the outcome of that consultation, matters resolved and unresolved; and (ii) details of any disagreement between the party consulted and the Applicant and how the Applicant has addressed the matters not resolved.			
	STAGING, COMBINING & UPDATING STRATEGIES, PLANS OR PROGRAMS			
A29	The Applicant may prepare and submit the Soil and Water Management Plan and/or Biodiversity and Rehabilitation Management Plan required under conditions B36 and B73 of Schedule 2 on a staged basis, prior to the commencement of Quarrying Operations in each of Phases 1 to 7. Quarrying Operations must not commence in any phase until a management plan has been approved by the Planning Secretary for that phase.	The SWMP was first prepared on 24/03/21. Version 3 dated February 2022 was approved by DPHI on 25/03/22. The current version 5 dated 9/09/24 was approved by DPHI on 20/09/24. The BRMP was first prepared on 6/05/21. Version 3 dated 17/01/22 was approved by DPHI on 3/03/22. The current version 5 dated 15/09/24 was approved by DPHI on 20/09/24. Commencement dates for Stages 1 - 8 given in feedback to Condition A5(b)	The SWMP should be updated to confirm the point of water supply for the project (refer technical specialist report, Appn D)	Low

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
A30(a)	With the approval of the Planning Secretary, the Applicant may: (a) prepare and submit any strategy, plan or program required by this consent on a staged basis (if a clear description is provided as to the specific stage and scope of the development to which the strategy, plan or program applies, the relationship of the stage to any future stages and the trigger for updating the strategy, plan or program);	Noted	None required	--
A30(b)	(b) combine any strategy, plan or program required by this consent (if a clear relationship is demonstrated between the strategies, plans or programs that are proposed to be combined); and	Noted	None required	--
A30(c)	(c) update any strategy, plan or program required by this consent (to ensure the strategies, plans and programs required under this consent are updated on a regular basis and incorporate additional measures or amendments to improve the environmental performance of the development).	Noted	None required	--
A31	If the Planning Secretary agrees, a strategy, plan or program may be approved, staged or updated without consultation being undertaken with all parties required to be consulted in the relevant condition in this consent.	Noted	None required	
	PROTECTION OF PUBLIC INFRASTRUCTURE			
A32	Unless the Applicant and the applicable authority agree otherwise, the Applicant must: (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by carrying out the development; and (b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the development. [Note: This condition does not apply to any damage to roads caused as a result of general road usage or otherwise addressed by contributions required by condition 26 of Schedule 1.]	The only public infrastructure at Menangle Quarry is the motorway, which has not been damaged as observed by the Auditor (refer photos in Appendix F)	Benedict to provide data addressing Condition A32 in future Annual Review reports.	Low
	OPERATION OF PLANT AND EQUIPMENT			
A33	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.	A copy of MSS plant & mainteance planner provided (Ref [29]). Benedict advised that all machines were serviced every 500 hours by suppliers who hold maintenance records. Auditor observed all site equipment was operational - refer photos in Appendix F	Benedict to provide a copy of the plant & equipment maintenance planner addressing Condition A33 in future Annual Review reports. MSS to continue proper maintenance of all plant & equipment	Low
	COMPLIANCE			
A34	The Applicant must ensure that all of its employees, contractors (and their sub-contractors) are made aware of, and are instructed to comply with, the conditions of this consent relevant to activities they carry out in respect of the development.	Benedict provided the Auditor with a copy of the environmental awareness training record dated 14/02/23 that showed training was received by 8 employees.	Maintain regular environmental awareness training	Negligible
	APPLICABILITY OF GUIDELINES			

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No.	Condition	Observation	Recommendation	Risk Level
A35	References in the conditions of this consent to any guideline, protocol, Australian Standard or policy are to such guidelines, protocols, Standards or policies in the form they are in as at the date of this consent.	Noted	None required	--
A36	However, consistent with the conditions of this consent and without altering any limits or criteria in this consent, the Planning Secretary may, when issuing directions under this consent in respect of ongoing monitoring and management obligations, require compliance with an updated or revised version of such a guideline, protocol, Standard or policy, or a replacement of them.	Noted	None required	--
	PRODUCTION DATA			
A37	Each year, from the date of commencement of Quarrying Operations in the Stage 8 Area, the Applicant must provide calendar year quarry production data to MEG by no later than 30 January.	The Benedict 2023 Annual Review (page 32) advised that Stage 8 quarry production data was registered on the portal on 7/03/24.	None required	--
A38	The data must be provided using the relevant standard form and a copy of the data must be included in the Annual Review.	Refer Benedict 2023 Annual Review (Section 5)	None required	--
	OTHER STATUTORY APPROVALS, LICENCES AND CONSENTS			
A39	The Applicant must obtain all necessary approvals, licences and consents required for the carrying out of the development, including but not limited to, approvals under the Roads Act 1993, the Water Management Act 2000 and the POEO Act.	The data reviewed by the audit indicate that this condition was likely to have been met during the audit period.	None required	--
PART B: SPECIFIC ENVIRONMENTAL CONDITIONS				
	EARLY WORKS			
B1(a)	The Applicant may prepare an Early Works Construction Environmental Management Plan for the Early Works, to the satisfaction of the Planning Secretary. This plan must: (a) describe measures to be implemented to minimise construction-related impacts on biodiversity, including: (i) specific measures to minimise impacts on tree hollows, termite mounds and fauna; and (ii) detailed procedures for pre-clearance surveys and supervision (by an appropriately qualified person) of the felling of habitat trees within disturbance areas associated with the Early Works;	The Benedict 2023 Annual Review (page 32) advised that this condition was originally inserted by DPE to allow some works to commence while the full management plans were being prepared / approved. It is no longer relevant to the work completed during the audit period.	None required	--
B1(b)	(b) describe measures to be implemented to manage sediment and erosion risks, including: (i) a detailed description of the surface water management measures to be implemented in relation to the Early Works; and (ii) appropriate clean water diversion systems and construction of appropriate erosion and sediment controls for the management of disturbed areas associated with the Early Works;	Benedict 2023 Annual Review (page 32) advised this condition originally inserted by DPE to allow some works to commence while the full management plans were being prepared/ approved. It is no longer relevant to the work completed during the audit period.	None required	--

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No.	Condition	Observation	Recommendation	Risk Level
B1(c) & (d)	(c) include a Trigger Action Response Plan which outlines actions to be undertaken to rectify impacts associated with erosion and sedimentation during the Early Works (to the extent that these actions are not addressed by other management plans required to be in place prior to the commencement of Early Works); and (d) describe detailed procedures to be implemented to receive, record, handle and respond to complaints associated with the Early Works construction.	Not applicable for work conducted during the audit period.	None required	--
B2	If the Applicant opts to seek approval for Early Works, the Applicant must not commence Early Works until the Early Works Construction Environmental Management Plan is approved by the Planning Secretary.	Not applicable for work conducted during the audit period.	None required	--
B3	If the Planning Secretary approves an Early Works Construction Environmental Management Plan, the Applicant must implement that plan as approved by the Planning Secretary.	Not applicable for work conducted during the audit period.	None required	--
	NOISE			
	Operational Noise Criteria			
B4	The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 2 at any Residence on privately-owned land. [Refer Table 2: Operational Noise Criteria dB(A)]	The noise criteria included in the EMM (28/06/24) NMP corresponded to those specified by the Consent & EPL. The Benedict 2023 Annual Review advised that a Noise Compliance Assessment was conducted in the first two months of operations, with a copy provided to the NSW EPA.	None required	--
	Noise generated by the development must be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy (EPA, 2000). Appendix 4 sets out the meteorological conditions under which these criteria apply and the requirements for evaluating compliance with these criteria.			
B5	The noise criteria in condition B4 do not apply if the Applicant has an agreement with the owner/s of the relevant residence or land to exceed the noise criteria, and the Applicant has advised the Department in writing of the terms of this agreement.	No agreement required	None required	--
	Noise Operating Conditions			

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No.	Condition	Observation	Recommendation	Risk Level
B6	The Applicant must: (a) take all reasonable steps to minimise all noise from operational activities, including low frequency noise and other audible characteristics, as well as road noise associated with the development; (b) take all reasonable steps to minimise the noise impacts of the development during noise-enhancing meteorological conditions, particularly when the noise criteria in this consent do not apply (see Appendix 4); (c) carry out regular attended noise monitoring (every three months unless otherwise agreed with the Planning Secretary) to determine whether the development is complying with the relevant conditions of Schedule 2; and (d) regularly assess the noise monitoring data and modify or stop operations on the site to ensure compliance with the relevant conditions of Schedule 2.	The Benedict 2023 Annual Review advised that site operations complied with Condition B6. Noise controlled by operating within approved hours, use of non-audible reversing sounds, machines well maintained, no crushing, only soft excavation work. Noise generated by Menangle Quarry less than the two main off-site sources, namely, vehicles using the motorway and Menangle Road.	Maintain compliant operations	Negligible
	Noise Management Plan			
B7(a)	The Applicant must prepare a Noise Management Plan for the development to the satisfaction of the Planning Secretary. This plan must: (a) be prepared by a suitably qualified and experienced person/s;	An updated draft NMP was prepared by EMM and approved by the NSW EPA in a 26/11/20 letter. The current NMP dated 28/06/24 was prepared by EMM and approved by DPHI in a 13/09/24 letter.	None required	--
B7(b)	(b) be prepared in consultation with the EPA;	The NMP (Section 1.9) advised that it was prepared in consultation with the NSW EPA. Consultation included an EMM letter (14/10/20), provision of a draft plan, and consultation during preparation of the MOD2 application. On 6/06/24, the NSW EPA raised no concerns regarding the project.	None required	--
B7(c)	(c) describe the measures to be implemented to ensure: (i) compliance with the noise criteria and operating conditions in this consent; (ii) best practice noise management is being employed; and (iii) noise impacts of the development are minimised during noise-enhancing meteorological conditions under which the noise criteria in this consent do not apply (see Appendix 4); and	The NMP (Section 4) described noise mitigation measures to be implemented. These measures included design controls, meteorological forescating, change management, training and road traffic. These measures were approved by DPHI in a 13/09/24 letter.	None required	--
B7(d)	(d) include a monitoring program that: (i) is capable of evaluating the performance of the development against the noise criteria; (ii) monitors noise at the nearest and/or most affected residences; and (iii) includes a protocol for identifying any noise-related exceedance, incident or non-compliance and for notifying the Department and relevant stakeholders of these events.	The NMP (Section 5) described a noise monitoring program to be implemented. This program was approved by DPHI in a 13/09/24 letter.	None required	--
B8	The Applicant must not commence Quarrying Operations in the Stage 8 Area until the Noise Management Plan is approved by the Planning Secretary.	An updated draft NMP was prepared by EMM and approved by the NSW EPA in a 26/11/20 letter. The current NMP dated 28/06/24 was prepared by EMM and approved by DPHI in a 13/09/24 letter.	None required	--

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No.	Condition	Observation	Recommendation	Risk Level
B9	The Applicant must implement the Noise Management Plan as approved by the Planning Secretary	The Benedict 2023 Annual Review (Appendix A) included 2 noise assessments prepared by EMM dated 31/10/23 and 12/03/24, which concluded that noise levels complied with all relevant limits.	Ongoing noise monitoring required in accordance with Consent. Address review comments provided by DPHI in 2/08/24 letter on Benedict 2023 Annual Review report.	Negligible
	AIR QUALITY			
	Odour			
B10	The Applicant must ensure that no offensive odours (as defined under the POEO Act) are emitted by the development.	Section 4.3 AQMP advised low risk of odour generating activities at site. The Benedict 2023 Annual Review advised no odour complaints received during audit period. Benedict advised size of compost / manure stockpiles kept minimal in a continuous operation. Stockpile size maintained at about 500m^3 at any one time.	Continue implementing AQMP and monitor air quality on annual basis as per EMM (16/02/24). Address review comments provided by DPHI in 2/08/24 letter on Benedict 2023 Annual Review report.	Negligible
	Air Quality Criteria			
B11	The Applicant must ensure that particulate matter emissions generated by the development do not cause exceedances of the criteria in Table 3 at any residence on privately-owned land. [Refer Table 3: Air Quality Criteria]	Air quality criteria in AQMP agrees with Consent	None required	--
B12	The air quality criteria in Table 3 do not apply if the Applicant has an agreement with the owner/s of the relevant residence to exceed the air quality criteria, and the Applicant has advised the Department in writing of the terms of this agreement.	Benedict confirmed that no such agreement exists as none has been required	None required	--
	Air Quality Operating Conditions			
B13 (a)	The Applicant must: (a) take all reasonable steps to: (i) minimise odour, fume, greenhouse gas and dust (including PM10 and PM2.5) emissions of the development; (ii) minimise any visible off-site air pollution generated by the development; and (iii) minimise the extent of potential dust generating surfaces exposed in the Stage 8 Area at any given point in time;	AQMP (Section 5.2) concluded that risk of adverse air quality impacts in surrounding environment from compliant operations at quarry was low. Benedict 2023 Annual Review advised no non-compliances. Automatic sprays, haul roads have 20km/hr speed limits, keep equipment movements to minimum, suspend dusty operations on a windy day. No dust complaints received during audit period. Auditor observed dust control measures being implemented (refer photos Appendix F).	Maintain compliant operations	Negligible
B13(b)	(b) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (Note: Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Planning Secretary]			
B13(c)	(c) carry out regular air quality monitoring to determine whether the development is complying with the relevant conditions of Schedule 2; and	EMM (16/02/24) report documents air quality monitoring for ash content, combustible matter and ambient air at 2 to 3 locations between 31/09/23 and 10/01/24.	Maintain compliant operations	Negligible

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
B13(d)	(d) regularly assess meteorological and air quality monitoring data and relocate, modify or stop operations on the site to ensure compliance with the relevant conditions of Schedule 2.	The Benedict 2023 Annual Review did not record any non-compliances with AQMP. The EMM (16/02/24) report did not record any exceedances likely to have been caused by on-site operations.	Maintain compliant operations	Negligible
B13A(a)	The Applicant must construct and maintain all haul roads to minimise: (a) excessive dust emissions by (including but not limited to): (i) sealing the road surface with a clean coarse aggregate or equivalent, and minimising the surface silt content of the roads or implementing other surface treatment options such as chemical suppressants or paving; and (ii) watering the haul roads at the appropriate water rate when in use.	Refer feedback to Condition B13(a) & (b)	Maintain compliant operations	Negligible
B13A(b)	(b) erosion and sediment loss through the appropriate design and installation of drainage having regard to the Erosion and sediment control on unsealed roads A field guide for erosion and sediment control maintenance practices (OEH 2012) or latest version.	Auditor observed erosion and sediment control measures (refer photos in Appendix F). Flood events cause deposition of silt/sand across flooded areas. Some evidence of soil erosion along escarpment slope that needed to be repaired.	Benedict to provide data addressing Condition B13A in future Annual Review reports and document repair work caused by flood events	Low
	Air Quality Management Plan			
B14(a)	The Applicant must prepare an Air Quality Management Plan for the development to the satisfaction of the Planning Secretary. This plan must: (a) be prepared by a suitably qualified and experienced person/s;	AQMP prepared by EMM and initially approved by NSW EPA on 26/11/20 and DPHI on 14/04/21 (Section 1.9.1, EMM 28/06/24). Current AQMP dated 28/06/24 approved by DPHI on 13/09/24.	Review AQMP at least every 3 years or as directed by the Planning Secretary, as specified in the AQMP (Section 6.7).	--
B14(b)	(b) be prepared in consultation with the EPA;	AQMP (Section 1.9) advised that it was prepared in consultation with NSW EPA. Consultation included EMM letter (14/10/20), provision of draft plan, and consultation during preparation of MOD2 application. On 6/06/24, NSW EPA raised no concerns regarding project.	None required	--
B14(c)	(c) describe the measures to be implemented to ensure: (i) compliance with the air quality criteria and operating conditions in this Schedule; (ii) best practice air quality management is being employed; and (iii) air quality impacts of the development are minimised during adverse meteorological conditions and extraordinary events; and	Refer Section 5, AQMP approved by DPHI in 13/09/24 letter. The EMM (16/02/24) report did not record any exceedances likely to have been caused by on-site operations.	Maintain compliant operations	Negligible
B14(d)	(d) include an air quality monitoring program that: (i) is capable of evaluating the performance of the development against the air quality criteria; and (ii) includes a protocol for identifying any air quality-related exceedance, incident or non-compliance and for notifying the Department and relevant stakeholders of these events.	Refer Section 6, AQMP approved by DPHI in 13/09/24 letter. The EMM (16/02/24) report did not record any exceedances likely to have been caused by on-site operations.	Maintain compliant operations	Negligible

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
B15	The Applicant must not commence Quarrying Operations in the Stage 8 Area until the Air Quality Management Plan is approved by the Planning Secretary.	AQMP initially approved by DPHI on 14/04/21 (Section 1.9.1, EMM 28/06/24). Current AQMP dated 28/06/24 approved by DPHI on 13/09/24. The Benedict 2023 Annual Review advised that Stage 8 quarrying operations commenced on 4/09/23.	None required	--
B16	The Applicant must implement the Air Quality Management Plan as approved by the Planning Secretary.	Available data indicates general compliance with approved AQMP.	Continue to implement approved AQMP	--
	METEOROLOGICAL MONITORING			
B17 (a)	Prior to the commencement of Quarrying Operations in the Stage 8 Area, and for the life of the development, the Applicant must ensure that there is a suitable meteorological station operating in close proximity to the site that: (a) complies with the requirements in the Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales (DEC, 2007); and	The Benedict 2023 Annual Review advised that the meteorological station was fully Installed and operational at the site weighbridge since 3/08/2022. The AQMP (Section 6.2.3) advised that the station complied with the Consent requirements. Auditor observed weather station in operation	Maintain compliant operations	Negligible
B17(b)	(b) is capable of measuring meteorological conditions in accordance with the NSW Industrial Noise Policy (EPA, 2000), unless a suitable alternative is approved by the Planning Secretary following consultation with the EPA.		Maintain compliant operations	Negligible
	SOIL AND WATER			
B18	The Applicant must ensure that diesel spills and the like are cleaned up immediately so as not present a risk to water quality if the relevant Substage is inundated by floodwaters.	SWMP (Section 6.7) requires spill kit available, diesel and other spills cleaned up immediately, appropriate action to notify appropriate regulatory authorities and report incident in accordance with the quarry EMS requirements. Detailed procedures also specified in Benedict (8/08/22) PIRMP. The Benedict 2023 Annual Review indicated no diesel spills have occurred. During site inspection, the Auditor observed that the 30,000L diesel AST was self biunded, a diesel spill kit was present, and there was no evidence of significant petroleum spills	Continue implementing SWMP and PIRMP and document any diesel spills in Annual Review reports. Address review comments provided by DPHI in 2/08/24 letter on Benedict 2023 Annual Review report.	Negligible
	Groundwater Monitoring and Management			
B19	The Applicant must monitor groundwater levels at Groundwater Bores BH01_S, BH01_D, BH02, BH03 and BH04 as shown in Figure 1 in Appendix 5, using continuous data loggers, for the duration of Quarrying Operations in the Stage 8 Area.	The two EMM (27/02/23; 2/05/24) report showed that groundwater levels are continuously being monitored but some equiment failures in some data loggers have occurred. MSS also provided spreadsheet summarising groundwater level data (Ref [31]).	Groundwater level data continues to be downloaded each quarter and faulty equipment replaced. If equipment failures persist, download data monthly and/or install better equipment with a longer design life.	Low

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
B20	The Applicant must ensure that Quarrying Operations do not compromise the integrity of the monitoring bores identified in condition B19 of Schedule 2.	All 5 wells were sampled on 20/01/23 and 10/04/24. Auditor inspected all wells (refer photos in Appendix F)	Auditor considers the acidic levels measured by past GMEs in alluvium may not be represent-ative of field conditions. For future GMEs, wells are to be developed & purged prior to each sampling event. Care needs to be taken in filtering samples in field to minimise impacts from suspended sediment. Consultant to assess groundwater quality data. Benedict to notify DPHI, NSW EPA-Water Group and relevant stakeholders if acidic levels continue to be measured in alluvium outside trigger level	Low
B21	The Applicant must: (a) collect groundwater quality samples at each of the monitoring locations identified in condition B19; and (b) analyse collected groundwater quality samples for all major anions and cations and field parameters; on an annual basis for the duration of Quarrying Operations in the Stage 8 Area.	Condition met - refer results for GMEs conducted on 20/01/23 and 10/04/24 documented in EMM (27/02/24; 2/05/24) reports.		
B22(a)	The Applicant must ensure that: (a) temporary bores are drilled or augered progressively in each Substage to determine the local water table position immediately prior to commencing extraction in each Substage; and	Benedict advised that water level data obtained from wells & survey control data are used to determine excavation depth	Consultant to asess need for temporary bores in future groundwater monitoring reports	Low
B22(b)	(b) the pit floor in each Substage remains at least 1 metre above the measured water table level averaged over a seven-day period following the date of drilling or augering.	SWMP (Section 6.4.1) advised that soils will be extracted by excavator so extraction area base remains >1 m above measured water table level averaged over a 7 day period following date of installation.	Benedict to provide data in future annual reports addressing this condition for Stage 8 areas where quarrying has occurred	Low
	Water Supply and Licensing			
B23	The Applicant must ensure that it has sufficient water for all stages of the development, and if necessary, adjust the scale of the development to match its available water supply.	Water obtained from River as a controlled activity under NRAR licence CAA-2021-11223. Benedict advised that a log is kep for how much water is extracted each day. The water extraction meter is still broken and its logged with Water NSW to be repaired (Ref [31]).	Water extraction data to be included in future Annual Reports. WaterNSW to repair water extraction meter.	Low
B24	The Applicant must develop a groundwater model using a variant of Modflow standard software, or equivalent software, to quantify the progressive takes from water sources during Quarrying Operations in the Stage 8 Area.	Documented in Section 6.2 & Appendices D & E of SWMP.	None required	--
B25(a)	The Applicant must: (a) initially construct the groundwater model required under condition B24 of Schedule 2 using the first three months of groundwater monitoring data collected from 17 June 2020 to 16 September 2020;	Documented in Section 6.2 & Appendices D & E of SWMP.	None required	--
B25(b)	(b) update the groundwater model following collection of the first 12 months of data collected from 17 June 2020 to 16 June 2021; and	Documented in Section 6.2 & Appendices D & E of SWMP.	None required	--
B25(c)	(c) incorporate the outputs of the groundwater model into the Site Water Balance as required under condition B36(c)(i) of Schedule 2.	Documented in SWMP (Section 6.2 & Appns D & E). SWMP (Section 6.2) advises that the site water balance will be updated annually.	Site water balance to be updated annually and included in future Annual Reports	Low

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
B26	If a potential flood event (equivalent to a level of 64 m AHD at Menangle Weir, which represents the approximate height of overtopping of the Nepean River bank) does not occur between 17 June 2020 to 16 June 2021, then the Applicant must update the groundwater model required under condition B24 of Schedule 2 following the first flood event equivalent to or greater than this level when it occurs.	Addressed in Section 6.2 & Appendices D & E of SWMP.	None required	--
B27	The Applicant must obtain any necessary Water Access Licences for the development under the Water Act 1912 and/or the Water Management Act 2000.	Auditor reviewed the Controlled Activity Approval (CAA) was granted by NRAR on 14/02/22 (CAA-2021-11223) for STAGE 8 sand extraction. MSS provides copy of water use log book to Water NSW, with a copy provided in Appendix I of the 2023 annual review report.	Maintain compliant operations	Negligible
B28	When making an application for any necessary Water Access Licence, the Applicant must specify the annual take of water from each affected water source, as estimated by the groundwater model required under condition B24 of Schedule 2.	SWMP (Section 1.9.2) advised that a Controlled Activity Approval (CAA) was granted by NRAR on 14/02/22 (CAA-2021-11223) for Substages 8A-8C sand extraction.	None required	--
B29	Should the maximum annual water take as calculated by the groundwater model increase due to subsequent revisions of the groundwater model, as required under conditions B25 and B26 of Schedule 2, the Applicant must acquire the necessary additional licence shares to account for the maximum predicted annual volume.	SWMP (Section 1.9.2) advised that a Controlled Activity Approval (CAA) was granted by NRAR on 14/02/22 (CAA-2021-11223) for Substages 8A-8C sand extraction. MSS provides copy of water use log book to Water NSW, with a copy provided in Appendix I of the 2023 annual review report.	Benedict to determine need to acquire additional licence shares.	Low
B30	The Applicant must report on any water captured, intercepted or extracted from the site each year (directly and indirectly) in the Annual Review, including water taken under each Water Access Licence as applicable.	SWMP (Section 6.2) requires annual review of the water balance based on the collection of 12 months of data, which could be done from September 2024. Benedict advised that recording started in March 2024 and the data will be provided in the next annual report	Benedict to provide data in next annual report. Benedict to also address review comments provided by DPHI in 2/08/24 letter on Benedict 2023 Annual Review report.	Low
	Soil Erosion			
B31	The Applicant must install and maintain suitable erosion and sediment control measures in the Stage 8 Area. These measures must be designed and implemented having regard to the guidance series Managing Urban Stormwater: Soils and Construction, and be detailed in the Soil and Water Management Plan required under condition B36 of Schedule 2.	Erosion and sediument control measures are provided in the SWMP (Section 7.2). The SWMP was prepared by EMM dated 9/09/24 and approved by DPHI on 20/09/24. Auditor observed implemented measures included silt fences outside extraction area, hydromulching & tree planting (refer photos in Appendix F)	Maintain compliant operations	Negligible
	Flood Management			

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
B32(a)	The Applicant must prepare a Flood Management Plan for the development to the satisfaction of the Planning Secretary. This plan must: (a) be prepared by suitably qualified and experienced person/s;	FMP dated 25/02/22 prepared by EMM and approved by DPHI on 25/10/22. FMP (Section 6.6) requires ongoing review and improvement.	FMP to be subject to ongoing review and improvement as may be required.	Negligible
B32(b)	(b) identify measures to: (i) proactively prepare for, and respond to, any flood event in which the active extraction area is likely to be inundated by floodwaters emanating from the Nepean River; (ii) ensure the safety of site personnel; (iii) minimise, to the greatest extent practicable, the areas of exposed ground on the site that would be susceptible to flood risks (including scour and erosion and potential transport of sediment to downstream waters); (iv) ensure that the active extraction area in any Substage does not exceed 0.33 hectares at any one time; (v) ensure that the batter adjacent to the Nepean River Buffer Zone does not exceed: • a maximum slope of 1:1 at any time; and • a maximum slope of 1:5 in preparation for flood events; (vi) ensure that no more than a 30 metres length of the batter adjacent to the Nepean River Buffer Zone (measured in total) has a slope exceeding 1:5 at any one time; and (vii) rectify any flood-related damage to areas undergoing rehabilitation; and	FMP (Section 5) specifies environmental management measures covering horizontal setback, batter angles, flood mitigation, final landform, groundwater model update and trigger response plan. Benedict advised that two flood events occurred during the Audit Period on 8/04/24 and 8/06/24. Copies of photos provided in audit report.	Continue to implement measures specified in Section 5, FMP	Negligible
B32(c)	(c) include a Trigger Action Response Plan which outlines actions to be undertaken in preparation for, and immediately following, a flood event including detailed protocols and timeframes for: (i) backfilling the active extraction area to achieve a maximum batter slope of 1:5 adjacent to the Nepean River Buffer Zone in preparation for flood events; (ii) avoiding the downstream movement of debris from the site; (iii) recommencing Quarrying Operations following a flood event; and (iv) rectifying any damage to areas undergoing rehabilitation following a flood event.	Benedict provided a Job Safety Analysis (JSA) "Flood Evacuation Response Plan" dated 18/03/21	Ongoing need for Benedict to properly implement the Flood Evacuation Response Plan. Environmental awareness training needs to be undertaken regularly	Negligible
B33	The Applicant must not commence Quarrying Operations in the Stage 8 Area until the Flood Management Plan is approved by the Planning Secretary.	DPHI approval of FMP issued 25/10/2022. The Benedict 2023 Annual Review advised that Stage 8 quarrying operations commenced on 4/09/23.	None required	--
B34	The Applicant must implement the Flood Management Plan as approved by the Planning Secretary.	Available data indicates general compliance with approved FMP.	Continue to implement approved FMP	--
B35	The Applicant must ensure that the flood storage capacity of the final rehabilitated landform is no less than the preexisting flood storage capacity at all stages of the development, unless otherwise approved in writing by the Planning Secretary. Details of the available flood storage capacity must be reported in the Annual Review.	Benedict advised that the only substage that has been finally rehabilitated is substage 8A. Before and after levels indicate a range of level reductions of between 2.08m and 5.1m, with the mean reduction in landform level 4.198m. This means that the flood storage capacity has increased. Auditor observed general lowering of landform level (refer photos in Appendix F)	Maintain compliant operations	Negligible

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
	Soil and Water Management Plan			
B36(a)	The Applicant must prepare a Soil and Water Management Plan for the development to the satisfaction of the Planning Secretary. This plan must: (a) be prepared by suitably qualified and experienced person/s;	SWMP prepared by EMM. Version 3 dated February 2022 approved by DPHI on 25/03/22. Current version 5 dated 9/09/24 approved by DPHI on 20/09/24	Periodically review SWMP in accordance with Condition D5, as recommended in Section 1.9 of the SWMP.	--
B36(b)	(b) be prepared in consultation with EPA and DPIE Water; and	SWMP (Section 1.9) advised that it was prepared in consultation with NSW EPA and DPIE Water. Consultation included EMM invitation to provide input followed by EPA (26/11/20) supporting letter, draft SWMP issued 14/03/21, feedback from NRAR on 11/06/21, consultation with agencies during MOD2 application, Planning Secretary approval of initial SWMP on 25/03/22.	None required	--
B36(c)(i)	(c) include a: (i) Site Water Balance that: • includes details of: sources and security of water supply; water use and management on the site; reporting procedures, including the annual preparation of a site water balance; • minimises clean and potable water use on the site; • incorporates the outputs of the groundwater water model required under condition B24 of Schedule 2;	Site Water Balance provided in SWMP Section 5.3. The SWMP was approved by DPHI on 20/09/24.	None required	--
B36(c)(ii)	(ii) Surface Water Management Plan, that includes: • detailed baseline data on surface water flows and quality in watercourses and/or water bodies that could potentially be affected by the development; • surface water impact assessment criteria, including trigger levels for investigating any potentially adverse impacts, and surface water management performance measures; • a detailed description of the surface water management system on the site, including the: clean water diversion system; erosion and sediment controls (including the construction of bunds and swales within each Substage); and, water storages (including a description of measures to maintain the storage capacity of sediment basins); • a program to monitor and report on: any surface water discharges; the effectiveness of the water management system; surface water quality in sediment basins; and water levels and quality in the Nepean River both upstream and downstream of the site; and • a protocol for identifying and investigating any exceedances of the surface water impact assessment criteria and for notifying the Department and relevant stakeholders of these events;	The SWMP (Section 5) provides a surface water management plan that includes: • Baseline surface water data; • Surface water management; • Site water balance; • Surface water monitoring program; • Surface water assessment criteria and trigger values; • Surface water Trigger Action Response Plan; • Summary of surface water management actions; and • Data management and reporting. The SWMP was approved by DPHI on 20/09/24.	None required	--

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
B36(c) (iii)	Groundwater Management Plan that includes: • all available baseline data for the site; • groundwater performance criteria, including trigger levels for investigating any potentially adverse groundwater impacts, particularly with respect to aquatic habitat and regional groundwater systems; • a protocol to ensure that Quarrying Operations do not exceed the extraction depth limit specified in condition B22(b) of Schedule 2; • measures to ensure that the integrity of the groundwater monitoring network is not compromised by Quarrying Operations; • a clear description of the reporting processes and procedures to be adopted for the routine collation, analysis and provision of monitoring data as required under conditions B21 and B22 of Schedule 2; and • a protocol for identifying and investigating any exceedances of the groundwater performance criteria and for notifying the Department and relevant stakeholders of these events.	The SWMP (Section 6) provides a surfgroundwater management plan that includes: • Groundwater monitoring network; • Groundwater modelling; • Baseline groundwater data; • Groundwater monitoring program; • Groundwater assessment criteria and trigger values; • Groundwater Trigger Action Response Plan; • Summary of groundwater management measures; and • Data management and reporting. The SWMP was approved by DPHI on 20/09/24.	None required	--
B37	Subject to condition A29, the Applicant must not commence Quarrying Operations in the Stage 8 Area until the Soil and Water Management Plan is approved by the Planning Secretary.	SWMP (version3) approved by DPHI on 25/03/22. Current SWMP (version 5) dated 9/09/24 approved by DPHI on 20/09/24. The Benedict 2023 Annual Review advised that Stage 8 quarrying operations commenced on 4/09/23.	None required	--
B38	The Applicant must implement the Soil and Water Management Plan approved by the Planning Secretary.	Available data indicates general compliance with approved SWMP. Benedict advised during the on-site meeting on 24 October 2024 that operations at the Menangle Quarry do involve importing compost & cow manure with about 500 m3 present at any one time. The compost and cow manure is placed in a single area located about 300m from the edge of the Nepean River and does not remain stockpiled for long as it is continuously being used and replenished.	Maintain compliant operations. The Auditor considered that the use of compost and cow manure at the quarry was likely to pose a low risk to water quality in the Nepean River, but considered that some additional protocols could be implemented to further reduce the risk of impact. These additional protocols are provided in Section 4.7.1 of the Audit Report.	Low
B39	The Applicant must ensure that all surface discharges from the site comply with the relevant provisions of the POEO Act.	Benedict advised that no offsite discharges have occurred and surface water is unable to leave the site. Auditor observed no discharges (refer photos in Appendix F)	Maintain compliant operations	Negligible
	Ephemeral Creek Management Plan			

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
B40(a)	The Applicant must prepare an Ephemeral Creek Management Plan for the development to the satisfaction of the Planning Secretary. This plan must: (a) be prepared by suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary;	A ECMP dated 9/09/24 was prepared by Tooker & Associates, GRC Hydro and EMM and included in the SWMP (Appendix C) that was approved by DPHI on 20/09/24. Benedict advised that works in the Stage 8E area not scheduled to commence until after 2025	None required	--
B40(b)	(b) describes the measures that would be implemented to manage and control soil erosion and bank stabilisation (if required) and limit the risk of impacts on downstream receiving environments;	Measures provided in ECMP	None required	--
B40(c)	(c) provide details of the methods and timing of extraction within Substages 8E, 8F or 8G that demonstrate the integrity of the ephemeral creek (shown conceptually in Figure 5 of Appendix 1) would be maintained for as long as practicable during operations;	ECMP advised that these works will be undertaken prior to sand extraction in Substages 8E, 8F & 8G. Operations in these substages not commenced during audit period	Benedict to advise on status of these works & document them in next Annual report	Low
B40(d)	(d) provide for construction and stabilisation of appropriate diversion channels to divert surface water flows around the disturbance area, unless otherwise approved by the Planning Secretary;	ECMP advised that surface runoff from disturbed / unrehabilitated extraction area will be diverted to a sediment pond and be prevented from flowing into the realigned creek or Nepean River		
B40(e)	(e) provide final designs for the road crossing and realigned section of creek that are supported by hydrological modelling and meet the rehabilitation objectives in Table 4; and	The realigned channel and road crossing details and hydrological modelling provided in ECMP (Appendix A).	None required	--
B40(f)	(f) describe the methods and timing for rehabilitation of the final realigned section of creek channel	Methods described in ECMP.	None required	--
B41	The Applicant must not undertake any construction activities or Quarrying Operations within Substages 8E, 8F or 8G until the Ephemeral Creek Management Plan is approved by the Planning Secretary.	At time of site inspection, quarrying was occurring in Stage 8C. Stage 8D expected to commence towards end of 2024. Construction activities or quarrying operations not commenced within substages 8E - 8G during audit period	Maintain compliant operations	Negligible
B42	The Applicant must implement the Ephemeral Creek Management Plan approved by the Planning Secretary.	Condition not yet triggered	Maintain compliant operations	Negligible
	TRANSPORT			
	Works within Hume Highway Motorway Road Reserve			
B43	Prior to commencing Quarrying Operations in the Stage 8 Area, the Applicant must make an application to TfNSW under Section 138 of the Roads Act 1993 for any proposed works within the Hume Highway Motorway Road Reserve (including the area under the Menangle Bridges).	Benedict advised that WAD # SYD17/00793/04 between TfNSW & Menangle Sand & Soil was completed with construction securities accepted on 7 December 2022.	None required	--

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
B44	The Applicant must enter into a legally binding agreement with TfNSW (eg a licence, not a lease or an easement), for the operation and ongoing maintenance of the section of the haul road and associated infrastructure within the Hume Highway Motorway Road Reserve (including under the Menangle Bridges). The legally binding agreement must be executed prior to any construction within the road reserve. All TfNSW legal costs associated with drafting and executing the legally binding agreement must be borne by the Applicant.	Benedict advised that WAD # SYD17/00793/04 between TfNSW & Menangle Sand & Soil was completed with construction securities accepted on 7 December 2022.	None required	--
B45(a)	The Applicant must: (a) provide an appropriately designed sealed access under and adjacent to the Menangle Bridges and comply with TfNSW drainage and pavement standards;	Benedict advised that WAD # SYD17/00793/04 between TfNSW & Menangle Sand & Soil was completed with construction securities accepted on 7 December 2022. Auditor inspected site & verified the completion of this work and maintenance of the sealed access (refer photos in Appendix F)	None required	--
B45(b)	Deleted			
B45(c)	(c) provide unrestricted access to TfNSW to undertake maintenance on the Menangle Bridges and associated facilities at all times;			
B45(d)	(d) remove any detritus associated with the construction and use of the access and haul road under and adjacent to the Menangle Bridges; and			
B45(e)	(e) protect the piers of the Menangle Bridges, as well as any other part of the bridge structure and associated facilities from any potential damage as a result of the development;			
B46(a)	In making the application to TfNSW required under condition B43, the Applicant must provide: (a) details demonstrating how the requirements in condition B45 will be met during the early establishment phase of the development, including: (i) sealing and drainage design details for the access road under and adjacent to the Menangle Bridges; and (ii) anchoring details for any structure(s) associated with the development that may become floating debris during flood events; &	Benedict advised that WAD # SYD17/00793/04 between TfNSW & Menangle Sand & Soil was completed in accordance with 13 December 2022approval. Auditor observed the completion of this work (refer photos in Appendix F)	None required	--
B46(b)	(b) details demonstrating how the compliance with the requirements in condition B45 will be maintained over the life of the development.			
B47	The Applicant must ensure that works undertaken within the Hume Highway Motorway Road Reserve do not in any way destabilise the foundations of the Hume Highway, including the Menangle Bridges. Should rectification works be required as a result of the development, they must be undertaken by the Applicant in accordance with TfNSW requirements and standards, and at no expense to TfNSW.	Refer feedback to Condition B45	None required	--
B48	The Applicant must not undertake any works within the Hume Highway Motorway Road Reserve (including the area under the Menangle Bridges) without the consent of TfNSW under Section 138 of the Roads Act 1993.	Refer feedback to Condition B45	None required	--

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
	Road Safety and Condition Audit			
B49(a)	Within 12 months of commencing Quarrying Operations in the Stage 8 Area, and every five years thereafter until the conclusion of Quarrying Operations, the Applicant must undertake a Road Safety and Condition Audit for the development, to the satisfaction of the Planning Secretary. This Audit must: (a) be undertaken by a suitably qualified independent expert/s whose appointment has been endorsed by the Planning Secretary;	The Benedict 2023 Annual Review advised that Stage 8 quarrying operations commenced on 4/09/23. A Road Safety and Condition Audit needed to be completed by 4/09/24, which is outside the audit period (9/08/23 - 8/08/24). The Road Safety & Condition Audit was conducted on 28/02/25 (Ref [29]). An annual report on structural condition of road for TfNSW will be done at the same time if possible.	Benedict include a copy of the Road Safety & Condition Audit and road structural condition assessment in the next Annual Report. Maintain internal roads in good condition.	Low
B49(b)	(b) be prepared in consultation with Council;	Refer feedback to Condition B49(a)	Benedict to undertake Road Safety and Condition Audit and road structural condition assessment no later than 27/11/24 and document the results in the next Annual Report	Low
B49(c)	(c) assessment the safety, performance and condition of the site's vehicular access onto Menangle Road, including the associated acceleration and deceleration lanes;			
B49(d)	(d) identify any road works that are required to ensure compliance with relevant Austroads standards or relevant Council requirements;			
B49(e)	(e) be documented in a Road Safety and Condition Audit Report which must be submitted to Council and the Planning Secretary for approval within three months of commencing the Audit.			
B50	Within 12 months of completing each Road Safety and Condition Audit required under condition B49 of this Schedule, unless otherwise agreed by the Planning Secretary, the Applicant must complete any road works recommended in the Audit, to the satisfaction of Council. If there is a dispute regarding the implementation of any recommendations contained in the Audit, the Applicant may refer the matter to the Planning Secretary for	Refer feedback to Condition B49(a)	Benedict to undertake Road Safety and Condition Audit and road structural condition assessment no later than 27/11/24 and document the results in the next Annual Report	Low
	Continuation of Rehabilitation Levy			
B51	For the duration of the Stage 8 Operations, the Applicant must continue to pay Council a rehabilitation levy on all sand and soil removed from the Stage 8 Area in accordance with the existing rates, calculation methods and indexation required under condition 26 of Schedule 1. The first instalment of these payments is to be made based on the most recent Index Review Date under Schedule 1.	Benedict advised that the Trust Deed was logged in September 2024 and that Benedict was waiting for feedback from DPHI	Maintain compliant operations	Negligible
	Monitoring of Product Transport			
B52	The Applicant must keep accurate records of all truck movements to and from the site (including time of arrival and dispatch) and publish a summary of records on its website every 6 months.	Weighbridge data is collected for each truck movement. A summary of truck movements for each 6-month period between January 2021 and June 2023 published on the website.	Maintain compliant operations	Negligible
	Transport Operating Conditions			
B53	No direct access to or from the development via the Hume Highway is permitted.	Auditor confirmed this requirement was being met	Maintain compliant operations	Negligible

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
B54(a)	The Applicant must: (a) ensure that all laden trucks entering or exiting the site have their loads covered;	Benedict advised operations were compliant. 'Cover your load' sign at the exit gate. Speed limit decreased to 20km/hr with site induction protocols updated. Auditor observations consistent with these conditions (refer photos in Appendix F)	Maintain compliant operations	Negligible
B54(b)	(b) ensure that all laden trucks exiting the site are cleaned of material that may fall from vehicles, before leaving the site;			
B54(c)	(c) take all reasonable steps to minimise traffic safety issues and disruption to local road users; and			
B54(d)	(d) take all reasonable steps to ensure that appropriate signage is displayed on all trucks used to transport quarry products from the development so they can be easily identified by other road users.			
	Off-road Haul Truck Operating Conditions			
B54A(a)	The Applicant must: (a) prevent headlights from the off-road haul truck impacting upon the Hume Motorway; and	Benedict advised operations were compliant. Speed signs onsite and 20km/hr included in the site induction	Maintain compliant operations	Negligible
B54A(b)	(b) ensure the off-road haul truck operating within the site is restricted to a travel speed of 20 km/hour or less			
	Traffic Management Plan			
B55(a)	The Applicant must prepare a Traffic Management Plan for the development to the satisfaction of the Planning Secretary. This plan must: (a) be prepared by suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary;	A TMP dated 30/11/23 was prepared by EMM and approved by DPHI on 13/09/24.	None required	--
B55(b)	(b) be prepared in consultation with TfNSW and Wollondilly Shire and Campbelltown Councils;	The TMP (Section 1.14) documented consultation undertaken with TfNSW, Wollondilly and Campbelltown Councils.	None required	--
B55(c)	(c) include details of all transport routes and traffic types to be used for development-related traffic;	Haulage routes specified in TMP (Section 4.8)	None required	--
B55(d)	(d) describe the processes in place for the control of truck movements entering and exiting the site;	Site access procedures and operations specified in TMP (Sections 4.1 & 4.2)	None required	--
B55(e)	(e) include details of the measures to be implemented to minimise traffic safety issues and disruption to local road users;	Site safety and operational measures specified in TMP (Sections 4 & 5)	None required	--
B55(f)	(f) include a Drivers' Code of Conduct that includes procedures to ensure that drivers: (i) adhere to posted speed limits or other required travelling speeds; (ii) adhere to designated transport routes; and (iii) implement safe and quiet driving practices;	Drivers' Code of Conduct specified in TMP (Section 5)	None required	--
B55(g)	(g) describe the measures to be put in place to ensure compliance with the Drivers' Code of Conduct;	The TMP (Section 1.8) requires a Road Safety and Condition Audit to be undertaken within 12 months of commencing quarrying operations in Stage 8 Area.	Benedict to undertake Road Safety & Condition Audit & road structural condition assessment by 27/11/24 [also refer Condition B49(a)] and document results in next Annual Report	Low
B55(h)	(h) describe measures to minimise the transmission of dust and tracking of material onto the surface of public roads from vehicles exiting the site; and	Dust control measures specified in TMP (Section 4.7). Auditor observed implementation of these measures (refer photos in Appendix F)	None required	--

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No.	Condition	Observation	Recommendation	Risk Level
B55(i)	(i) describe measures to be put in place to ensure the off-road haul truck complies with its operating conditions.	Measures controlling off-road haul trucks specified in TMP (Sections 4.2, 5.3 & 5.8). Auditor observed implementation of these measures (refer photos in Appendix F)	None required	--
B56	The Applicant must not commence Quarrying Operations in the Stage 8 Area until the Traffic Management Plan is approved by the Planning Secretary.	DPHI approved TMP (Version 7) on issued 23/03/22. The Benedict 2023 Annual Review advised that Stage 8 quarrying operations commenced on 4/09/23. DPHI approved version 8 of the plan on 13/09/24.	None required	--
B57	The Applicant must implement the Traffic Management Plan as approved by the Planning Secretary.	Available data indicates general compliance with approved TMP.	Continue to implement approved TMP	Negligible
	HERITAGE			
	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.	Benedict advised that heritage operating conditions have not been triggered.	None required	--
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.	Benedict advised that heritage operating conditions have not been triggered.	None required	--
B60(a)	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;	Benedict advised that heritage operating conditions have not been triggered.	None required	--
B60(b)	(b) a 10 metre buffer area around the object or place must be cordoned off; and	Benedict advised that heritage operating conditions have not been triggered.	None required	--
B60(c)	(c) Heritage NSW must be contacted immediately.	Benedict advised that heritage operating conditions have not been triggered.	None required	--
B61(a)	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	Benedict advised that heritage operating conditions have not been triggered.	None required	--
B61(b)	(b) an Aboriginal Heritage Impact Permit is obtained under section 90 of the National Parks and Wildlife Act 1974, 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.	Benedict advised that heritage operating conditions have not been triggered.	None required	--
	Aboriginal Cultural Heritage Management Plan			

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
B61(a)	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	Benedict advised that heritage operating conditions have not been triggered.	Continue to implement approved ACHMP	Negligible
B62(b)	(b) be prepared in consultation with Heritage NSW and Registered Aboriginal Parties;	ACHMP (Sections 1.6 & 3) advised that it was prepared in consultation with Heritage NSW and the Aboriginal community.	None required	--
B62(c)	(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; (ii) protect, monitor and manage Aboriginal objects and Aboriginal places; (iii) protect Aboriginal objects and Aboriginal places located outside the approved disturbance area from impacts of the development; (iv) manage any new Aboriginal objects or Aboriginal places discovered during the life of the development; (v) maintain and manage reasonable access for relevant Aboriginal stakeholders to Aboriginal objects and Aboriginal places (outside of the approved disturbance area); and (vi) facilitate ongoing consultation and involvement of Registered Aboriginal Parties in the conservation and management of Aboriginal cultural heritage on the site.	Measures to be implemented within the Stage 8 area were specified in the ACHMP (Section 5). The ACHMP (version 5) was approved by DPHI on 23/09/24.	None required	--
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.	ACHMP (version 3) approved by DPHI on 25/03/22. Current ACHMP (version 5) dated 28/08/24 approved by DPHI on 23/09/24. The Benedict 2023 Annual Review advised that Stage 8 quarrying operations commenced on 4/09/23.	None required	--
B64	The Applicant must implement the Aboriginal Cultural Heritage Management Plan approved by the Planning Secretary.	Available data indicates general compliance with approved ACHMP.	Continue to implement approved ACHMP	Negligible
	BIODIVERSITY AND REHABILITATION			
	Construction of Linear Infrastructure			
B65(a)	Prior to commencing construction of any linear infrastructure required for the carrying out of the development (including access roads and haul roads), the Applicant must: (a) determine the final alignment of the linear infrastructure by survey;	Benedict advised that Condition B65 not triggered		
B65(b)	(b) minimise the environmental impacts of the alignment of this infrastructure, where practicable;			

No.	Condition	Observation	Recommendation	Risk Level
B65(c)	(c) map the final vegetation clearance, excluding any vegetation within the approved disturbance area as identified under condition A22 of Schedule 2;	because existing tracks are being used, and no additional clearing has been required except for weed control (lantanna). Auditor observed this was the case (refer photos in Appendix F)	Implement approval conditions when Condition 65 is triggered	Negligible
B65(d)	(d) submit a survey plan of the disturbance boundaries for linear infrastructure and their respective GPS coordinates to the Planning Secretary; and			
B65(e)	(e) identify relevant ecosystem and species credits required to compensate for the clearance identified in subparagraph (c), to the satisfaction of BCD.			
B66	The Applicant must retire the ecosystem and species credits identified under condition B65(e) in accordance with the Biodiversity Offsets Scheme of the BC Act, to the satisfaction of the BCT.	Benedict advised that Condition B65 not triggered because no additional clearing has been required	Work required when Condition 65 triggered	Negligible
	Biodiversity Offset Strategy			
B67	Prior to commencing Quarrying Operations in the Stage 8 Area, or other timeframe agreed by the Planning Secretary, the Applicant must make suitable arrangements for the long-term protection of the Restoration Area as described in the documents listed in condition A7(c) of Schedule 2, to the satisfaction of the Planning Secretary.	Refer feedback to Condition B51	Maintain compliant operations	Negligible
B68	If the Restoration Area does not meet the listing criteria of the targeted communities or the completion criteria in Table 6 in Appendix 7, within the timeframes established in the Biodiversity and Rehabilitation Management Plan, then the Applicant must retire the relevant deficient biodiversity credits in accordance with the Biodiversity Offsets Scheme of the BC Act, to the satisfaction of the BCT.	Noted	Maintain compliant operations	Negligible
B69(a)	The Applicant may satisfy condition B67 of Schedule 2 by establishing a positive covenant on title under section 88E of the NSW Conveyancing Act 1919. If the Applicant seeks to establish a positive covenant on title: (a) the positive covenant must stipulate that the Applicant will manage the Restoration Area and all rehabilitated Substages in accordance with the Biodiversity and Rehabilitation Management Plan required under condition B73 of Schedule 2; &	Noted	Maintain compliant operations	Negligible
B69(b)	(b) the Applicant must establish a trust with sufficient funds (calculated in accordance with the total fund deposit requirements for a biodiversity stewardship site in accordance with BC Act) to provide for the ongoing management of the Restoration Area and all rehabilitated Substages in accordance with the Biodiversity and Rehabilitation Management Plan, to the satisfaction of the Planning Secretary.	Refer feedback to Condition B51	Maintain compliant operations	Negligible
	Rehabilitation Objectives			

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No.	Condition	Observation	Recommendation	Risk Level
B70	The Applicant must rehabilitate all areas impacted by the Stage 8 Operations to the satisfaction of the Planning Secretary. This rehabilitation must be consistent with the final rehabilitation plans submitted to the Planning Secretary under condition A11 of Schedule 2 and must comply with the objectives in Table 4, to the satisfaction of the Planning Secretary. Refer Table 4: Rehabilitation objectives	Work in progress with rehabilitation work not yet completed in any part of Stage 8. Work involves planting, seeding, hydromulching, creating landforms & weed control. Auditor observed this work was occurring. Further information provided in Section 4.6	Maintain compliant operations	Negligible
	Progressive Rehabilitation			
B71	The Applicant must rehabilitate the Substages progressively, to the satisfaction of the Planning Secretary.	Work in progress with rehabilitation work not yet completed in any part of Stage 8. Ian to inspect site and verify	Benedict to document compliance with this condition in Annual Reports. The report needs to among other things document: • compliance with recommendation provided in the previous year SRRAPR; • update the restoration area 1 management strategy (Attachment D, Annual Report); • compliance with recommendations given in the ecological monitoring report (Attachment E, Annual Report); • nest box installation & monitoring records; • compliance with planting guidelines and plant species (Attachment F, Annual Report); and • recommendations in BRMP monitoring report (Attachment, Annual Report).	Low
B72(a)	Unless otherwise agreed by the Planning Secretary, the Applicant must ensure that: (a) no more than two Substages are opened, excavated or worked at any one time without the written approval of the Planning Secretary;			
B72(b)	(b) the active extraction area in all combined Substages does not exceed 0.33 hectares at any one time;			
B72(c)	(c) the area of exposed ground at any one time is minimised as far as reasonable and feasible, for the life of the development;			
B72(d)	(d) Quarrying Operations do not progress from one phase of the development to another unless the progressive rehabilitation performance criteria in the Biodiversity and Rehabilitation Management Plan have been met (with the exception of in the active extraction area) for the previous phase (see condition B73(d) of Schedule 2); and			
B72(e)	(e) the post-extraction batter along the landward edge of each Substage does not exceed a maximum slope of 1:1 (V:H) or the natural underlying sandstone profile.			
	Biodiversity and Rehabilitation Management Plan			
B73(a)	The Applicant must prepare a Biodiversity and Rehabilitation Management Plan for the development to the satisfaction of the Planning Secretary. This plan must: (a) be prepared by suitably qualified and experienced person/s;	The BRMP was prepared by EMM. Version 3 dated 17/01/22 was approved by DPHI on 3/03/22. The current version 5 dated 15/09/24 was approved by DPHI on 20/09/24.	The BRMP to be subject to ongoing review and continual improvement, as recommended by the BRMP (Section 8.10)	Negligible
B73(b)	(b) be prepared in consultation with BCD and Council;	BRMP (Section 1.15) advised it was prepared in consultation with Biodiversity Conservation Division and Wollondilly Shire Council.	None required	--
B73(c)	(c) describe the short, medium, and long-term measures to be undertaken to: (i) ensure compliance with the biodiversity objectives outlined in Table 6 in Appendix 7; (ii) ensure compliance with the rehabilitation objectives outlined in Table 4 of Schedule 2; and (iii) prevent impacts on aquatic biodiversity, including through the stabilisation of riverbanks and the prevention of sediment-laden runoff;	BRMP (Section 7) describes the Stage 8 area rehabilitation and restoration measures for the Nepean River Buffer Zone and lower riverbank, the extraction area, the restoration area, weed control areas. Fauna habitat enhancement measures and the work schedule were also described.	None required	--

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No.	Condition	Observation	Recommendation	Risk Level
B73(d)	(d) include detailed progressive rehabilitation performance criteria that must be met for each phase of the development before extraction can progress into subsequent phases;	BRMP (Sections 8.1-8.3) provided performance indicators and completion criteria.	None required	--
B73(e)	(e) include detailed performance and completion criteria for the Restoration Area and the final rehabilitation of the Stage 8 Area (including timeframes for the achievement of the listing criteria of the targeted communities) based on the performance and completion criteria in Table 6 in Appendix 7;			
B73(f)	(f) include a program to monitor, independently audit and report on progress against the criteria in subparagraphs (d) and (e), including reporting in the Annual Review;	BRMP (Sections 8.4-8.10) provided details on: Rehabilitation and restoration monitoring; Frequency of monitoring; Observations and inspections; Corrective actions; Reporting; Independent audits; and, Docment review.	None required	--
B73(g)	(g) include an evaluation of the performance of the Restoration Area and the progressive rehabilitation of the Stage 8 Area against the performance and completion criteria required under paragraph (d) above;	BRMP (Section 8.4) requires ongoing monitoring of the rehabilitation and restoration work. BRMP (Section 8.8.2) requires preparation of annual progress reports for the site rehabilitation and restoration program (SRRAPR). The SRRAPR is to summarise: The measures taken in the preceding 12 months; Monitoring results; Progress against the detailed performance and completion criteria; Report on the effectiveness of the measures; Identify trends based on previous report results; Make progressive improvements; and, Describe measures to be taken in next 12 months.	None required	--
B73(h)	(h) include triggers for remedial action (including additional planting or seeding), where the performance or completion criteria required under (d) and (e) above are not met;	Triggers provided by the BRMP for: Flood events (Section 5.4.3); Weed management (Section 8.4.2); Rehabilitation and restoration (Section 8.7).	None required	--
B73(i)	(i) describe management measures to ensure that Quarrying Operations do not encroach on the Nepean River Buffer Zone and Exclusion Areas;	Refer BRMP (Section 7.1).	None required	--

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No.	Condition	Observation	Recommendation	Risk Level
B73(j)	(j) include a detailed description of the measures to be implemented to: (i) demonstrate compliance with conditions B76 and B78; (ii) manage the collection and propagation of seed; (iii) trial methods of extraction of seed resources on site and implement the most effective method of seed recovery; (iv) minimise impacts on tree hollows and termite mounds where reasonable and feasible; (v) minimise impacts on fauna, including undertaking pre-clearance surveys and supervision (by an appropriately qualified person) of the felling of habitat trees; (vi) protect native vegetation and fauna habitat outside the approved disturbance area, including in the Restoration Area; (vii) implement the Stage 8 Area Weed Control Strategy in the Amended Project Summary, except where varied by condition A18 of Schedule 2; (viii) control feral pests; (ix) control erosion; (x) control unrestricted access; (xi) manage bushfire hazards; (xii) rehabilitate any areas of the Nepean River that are materially harmed by the development (including indirect or incidental impacts); and (xiii) progressively rehabilitate the site and reasonably and feasibly minimise disturbance areas; and (xiv) ensure the successful rehabilitation and protection of Stages 6 and 7 until the completion of Quarrying Operations in the Stage 8 Area;	Measures provided in BRMP for: (i) Section 7.5; (ii) Section 5.4.3; (iii) Section 5.3.7; (iv) Section 7.2; (v) Section 5.2.1; (vi) Section 5.2; (vii) Sections 4.5 & 5.5; (viii) Sections 4.6 & 5.6; (ix) Sections 4.3 & 5.4; (x) Sections 6.2.3i & 7.2; (xi) Section 4.7; (xii) Sections 4.4 & 5.4.3; (xiii) Section 1.9; (xiv) Sections 6.2 & 6.4	None required	--
B73(k)	(k) include an annual program to monitor and report on: (i) the effectiveness of the measures required under (j) above; (ii) progress against the detailed performance and completion criteria required under (d) and (d) above; (iii) any progressive improvements that could be implemented to improve biodiversity outcomes; and (iv) any additional or remedial actions required over the next 12 months;	Refer BRMP (Section 8.4). The Benedict 2023 Annual Review included a SRRAPR for the 2023 calendar year. The SRRAPR provided monitor-ing results for: Landform establishment, stability and growth medium; Biodiversity management measures; Weed monitoring; Nest box and woody debris.The SRRAPR summarised: The measures taken in the preceding 12 months; Monitoring results; Progress against the detailed performance and completion criteria; Report on the effectiveness of the measures; Trends to be identified when second report prepared; and, Described measures to be taken in next 12 months.	Ongoing monitoring to be documented in annual SRRAPRs prepared in accordance with the BRMP. Address review comments provided by DPHI in 2/08/24 letter on Benedict 2023 Annual Review report.	Low
B73(l)	(l) identify the potential risks to the successful rehabilitation of the Stage 8 Area, particularly where rehabilitation is damaged or delayed by flooding, and include a detailed description of the contingency measures to be implemented to mitigate against these risks; and	BRMP (Section 4) described the rehabilitation and restoration riskspposed by vegetation, seed availability, water and sediment, potential impacts to aquatic biodiversity, weeds, pests and bushfire.	Risks need ongoing management by implem-enting the BRMP.	Negligible
B73(m)	(m) include details of who would be responsible for monitoring, reviewing, and implementing the plan.	BRMP (Section 5.1.1) advises that the Quarry Manager is responsible for implementation of the BRMP.	None required	--

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No.	Condition	Observation	Recommendation	Risk Level
B74	Subject to condition A29, the Applicant must not commence Quarrying Operations in the Stage 8 Area until the Biodiversity and Rehabilitation Management Plan is approved by the Planning Secretary.	The BRMP was prepared by EMM. Version 3 dated 17/01/22 was approved by DPHI on 3/03/22. The current version 5 dated 15/09/24 was approved by DPHI on 20/09/24. The Benedict 2023 Annual Review advised that Stage 8 quarrying operations commenced on 4/09/23.	None required	--
B75	The Applicant must implement the Biodiversity and Rehabilitation Management Plan as approved by the Planning Secretary.	Available data indicates general compliance with approved BRMP.	Continue to implement approved BRMP	Negligible
B76	The Applicant must place or create a minimum of 106 nest boxes or tree hollows within the Restoration Area within 12 months of commencing Quarrying Operations in the Stage 8 Area.	The Benedict 2023 SRRAPR (Section 5 & Attachment G) shows that between April and December 2023, 35 nest boxes were installed in stages 8A-8C.	Benedict need to install the remaining 71 next boxes by 4/09/24.	Low
B77	The Applicant must, to the greatest extent practicable, maximise the salvage of resources within the Stage 8 Area, including retention of: (a) nut and seed resources from native trees; and (b) leaf and small branch material for mulching, for beneficial reuse on the site, including in rehabilitated Substages and in the Restoration Area.	Benedict advised that logs and wood debris is being placed in rehab areas. Branches are laid on ground for a few months for seeds to drop, with the branches then removed to avoid flood issues. Auditor observed this work in progress (refer photos in Appendix F)	Maintain compliant operations	Negligible
B78(a)	Following the conclusion of extraction in each Substage, the Applicant must actively place logs and woody debris salvaged from the approved disturbance area within the completed Substage at the following ratios: (a) logs and woody debris at least 10 cm in diameter and greater than 0.5 m in length are to be placed in a configuration that reflects natural systems, such that there is overall at least 400 m of this woody debris per hectare for all completed Substages; &	Refer feedback to Condition B77	Maintain compliant operations	Negligible
B78(b)	(b) large woody debris at least 50 cm in diameter and greater than 0.5 m in length, such that there is overall at least 100 m of this large woody debris per hectare for all completed Substages.			
	Disposal of Vegetation (Stage 8)			
B79	The Applicant may undertake timber milling in Stage 8, provided this timber milling occurs outside of the Nepean River Buffer Zone and the Exclusion Areas, and that the Applicant can demonstrate ongoing compliance with condition B78 of this Schedule.	Benedict advised this Condition has not been triggered. Auditor observed this was the case (refer photos Appendix F)	Maintain compliant operations	Negligible
	Additional Rehabilitation Requirements for Stages 6 and 7			
B80	The Applicant must rehabilitate 1.22 ha within Stage 6 and 3.44 ha within Stage 7 of the development in accordance with the objectives and the performance and completion criteria in Table 6 in Appendix 6.	Benedict advises that this is ongoing but has been inhibited by flooding. Auditor observed this was the case (refer photos Appendix F)	Rehabilitation requirements for Stages 6 and 7 ongoing and need to be completed in accordance with the Consent requirements. Documentation to be included in next Annual Report	Low

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No.	Condition	Observation	Recommendation	Risk Level
B81(a)	By the end of December 2020, or other timing as agreed by the Planning Secretary, the Applicant must submit a Vegetation Management Plan for Stages 6 and 7 to the Planning Secretary for approval. This plan must: (a) satisfy the relevant requirements of condition 13 of Schedule 1;	BRMP (Section 1.15) advises that on 20/07/21 approval was received from DPIE to combine the Vegetation Management Plan with the BRMP. Version 3 of the BRMP dated 17/01/22 was approved by DPHI on 3/03/22. The current version 5 dated 15/09/24 was approved by DPHI on	None required	--
B81(b)	(b) clearly define the extent and scope of Stage 6 vegetated lands;	Refer Figures 2.3 and 6.1, BRMP	None required	--
B81(c)	(c) clearly define the extent and scope of Stage 7 vegetated lands and identifies that the diversity of species established via retention of current species, tubestock planting or direct seeding is to be raised to deliver the native plant species diversity identified in Table 5 in Appendix 6;	Refer Section 6 & Figures 2.3 & 6.2, BRMP	None required	--
B81(d)	(d) establish baseline data for the existing habitat in the Stage 6 and 7 areas;	Refer Section 6.2.2, BRMP	None required	--
B81(e)	(e) describe how the Stage 6 and 7 vegetated lands would be managed and how habitat would be established and retained; and	Refer Section 6.2.3, BRMP	None required	--
B81(f)	(f) include detailed biodiversity objectives and performance and completion criteria for Stages 6 and 7 of the development, based on the general objectives and performance and completion criteria in Table 5 in Appendix 6, to the satisfaction of the Planning Secretary	Refer Section 8.2, BRMP	None required	--
B82	The Applicant must implement the Vegetation Management Plan for Stages 6 and 7 to the satisfaction of the Planning Secretary.	Available data indicates general compliance with approved BRMP.	Continue to implement approved BRMP	Negligible
	Rehabilitation Bond			
B83	Within 6 months of the approval of the Biodiversity and Rehabilitation Management Plan, the Applicant must lodge a Rehabilitation Bond with the Department to ensure that rehabilitation of the Stage 8 Area is implemented in accordance with the performance and completion criteria set out in the plan and the relevant conditions in Schedule 2 of this consent. The sum of the bond must be an amount agreed by the Planning Secretary and determined by: (a) calculating the cost of rehabilitating all disturbed areas of the site at third party rates (other than land acquisition costs), taking into account the likely surface disturbance over the next 3 years of Quarrying Operations; and (b) employing a suitably qualified, independent and experienced person to verify the calculated costs.	The BRMP (Section 8.2) advises that the bond lodged with DPHI in August 2022 for $268,092	None required	--
B84	The calculation of the Rehabilitation Bond must be submitted to the Department for approval at least 2 months prior to the lodgement of the	BRMP (Section 8.2) provides procedures for calculating the bond	None required	--

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No.	Condition	Observation	Recommendation	Risk Level
B85	The Rehabilitation Bond must be reviewed and if required, an updated bond must be lodged with the Department within 3 months following: (a) any update or revision to the Biodiversity and Rehabilitation Management Plan; (b) the completion of an Independent Environmental Audit in which recommendations relating to the implementation of the Biodiversity and Rehabilitation Management Plan have been made; or (c) in response to a request by the Planning Secretary.	No actions have been triggered requiring a review of the rehabilitation bond	None required	--
B86	If rehabilitation is completed generally in accordance with the relevant performance and completion criteria, to the satisfaction of the Planning Secretary, the Planning Secretary will release the bond.	Rehabilitation ongoing so bond not ready to be released.	None required	--
B87	If rehabilitation is not completed generally in accordance with the relevant performance and completion criteria, the Planning Secretary will call in all, or part of, the bond, and arrange for the completion of the relevant works.	Rehabilitation ongoing so bond not ready to be released.	None required	--
B88	If the Applicant establishes a positive covenant on title under section 88E of the NSW Conveyancing Act 1919 under condition B69, then the Planning Secretary may waive the requirement for all or part of the Rehabilitation Bond required under conditions B83 to B87.	Rehabilitation ongoing so bond not ready to be released.	None required	--
	Weed Management			
B89	The Applicant must manage noxious weeds on the site in accordance with the Biodiversity and Rehabilitation Management Plan, and subject to the restrictions in condition A18 of this Schedule, to the satisfaction of the Planning Secretary.	The Benedict (August 2024) SRRAPR (Section 4) provided a weed monitoring report. The report advised that progress on weed performance & completion criteria met for lantana & privet control in Stage 6 but not in stages 7 & 8. Measures to be taken in 2024 include ongoing weed management in Restoration Area 1. Completing substage 8A and soon to be completed Substage 8B will be a priority.	Weed management in 2024 needs to address shortcomings in 2023 and ensure the performance and completion criteria are met in 2024.	Low
	VISUAL			
B90(a)	The Applicant must: (a) take all reasonable steps to minimise the visual and off-site lighting impacts of the development, including potential lighting impacts on the Hume Highway;	No complaints recorded in Benedict 2023 Annual Review. No complaints received from local Councils, EPA & TfNSW (refer Section 4.7)	Maintain compliant operations	Negligible
B90(b)	(b) ensure that the visual appearance of all new structures, facilities or works (including paint colours and specifications) is aimed at blending as far as possible with the surrounding landscape; and			
B90(c)	(c) take all reasonable steps to: (i) shield views of Quarrying Operations and associated equipment from users of public roads and at privately-owned residences; and (ii) direct any on-site lighting downwards to avoid lighting impacts on the Hume Highway.			
	WASTE			

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
B91(a)	The Applicant must: (a) manage on-site sewage treatment and disposal in accordance with the requirements of an applicable EPL, and to the satisfaction of EPA and Council;	No complaints recorded in Benedict 2023 Annual Review. No complaints received from local Councils, EPA & TfNSW (refer Section 4.7). The Benedict 2023 Annual Review (Section 5) advised the Stage 8 development generates little waste by-products. Clearing of land generates useful rehabilitation vegetation which is stored and reused. Weed residues (e.g. Lantana) is buried in the extraction holes. Other debris that might occasionally arrive onsite via elevated river levels would be taken to the site rubbish bin and removed by the regular contractor service. Materials received on-site reported to comprise compost / foul manure, excavation sand & some recovered fines from Lake Chipping Norton Facility. All imported materials are weighed on the weighbridge & data included in the EPA Waste & Resource Recovery Portal (WARRP).	Future Benedict Annual Reports need to provide a log of all materials imported to the Menange Quarry so that the suitability of imported materials can be reviewed and audited	Low
B91(b)	(b) minimise the waste generated by the development;			
B91(c)	(c) ensure that the waste generated by the development is appropriately stored, handled, and disposed of; and			
B91(d)	(d) report on waste minimisation and management in the Annual Review.			
B92	Except as expressly permitted in an applicable EPL, specific resource recovery order or exemption under the Protection of the Environment Operations (Waste) Regulation 2014, the Applicant must not receive waste at the site for storage, treatment, processing, reprocessing or disposal.			
	LIQUID STORAGE			
B93	The Applicant must ensure that all tanks and similar storage facilities (other than for water) are protected by appropriate bunding or other containment, in accordance with the relevant Australian Standards.	Diesel AST self bunding and inspected by Auditor (refer photos in Appendix F), together with workshop	Maintain compliant operations	Negligible
	DANGEROUS GOODS			
B94	The Applicant must ensure that the storage, handling, and transport of dangerous goods is done in accordance with the latest version of the Australian Standards, particularly AS 1940-2004 *The storage and handling of flammable and combustible liquids* (Standards Australia, 2004) and AS/NZS 1596:2014 *The storage and handling of LP Gas* (Standards Australia, 2014), and the Australian Dangerous Goods Code.	Refer feedback to Condition B93	Maintain compliant operations	Negligible
	BUSHFIRE MANAGEMENT			
B95	The Applicant must: (a) ensure that the development: (i) provides for asset protection in accordance with the relevant requirements in the Planning for Bushfire Protection (RFS, 2006) guideline; and (ii) ensure that there is suitable equipment to respond to any fires on the site; & (b) assist the RFS and emergency services to the extent practicable if there is a fire in the vicinity of the site.	Benedict advised that fire training conducted annually for all site staff as part of PIRMP. Benedict report no bushfires in recent times. No feedback from Fire & Rescue. Auditor observed no physical evidence of recent bushfires (refer photos in Appendix F)	Maintain compliant operations	Negligible
	PART C: ADDITIONAL PROCEDURES			
	NOTIFICATION OF EXCEEDANCES			

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
C1	As soon as practicable and no longer than 7 days after obtaining monitoring results showing an exceedance of any noise or air quality criterion in PART B of Schedule 2 following the date of commencement of Quarrying Operations in the Stage 8 Area, the Applicant must provide details of the exceedance to any affected landowners/tenants if the Applicant has not otherwise reached an agreement to exceed the relevant criteria with the affected landowner pursuant to condition B5 or B12. For any exceedance of any air quality criterion in PART B of this consent, the Applicant must also provide to any affected land owners and tenants a copy of the fact sheet entitled "Mine Dust and You" (NSW Health, 2017).	Noise and air quality monitoring measured no exceedances. Condition not triggered.	Maintain compliant operations	Negligible
	INDEPENDENT REVIEW			
C2	If, at any time following the date of commencement of Quarrying Operations in the Stage 8 Area, a landowner considers the development to be exceeding any noise or air quality criterion in PART B of Schedule 2, they may ask the Planning Secretary in writing for an independent review of the impacts of the development on their land.	Noise and air quality monitoring measured no exceedances. Condition not triggered.	Maintain compliant operations	Negligible
C3	If the Planning Secretary is not satisfied that an independent review is warranted, the Planning Secretary will notify the landowner in writing of that decision, and the reasons for that decision, within 21 days of the request for a review.	Condition not triggered.	Maintain compliant operations	Negligible
C4(a)	If the Planning Secretary is satisfied that an independent review is warranted, then within 3 months of the Planning Secretary's decision, or as otherwise agreed by the Planning Secretary and the landowner, the Applicant must: (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Planning Secretary, to: (i) consult with the landowner to determine their concerns; (ii) conduct monitoring to determine whether the development is complying with the relevant criteria in PART B of Schedule 2; and (iii) if the development is not complying with that criteria, identify measures that could be implemented to ensure compliance with the relevant criteria; and	Condition not triggered.	Maintain compliant operations	Negligible
C4(b)	(b) give the Planning Secretary and landowner a copy of the independent review; and			
C4(c)	(c) comply with any written requests made by the Planning Secretary to implement any findings of the review.			
PART D: ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING				
	ENVIRONMENTAL MANAGEMENT			
	Environmental Management Strategy			

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
D1(a)	An Environmental Management Strategy must be prepared for the development to the satisfaction of the Planning Secretary. This strategy must: (a) provide the strategic framework for environmental management of the development;	Version 2 of the EMS dated 17/06/21 was approved by DPHI on 21/06/21. The current version 5 dated 28/08/24 was approved by DPHI on 13/09/24.	Periodically review EMSP as recommended in Section 9.2 of the EMS.	Negligible
D1(b)	(b) identify the statutory approvals that apply to the development;	Refer Section 2, EMS	None required	--
D1(c)	(c) set out the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development;	Refer Section 3.2, EMS	None required	--
D1(d)	(d) set out the procedures to be implemented to: (i) keep the local community and relevant agencies informed about the operation and environmental performance of the development; (ii) receive record, handle and respond to complaints; (iii) resolve any disputes that may arise during the course of the development; (iv) respond to any non-compliance and any incident; (v) respond to emergencies; and	Refer Sections 3-8, EMS	None required	--
D1(e)	(e) include: (i) references to any strategies, plans and programs approved under the conditions of this consent; and (ii) a clear plan depicting all the monitoring to be carried out under the conditions of this consent.	Refer Sections 3.1 & 6.2, EMS	None required	--
D2	The Applicant must not commence Quarrying Operations in the Stage 8 Area until the Environmental Management Strategy is approved by the Planning Secretary.	Version 2 of the EMS dated 17/06/21 was approved by DPHI on 21/06/21. The current version 5 dated 28/08/24 was approved by DPHI on 13/09/24. The Benedict 2023 Annual Review advised that Stage 8 quarrying operations commenced on 4/09/23.	None required	--
D3	The Applicant must implement the Environmental Management Strategy as approved by the Planning Secretary.	Available data indicates general compliance with approved EMS.	Continue to implement approved EMS	Negligible
	Management Plan Requirements			
D4(a)	Management plans required under this Schedule must be prepared in accordance with relevant guidelines, and include: (a) a summary of relevant background or baseline data;	Available data indicates compliance, with all plans approved by DPHI.	None required	--
D4(b)	(b) details of: (i) the relevant statutory requirements (including any relevant approval, licence or lease conditions); (ii) any relevant limits or performance measures and criteria; and (iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;	Available data indicates compliance, with all plans approved by DPHI.	None required	--
D4(c)	(c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Available data indicates compliance, with all plans approved by DPHI.	None required	--

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
D4(d)	(d) a program to monitor and report on the: (i) impacts and environmental performance of the development; and (ii) effectiveness of the management measures set out pursuant to condition D4(c);	Available data indicates compliance, with all plans approved by DPHI.	None required	--
D4(e)	(e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Available data indicates compliance, with all plans approved by DPHI.	None required	--
D4(f)	(f) a program to investigate and implement ways to improve the environmental performance of the development over time;	Available data indicates compliance, with all plans approved by DPHI.	None required	--
D4(g)	(g) a protocol for managing and reporting any: (i) incident, non-compliance or exceedance of the impact assessment criteria or performance criteria; (ii) complaint; or (iii) failure to comply with statutory requirements; and	Available data indicates compliance, with all plans approved by DPHI.	None required	--
D4(h)	(h) a protocol for periodic review of the plan. *Note: The Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.*	Available data indicates compliance, with all plans approved by DPHI.	None required	--
	REVISION OF STRATEGIES, PLANS AND PROGRAMS			
D5	Within three months of: (a) the submission of an incident report under condition D7; (b) the submission of an Annual Review under condition D9; (c) the submission of an Independent Environmental Audit under condition D11; (d) the approval of any modification to the conditions of this consent; or (e) the issue of a direction of the Planning Secretary under condition A8 which requires a review, the suitability of existing strategies, plans and programs required under this consent must be reviewed by the Applicant.	Available data indicate existing strategies, plans and programs are regularly reviewed and updated to the satisfaction of DPHI	Annual reviews required by Condition D5	Negligible
D6	If necessary, to either improve the environmental performance of the development, cater for a modification or comply with a direction, the strategies, plans and programs required under this consent must be revised, to the satisfaction of the Planning Secretary and submitted to the Planning Secretary for approval within six weeks of the review. *Note: This is to ensure strategies, plans and programs are updated on a regular basis and to incorporate any recommended measures to improve the environmental performance of the development.*	Available data indicate existing strategies, plans and programs are regularly reviewed and updated to the satisfaction of DPHI	Annual reviews required by Condition D5	Negligible
	REPORTING AND AUDITING			
	Incident Notification			
D7	The Applicant must immediately notify the Department and any other relevant agencies immediately after it becomes aware of an incident. The notification must be in writing via the Major Projects Website and identify the development (including the development application number and name) and set out the location and nature of the incident.	Available data indicate this Condition has not been triggered during the audit period.	Maintain compliant operations	Negligible
	Non-Compliance Notification			

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
D8	Within seven days of becoming aware of a non-compliance, the Applicant must notify the Department of the noncompliance. The notification must be in writing via the Major Projects Website and identify the development (including the development application number and name), set out the condition of this consent that the development is noncompliant with, the way in which it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance. *Note: A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.*	Available data indicate this Condition has not been triggered during the audit period.	Maintain compliant operations	Negligible
	Annual Review			
D9(a)	By the end of March in each year after the commencement of Quarrying Operations in the Stage 8 Area, or other timeframe agreed by the Planning Secretary, a report must be submitted to the Department reviewing the environmental performance of the development, to the satisfaction of the Planning Secretary. This review must: (a) describe the development (including any rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year;	First annual review report submitted by Benedict 22/04/24 and approved by DPHI in 2/08/24 letter. In their letter, DPHI recommended a copy of annual review be uploaded to Benedict website. Audit confirmed compliance with this instruction. DPHI also made recommendation for future Annual Review reports.	Future annual reports need to address recommendation made by DPHI in their 2/08/24 letter.	Low
D9(b)	(b) include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, including a comparison of these results against the: (i) relevant statutory requirements, limits or performance measures/criteria; (ii) requirements of any plan or program required under this consent; (iii) monitoring results of previous years; and (iv) relevant predictions in the documents listed condition A7(c).	Monitoring data provided by 2023 annual report covered noise compliance, on-site air quality, ambient air quality, groundwater, site complaints. Annual report reviewed and assessed monitoring data and complaints records. General compliance achieved. DPHI approved report.	Ongoing monitoring to comply with consent requirements. Future annual reports need to address recommendation made by DPHI in their 2/08/24 letter.	Low
D9(c)	(c) identify any non-compliance or incident which occurred in the previous calendar year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence;	The 2023 annual report (Section 4) advised that there were no significant incidents or lost time through injury in 2023. Benedict has their own OH&S system with safety reporting. No lost time OH&S incidents during audit period	Maintain compliant operations	Negligible
D9(d)	(d) evaluate and report on: (i) the effectiveness of the noise and air quality management systems; and (ii) compliance with the performance measures, criteria and operating conditions in this consent, as they relate to the Stage 8 Area;	Annual report reviewed and assessed monitoring data and complaints records. General compliance achieved	Maintain compliant operations	Negligible
D9(e)	(e) identify any trends in the monitoring data over the life of the development	The 2023 annual report was the first prepared for Stage 8, so no trends could be identified at that time.	Future annual reports to identify trends in monitoring data.	Low

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
D9(f)	(f) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and	The 2023 annual report (Section 7) advised that it was too early in the Stage 8 work to identify any discrepancies between the predicted and actual impacts of the development and analyse the potential cause of any significant discrepancies.	Future annual reports need to identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies.	Low
D9(g)	(g) describe what measures will be implemented over the next calendar year to improve the environmental performance of the development.	The 2023 annual report (Section 8) advised that proposed measures included ongoing nest box roll out (33% installed currently), infill planting and weed management, staged rehabilitation, modified mulching strategy, modified woody debris placement.	Future annual reports to describe what measures will be implemented over the next calendar year to improve the environmental performance of the development.	Low
D10	Copies of the Annual Review must be submitted to Council and made available to any interested person upon request.	Benedict advised that copies of the 2023 Annual Review were sent to Council, with an acknowledgment email received 16/08/2024	Maintain compliant operations	Negligible
	Independent Environmental Audit			
D11(a)	Within one year of the commencement of Quarrying Operations in the Stage 8 Area, and every three years after, unless the Planning Secretary directs otherwise, the Applicant must commission and pay the full cost of an Independent Environmental Audit of the development. The audit must: (a) be led and conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Planning Secretary;	Auditor commissioned on 04/09/2024	None required	--
D11(b)	(b) be carried out in consultation with the relevant agencies;	The Auditor consulted with relevant agencies (Section 4.7)	None required	--
D11(c)	(c) assess the environmental performance of the development and whether it is complying with the relevant requirements in this consent, water licences and mining leases for the development (including any assessment, strategy, plan or program required under these approvals);	The Audit report provided the required assessment (Section 4)	None required	--
D11(d)	(d) review the adequacy of any approved strategy, plan or program required under the abovementioned approvals and this consent;	The Audit report provided the required assessment (Section 4)	None required	--
D11(e)	(e) recommend appropriate measures or actions to improve the environmental performance of the development and any assessment, strategy, plan or program required under the abovementioned approvals and	The Audit report provided the required assessment (Section 4).	None required	--
D11(f)	(f) be conducted and reported to the satisfaction of the Planning Secretary.	The Audit report met DPHI guidance	None required	--

AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
D12	Within three months of commencing an Independent Environmental Audit, or within another timeframe agreed by the Planning Secretary, the Applicant must submit a copy of the audit report to the Planning Secretary, and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of the recommendations. The recommendations must be implemented to the satisfaction of the Planning Secretary. *Note: The audit team must be led by a suitably qualified auditor and include experts in any fields specified by the Planning Secretary.*	Refer Audit report.	None required	--
	Monitoring and Environmental Audits			
D13	Any condition of this consent that requires the carrying out of monitoring or an environmental audit, whether directly or by way of a plan, strategy or program, is taken to be a condition requiring monitoring or an environmental audit under Division 9.4 of Part 9 of the EP&A Act. This includes conditions in respect of incident notification, reporting and response, non-compliance notification, compliance report and independent audit. *Note: For the purposes of this condition, as set out in the EP&A Act, "monitoring" is monitoring of the development to provide data on compliance with the consent or on the environmental impact of the development, and an "environmental audit" is a periodic or particular documented evaluation of the development to provide information on compliance with the consent or the environmental management or impact of the development*	Refer Audit report.	None required	--
D14	Noise and air quality monitoring under Part B of this Schedule is not required at all privately-owned residences and the use of representative monitoring locations can be used to demonstrate compliance with criteria	Noted	None required	--
	ACCESS TO INFORMATION			

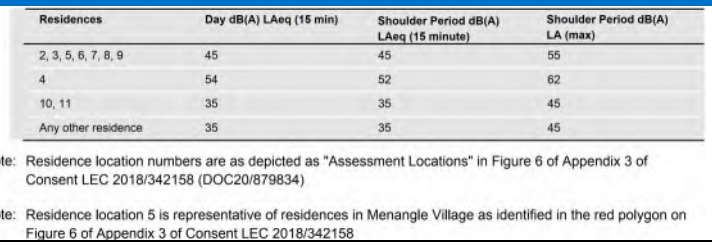
AUDIT CHECKLIST FOR 2021 CONSOLIDATED CONSENT MODIFICATION 2 - SCHEDULE 2

No.	Condition	Observation	Recommendation	Risk Level
D15	Prior to commencing Quarrying Operations in the Stage 8 Area, the Applicant must: (a) make the following information and documents (as they are obtained, approved or as otherwise stipulated within the conditions of this consent) publicly available on its website: (i) the document/s listed in condition A7(c); (ii) all current statutory approvals for the development; (iii) all approved strategies, plans and programs required under the conditions of this consent; (iv) regular reporting on the environmental performance of the development in accordance with the reporting requirements in any plans or programs approved under the conditions of this consent; (v) a comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs; (vi) a summary of the current stage and progress of the development; (vii) contact details to enquire about the development or to make a complaint; (viii) a complaints register, updated monthly; (ix) the Annual Reviews of the development; (x) audit reports prepared as part of any Independent Environmental Audit of the development and the Applicant's response to the recommendations in any audit report; (xi) any other matter required by the Planning Secretary; and (b) keep such information up to date for the life of the development and to the satisfaction of the Planning Secretary.	The documents reviewed by the Auditor were obtained from the Benedict website and directly from Benedict.	None required	--

AUDIT CHECKLIST FOR ENVIRONMENT PROTECTION LICENCE 3991

No.	Condition	Observation	Recommendation	Risk Level
2 LIMIT CONDITIONS				
L1	**POLLUTION OF WATERS**			
L1.1	Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.	Noted	Not triggered	--
L2	**WASTE**			
L2.1	The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled "Waste" and meeting the definition, if any, in the column titled "Description" in the table below. Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled "Activity" in the table below. Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled "Other Limits" in the table below. This condition does not limit any other conditions in this licence.	The wastes allowed to be received at site comprise mulched vegetation, ENM, wood waste, mature compost, manuare, coal ash, VENM, B&D waste. Benedict advised that only waste types allowed on the EPL are accepted at the Site, with any non-complying loads being rejected and not allowed on-site. No coal ash or B&D waste received by site. All imported material weighed on weighbridge & data recorded. Auditor observations consistent with these material types (refer photos in Appendix F)	Continue to operate site in compliance with Condition L2.1. Data on imported materials received at site to be included in Benedict Annual Report	Low
L2.2	Building and Demolition (B&D) Waste received at the premises in accordance with the licence must not be processed on site other than blending with virgin excavated natural material.	Benedict advised that no coal ash or B&D waste was received at site. All imported material weighed on weighbridge & data recorded. Auditor observations consistent with these material types (refer photos in Appendix F)	Continue to operate site in compliance with Condition L2.2. Data on imported materials received at site to be included in Benedict Annual Report	Low
L2.3	B&D Waste as outlined in Condition L2.1 stockpiled at the premises at any time must not exceed the following maximum quantities: (a) 6,000 tonnes of unblended B&D waste; and (b) 10,000 tonnes of B&D waste as the recycled portion when blended with VENM in accordance with Condition L2.2 of this Licence.	Refer feedback to Condition L2.2	Continue to operate site in compliance with Condition L2.2. Data on imported materials received at site to be included in Benedict Annual Report	Low
L2.4	**Authorised Amount**			
L2.5	The authorised amount of waste permitted on the premises cannot exceed 101,900 tonnes in total, or sub-totals for different wastes as specified under 'Other Limits' in the table under Condition L2.1, at any time.	Benedict advised that this data was provided in the EPA WARRP system	Continue to operate site in compliance with Condition L2.5. Benedict to include copy of weekly stockpile tracker data in future Annual Reports	Low
L2.6	Notwithstanding any limit specified in the table at Condition L2.1 'Other Limits', the licensee shall not exceed the authorised amount specified in this licence. Where the authorised amount is less than the total of all wastes listed above, the authorised amount takes precedent.	Benedict advised that this data was provided in the EPA WARRP system	Continue to operate site in compliance with Condition L2.6. Benedict to include copy of weekly stockpile tracker data in future Annual Reports	Low
L3	**NOISE LIMITS**			
L3.1	Noise from the premises must not exceed the following limits:			

AUDIT CHECKLIST FOR ENVIRONMENT PROTECTION LICENCE 3991

No.	Condition	Observation	Recommendation	Risk Level
		The Benedict 2023 Annual Review advised that general quarry operating hours are Mon-Fri 6am-5pm & Sat 6am-12pm. No outside hours work was undertaken during the audit period. No noise issues were made by Councils as part of the Audit consultation process (referSection 4.7)	Continue to operate site in compliance with Condition L3.1.	Negligible
L3.2	For the purpose of condition L3.1, Shoulder Period is 6.00am to 7.00am Monday to Saturday.	Noted	Continue to operate site in compliance with Condition L3.1.	Negligible
L3.3	For the purposes of Condition L3.1, monitoring may be undertaken at the Noise Monitoring locations (representative of Assessment Locations) as referred to in Figure 1.1 of Noise Compliance Assessment dated 31 October 2023 as supplied to the EPA (DOC24/157281)	EMM reported compliance with Consent & EPL noise conditions. Refer results in EMM (31/10/23) Noise Compliance Assessment & EMM (12/03/24) Noise Compliance Q1 Assessment.	Continue to operate site in compliance with Condition L3.3.	Negligible
L3.4	The noise emission limits identified in Condition L3.1 do not apply if the licensee has an agreement with the owner/s of the relevant residence or land to exceed the noise limits and the licensee has advised the EPA in writing of the terms of this agreement.	Not triggered	None required	--
L3.5	The noise limits in Condition L3.1 are to apply under all meteorological conditions except the following: (a) where 3^{o}C /100 metres (m) lapse rates have been assessed, then: (i) wind speeds greater than 3 m/s measured at 10m above ground level; (ii) temperature inversion conditions between 1.5^{o}C and 3^{o}C/100m and wind speeds greater than 2m/s measured at 10m above ground level; or (iii) temperature inversion conditions greater than 3^{o}C/100m (b) where Pasquill Stability Classes have been assessed, then: (i) wind speeds greater than 3m/s at 10m above ground level; (ii) stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or (iii) stability category G temperature inversion conditions.	Not triggered	None required	--
L3.6	Except for wind speed at microphone height, the data to be used for determining meteorological conditions shall be that recorded by the meteorological station required under Consent LEC 2018/342158	EMM reported compliance with Consent & EPL noise conditions. Refer results in EMM (31/10/23) Noise Compliance Assessment & EMM (12/03/24) Noise Compliance Q1 Assess/t.	Continue to operate site in compliance with Condition L3.6.	Negligible
L4	**HOURS OF OPERATION**			

Residences	Day dB(A) LAeq (15 min)	Shoulder Period dB(A) LAeq (15 minute)	Shoulder Period dB(A) LA (max)
2, 3, 5, 6, 7, 8, 9	45	45	55
4	54	52	62
10, 11	35	35	45
Any other residence	35	35	45

Note: Residence location numbers are as depicted as "Assessment Locations" in Figure 6 of Appendix 3 of Consent LEC 2018/342158 (DOC20/879834)

Note: Residence location 5 is representative of residences in Menangle Village as identified in the red polygon on Figure 6 of Appendix 3 of Consent LEC 2018/342158

AUDIT CHECKLIST FOR ENVIRONMENT PROTECTION LICENCE 3991

No.	Condition	Observation	Recommendation	Risk Level
L4.1	The licensee must comply with the following hours of operations: a) Construction work: 7am to 5pm Monday to Friday; 7am to 1pm on Saturdays; At no time on Sundays or public holidays b) Quarrying operations (including loading and dispatch of laden trucks): 6am to 5pm Monday to Friday; 6am to 12pm Saturdays; At no time on Sundays of public holidays c) Maintenance, security, office work, cleaning etc: May be conducted at any time, provided these activities are not audible at any residence on privately-owned land.	Refer feedback to Condition L3.1	Continue to operate site in compliance with Condition L4.1.	Negligible
L5	**POTENTIALLY OFFENSIVE ODOUR**			
L5.1	The licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises. *Note: Section 129 of the Protection of the Environment Operations Act 1997, provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour.*	Section 4.3 AQMP advised low risk of odour generating activities at site. The Benedict 2023 Annual Review advised no odour complaints received during audit period. Benedict advised size of compost / manure stockpiles kept minimal in a continuous operation. Stockpile size maintained at about 500m3 at any one time.	Continue to operate site in compliance with Condition L5.1.	Negligible
	3 OPERATING CONDITIONS			
O1	**ACTIVITIES MUST BE CARRIED OUT IN A COMPETENT MANNER**			
O1.1	Licensed activities must be carried out in a competent manner. This includes: a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.	Benedict advised that all employees are trained. The Auditor considered weight of evidence supports compliance because of obervations made by site inspection, comprehensive management systems, no issues raised by stakeholders, annual inspections by EPA/Planning	Continue to operate site in compliance with Condition O1.1	Negligible
O1.2	All operations and activities occurring at the premises must be carried out in a manner that will prevent and minimise fire at the premises.	Benedict advised that fire training conducted annually for all site staff as part of PIRMP. No feedback from Fire & Rescue	Continue to operate site in compliance with Condition O1.2	Negligible
O2.1	**MAINTENANCE OF PLANT AND EQUIPMENT**			
O2.1	All plant and equipment installed at the premises or used in connection with the licensed activity: a) must be maintained in a proper and efficient condition; and b) must be operated in a proper and efficient manner.	Benedict advised that all machines were serviced every 500 hours by suppliers who hold maintenance records. Auditor observed all site equipment was operational - refer photos in Appendix F	Benedict to provide data addressing EPL Condition O3.1 in future Annual Review reports.	Low
O3	**DUST**			

No.	Condition	Observation	Recommendation	Risk Level
O3.1	The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.	AQMP (Section 5.2) concluded that risk of adverse air quality impacts in surrounding environment from compliant operations at quarry was low. Benedict 2023 Annual Review advised no non-compliances. Automatic sprays, haul roads have 20km/hr speed limits, keep equipment movements to minimum, suspend dusty operations on a windy day. No dust complaints received during audit period. Auditor observed dust control measures being implemented (refer photos Appendix F).	Continue to operate site in compliance with Condition O3.1	Negligible
O4	**WASTE MANAGEMENT**			
O4.1	The licensee must ensure that unprocessed and processed waste stockpiles do not exceed 4 m in height from ground level.	Auditor observed stockpile heights < 4m	Continue to operate site in compliance with Condition O4.1	Negligible
O4.2	The licensee must install and maintain stockpile height markers at the premises. The markers must show the stockpile height limit of 4m and be positioned so that a visual check of all stockpiles at the premises.	Auditor observed stockpile heights < 4m	Continue to operate site in compliance with Condition O4.2	Negligible
4 MONITORING AND RECORDING CONDITIONS				
M1	**MONITORING RECORDS**			
M1.1	The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.	Copies of documents included on Benedict website. Refer list of documents in Section 2.6	Continue to operate site in compliance with Condition M1	Negligible
M1.2	All records required to be kept by this licence must be: a) in a legible form, or in a form that can readily be reduced to a legible form; b) kept for at least 4 years after the monitoring or event to which they relate took place; and c) produced in a legible form to any authorised officer of the EPA who asks to see them.			
M1.3	The following records must be kept in respect of any samples required to be collected for the purposes of this licence: a) the date(s) on which the sample was taken; b) the time(s) at which the sample was collected; c) the point at which the sample was taken; and d) the name of the person who collected the sample.			
M2	**RECORDING OF POLLUTION COMPLAINTS**			
M2.1	The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.	Benedict advised that a complaints log is maintained at the weighbridge. Copies of complaint registers for the 2021 - 2024 period provided on Benedict website at https://www.benedict.com.au/about/policies-compliance/. The registers indicated zero complaints.	Continue to operate site in compliance with Condition M2.1	Negligible

No.	Condition	Observation	Recommendation	Risk Level
M2.2	The record must include details of the following: a) the date and time of the complaint; b) the method by which the complaint was made; c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect; d) the nature of the complaint; e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and f) if no action was taken by the licensee, the reasons why no action was taken.	Refer response to Condition M2.1	Continue to operate site in compliance with Condition M2.2	Negligible
M2.3	The record of a complaint must be kept for at least 4 years after the complaint was made.	Noted	Continue to operate site in compliance with Condition M2.3 & M2.4	Negligible
M2.4	The record must be produced to any authorised officer of the EPA who asks to see them.	Noted		
M3	**TELEPHONE COMPLAINTS LINE**			
M3.1	The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.	Complaints phone number advertised at main entrance	Continue to operate site in compliance with Condition M2.2	Negligible
M3.2	The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.			
M3.3	The preceding two conditions do not apply until one month after the date of the issue of this licence.	Noted	None required	--
5 REPORTING CONDITIONS				
R1	**ANNUAL RETURN DOCUMENTS**			
R1.1	The licensee must complete and supply to the EPA an Annual Return in the approved form comprising: 1. a Statement of Compliance, 2. a Monitoring and Complaints Summary, 3. a Statement of Compliance - Licence Conditions, 4. a Statement of Compliance - Load based Fee, 5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan, 6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and 7. a Statement of Compliance - Environmental Management Systems and Practices. At the end of each reporting period, the EPA will provide to the licensee notification that the Annual Return is due.	Copies of annual review for 11/06/23 - 10/06/24 provided on the Benedict website at https://www.benedict.com.au/about/policies-compliance/. Copies of annual returns also provided on EPA website for 2000 - 2023. The Auditor received no feedback from stakeholders regarding these annual reports	Continue to operate site in compliance with Condition R1	Negligible
R1.2	An Annual Return must be prepared in respect of each reporting period, except as provided below. Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.			

AUDIT CHECKLIST FOR ENVIRONMENT PROTECTION LICENCE 3991

No.	Condition	Observation	Recommendation	Risk Level
R1.3	Where this licence is transferred from the licensee to a new licensee: a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period. Note: An application to transfer a licence must be made in the approved form for this purpose.	Not relevant	None required	--
R1.4	Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on: a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.	Not relevant	None required	--
R1.5	The Annual Return for the reporting period must be supplied to the EPA via eConnect EPA or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').	Benedict advised the reports were submited on time, which is consistent with the times received by the EPA as listed on their website	Continue to operate site in compliance with Condition R1.5	Negligible
R1.6	The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.	Copies of EPA annual returns for 2018 - 2023 provided on the Benedict website at https://www.benedict.com.au/about/policies-compliance/	Continue to operate site in compliance with Condition R1.5	Negligible
R1.7	Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by: a) the licence holder; or b) by a person approved in writing by the EPA to sign on behalf of the licence holder.	Compliance achieved	Continue to operate site in compliance with Condition R1.5	Negligible
R2	**NOTIFICATION OF ENVIRONMENTAL HARM**			
R2.1	Notifications must be made by telephoning the Environment Line service on 131 555. *Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.*	Benedict advised there were no incidents, which was consistent with information provided in the Annual Reports	Continue to operate site in compliance with Condition R2.1	Negligible

No.	Condition	Observation	Recommendation	Risk Level
R2.2	The licensee must provide written details of the notification to the EPA within 7 days of the date on which they became aware of the incident.	The Benedict 2023 Annual Review (Section 5) advised that there were no significant incidents or lost time through injury in 2023. Benedict also advised that there were no significant incidents or lost time through injury in 2024	Continue to operate site in compliance with Condition R2.2	Negligible
R3	**WRITTEN REPORT**			
R3.1	Where an authorised officer of the EPA suspects on reasonable grounds that: a) where this licence applies to premises, an event has occurred at the premises; or b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence, and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.	Noted	Not triggered	--
R3.2	The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.	Noted	Not triggered	--
R3.3	The request may require a report which includes any or all of the following information: a) the cause, time and duration of the event; b) the type, volume and concentration of every pollutant discharged as a result of the event; c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event; d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort; e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants; f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and g) any other relevant matters.	Noted	Not triggered	--
R3.4	The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.	Noted	Not triggered	--
6 GENERAL CONDITIONS				
G1	**COPY OF LICENCE KEPT AT THE PREMISES OR PLANT**			
G1.1	A copy of this licence must be kept at the premises to which the licence			

Appendix F. Site Inspection Photographs

Site inspection 24 October 2024

Site entrance, weighbridge, wheel wash, roads and admin facilities

Photo 1 Site entrance / exit showing sealed road, security gate and signage

Photo 2 Rumble grid near site entrance / exit with weighbridge and office in background

Photo 3 Automated weighbridge and office

Photo 4 Wheelwash for trucks leaving site located before weighbridge

Photo 5 Wheelwash water holding pond

Photo 6 Workshop and laydown area near site entrance / office area

Photo 7 Self bunded diesel fuel storage tanks

Photo 8 Automated dust suppression system at equipment laydown area near site office

Photo 9 Water cart & tractor for dust suppression

Groundwater monitoring wells and dust deposit gauge stations

Photo 10 Wells BH01_S & BH01_D at northern end of Stage 8 in low lying area beside Nepean River

Photo 11 Well BH03 at southern end of Stage 8 beside Nepean River

Photo 12 Well BH04 and dust monitoring location DDG3 at southern end of plateau area

Photo 13 Well BH02 at northern end of Stage 8 area

Northern sand and soil processing area

Photo 14 Sand screening operation

Photo 15 Sand and soil stockpiles

Underpass below M31 Hume Motorway

Photo 16 Underpass entrance on northern side

Photo 17 Underpass entrance on southern side

Unmined southern end of Stage 8 area

Photo 18 Unmined southern end of Stage 8 looking south

Photo 19 Unmined southern end of Stage 8 looking south to east

Photo 20 Northern plateau area looking east to south

Photo 21 Final landform subject to ongoing management

Photo 22 Final landform for rehabilitated areas in Stages 8A - 8C

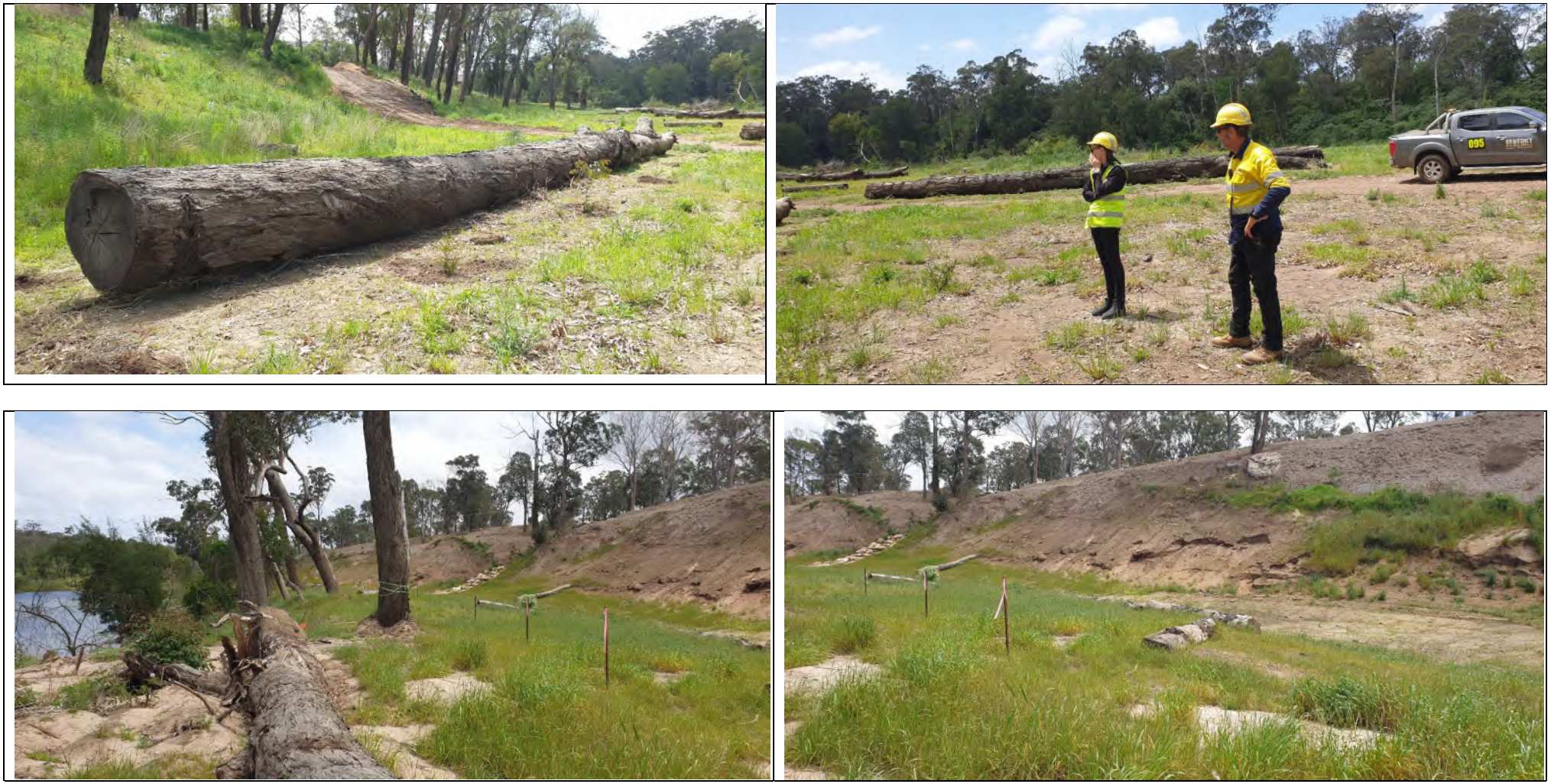


Photo 23 Final landform for rehabilitated areas in Stages 8A - 8C

Photo 24 Final landform for rehabilitated area in Stages 8A - 8C

Photo 25 Sub Stage 8A Restoration Area Plot 1

Photo 26 Final landform for rehabilitated mined area in Stages 8A - 8C

Photo 27 Bird box in native tree

Photo 27 Rip rap protected surface water drain

Photo 28 Scar tree

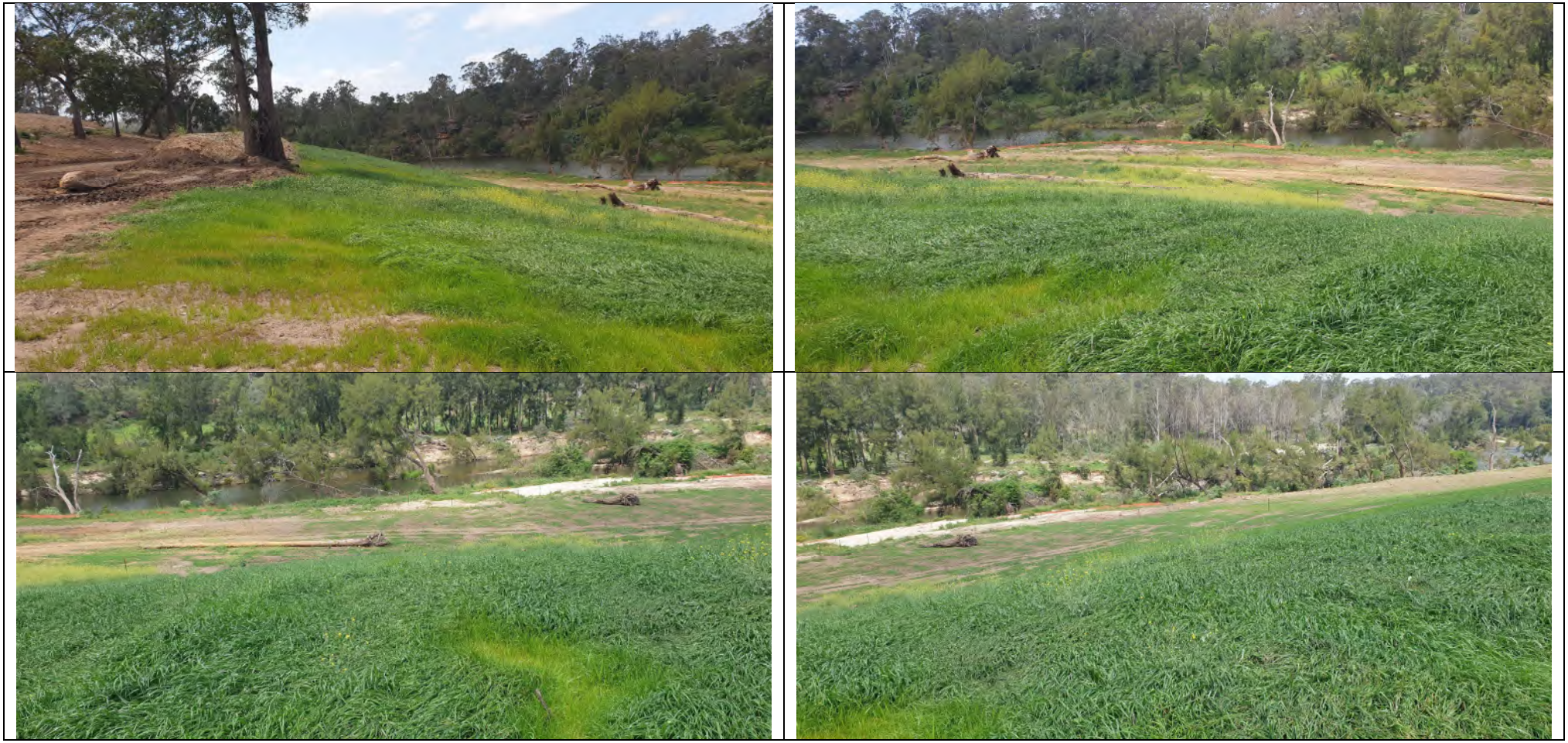


Photo 29 Revegetated areas in Stage 8A