Fraser Earthmoving Construction Pty Ltd

ABN: 84 476 527 814

Howlong Sand and Gravel Expansion Project

Submissions Report

State Significant Development 17_8804

Prepared by:

R.W. CORKERY & CO. PTY. LIMITED

February 2022

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for the

Howlong Sand and Gravel Expansion Project

State Significant Development 17_8804

Prepared for:

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Ref No. 1019/02

February 2022

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LIST OF ACRONYMS

ACHA	Aboriginal Cultural Heritage Assessment
AEP	Annual Exceedance Probability
AES	Advanced Environmental Systems Pty Ltd
AHD	Australian Height Datum
AIP	Aquifer Interference Policy
AHIMS	Aboriginal Heritage Information Management System
ANZG	Australia and New Zealand Guidelines
AQIA	Air Quality Impact Assessment
BAL	Basic Left Turn
BAM	Biodiversity Assessment Method
BAR	Basic Right Turn
BCD	Biodiversity Conservation and Science Directorate
BDAR	Biodiversity Development Assessment Report
DECCW	Department of Environment, Climate Change and Water
DPIE	Department of Planning, Industry and Environment
DPIE-Water	Department of Planning Industry and Environment - Water
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
GDE	Groundwater Dependent Ecosystem
IBRA	Interim Biogeographical Region of Australia
LALC	Local Aboriginal Land Council
LFN	Low Frequency Noise
LGA	Local Government Area

LTAAEL	Long-term, Average Annual Extraction Limits
NIRV	Noise from Industry in Regional Victoria
NPfI	Noise Policy for Industry
NRAR	Natural Resources Access Regulator
OEH	Office of Environment and Heritage
PCT	Plant Community Type
PIRMP	Pollution Incident Response Management Plan
RAP	Registered Aboriginal Party
SAII	Serious and Irreversible Impacts
SEARs	Secretary's Environmental Assessment Requirements
SVT	State Vegetation Type
TfNSW	Transport for NSW
TTPP	The Transport Planning Partnership
USGS	United States Geological Survey
WAD	Works Authorisation Deed

1. INTRODUCTION

1.1 SCOPE

This *Submissions Report* has been compiled to provide a response to the matters raised in submissions lodged with the Department of Planning, Industry and Environment (DPIE) during the exhibition period for the *Environmental Impact Statement* (EIS) for the continuation and expansion of extraction, processing and product transport operations at the Howlong Sand and Gravel Quarry (the Project) proposed by Fraser Earthmoving Construction Pty Ltd (the Applicant). The EIS and supporting technical assessments were exhibited by DPIE from 27 April 2020 to 27 May 2020. During that period, submissions were received from the public, community organisations and Government agencies including the following.

- Of the public and organisation submissions:
  - 8 submissions supported the Project;
  - 9 submissions commented on the Project; and
  - 25 submissions objected to the Project.
- 12 Government agencies[1] provided comments and recommendations on the application including Federation Council (Council).

As Council has not objected to the Project, there are fewer than 50 public objections authored by persons residing within a 50km radius of the Quarry Site and the Applicant has not made reportable political donations, the Project does not require referral to the Independent Planning Commission[2]. As the Project is a State Significant Development, the development application will be determined by the Minister for Planning and Public Space, or their delegate.

This document provides a response on behalf of the Applicant to the matters raised in submissions. For ease of review, the responses to Government authorities are presented separately to public submissions with the responses to public submissions generally grouped under the matter raised, with these presented in alphabetical order. The Applicant is confident that the concerns and objections raised in the submissions have been appropriately identified and addressed in this report. A summary of the matters raised in each public or organisation submission and where they are addressed in the document is presented in **Appendix 1**. The Applicant considers that this *Submissions Report*, when reviewed with the EIS and supporting documents, provides sufficient information for the consent authority to determine the development application.

1.2 DOCUMENT FORMAT

Preparation of this *Submissions Report* has involved contributions from a multi-disciplinary team including many of the specialist consultants who were involved in the original assessments for the EIS. Supplementary assessments and/or more detailed information has been incorporated into this document to address the issues raised in the various submissions.

[1] The comments provided by Transport for NSW were duplicated on the Major Projects Portal under Transport for NSW and Roads and Maritime Services. These comments have only been counted once.
[2] Clause 8A of the *State Environmental Planning Policy (State and Regional Development) 2011* provides for the circumstances under which the Independent Planning Commission is declared the consent authority for State Significant Development.

This document has been compiled in five sections with 13 appendices.

Section 1: Introduces the scope and format of this document.

Section 2: Presents an analysis of submissions categorised according to the issues raised.

Section 3: Provides a summary of the actions undertaken since the exhibition period to address the issues raised in submissions.

Section 4: Provides a detailed summary of the Applicant's response to the issues raised in submissions.

Section 5: Presents an evaluation of the merits of the Project, drawing upon the relevant responses to the issues raised in submissions.

A set of appendices is attached to this document including supplementary assessments prepared to support the *Submissions Report*.

Appendix 1: Submissions Summary

Appendix 2: Summary of Management and Mitigation Measures Proposed for the Project

Appendix 3: Intersection Design – Quarry Access Road / Riverina Highway

Appendix 4: Transport for NSW – Correspondence Regarding Intersection Design

Appendix 5: Aboriginal Cultural Heritage Assessment prepared by Landskape Natural and Cultural Heritage Management

Appendix 6: Biodiversity Development Assessment Report prepared by EnviroKey

Appendix 7: Updated Groundwater Impact Assessment prepared by Water Technology

Appendix 8: Review of Flood Modelling Outcomes prepared by Water Technology

Appendix 9: Pit and Floodplain Stability Assessment prepared by Water Technology

Appendix 10: Supplementary Noise Impact Assessment prepared by Octave Acoustics

Appendix 11: Driver's Code of Conduct

Appendix 12: Road Transport Letter Report prepared by The Transport and Planning Partnership

Appendix 13 Level Three Bridge Assessment prepared by Aussie Bridges Pty Ltd

2. ANALYSIS OF SUBMISSIONS

2.1 BREAKDOWN OF SUBMISSIONS

During the exhibition period, 54 submissions were received by DPIE from the public, community organisations and government agencies and included the following.

- 25 public submissions objecting to the Project.
- 8 public submissions supporting to the Project.
- 9 public submissions commenting on the Project.
- 12 submissions from Government agencies providing comments and recommendations.

A Submissions Summary is presented in **Appendix 1**. Individuals who objected to the Project are all located in Howlong except for two individuals who are located in Barnawartha and St Kilda East. None of the general public who supported the Project reside in Howlong. Although there were 41 individual submissions from the general public, it is noted that one of these submissions was signed by 26 people, some of whom also made personal submissions.

2.2 CATEGORISATION OF ISSUES

Figure 1 displays the frequency of environmental, economic and social topics raised in the submissions by public individuals and organisations. Traffic and road-related comments were most frequently identified in objecting submissions with matters relating to groundwater, noise generation and biodiversity also frequently raised. Concerns regarding noise generated by the Project included both operational and road traffic noise.

All topics raised in submissions are comprehensively addressed in Section 4 of this document.

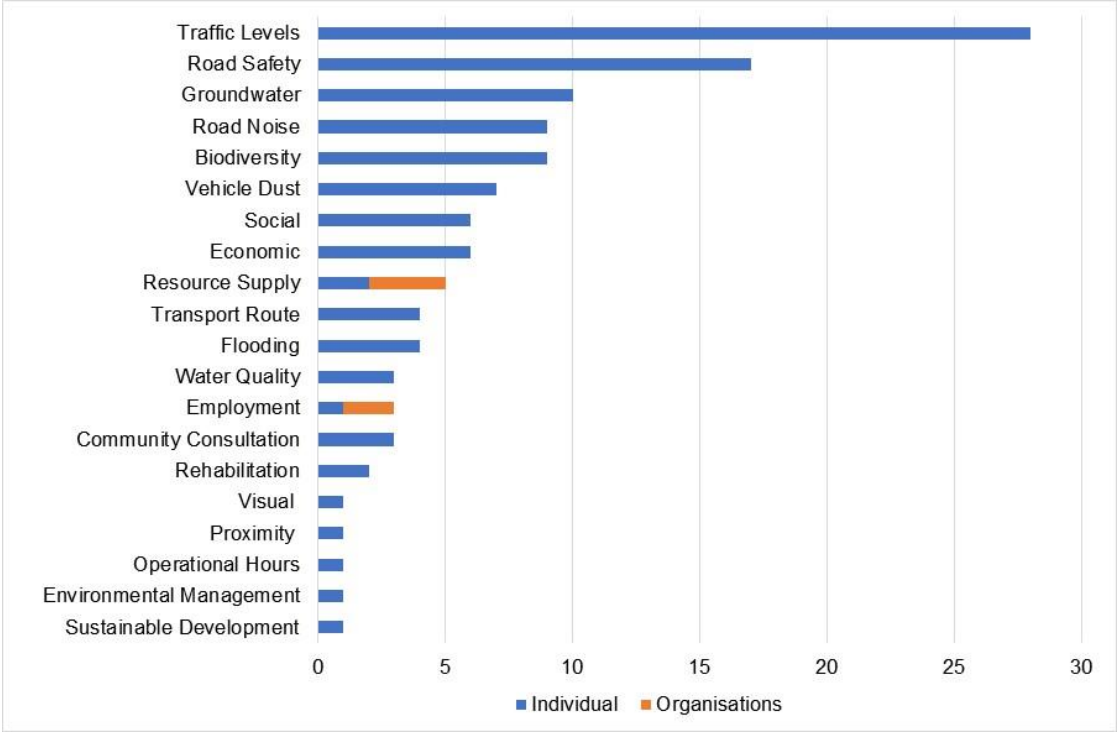


Figure 1
FREQUENCY OF TOPICS RAISED IN SUBMISSIONS

3. ACTIONS TAKEN SINCE PUBLIC EXHIBITION

3.1 INTRODUCTION

The following subsections present a summary of the refinements to the Project and additional assessments that have been undertaken in responding to the matters raised in submissions. In the case of the Aboriginal Cultural Heritage Assessment (ACHA) and Biodiversity Development Assessment Report (BDAR) for the Project, the assessment has been repeated in order to provide DPIE, relevant Government agencies and the community with confidence in the assessment process and outcomes. In addition, the Groundwater Impact Assessment and specifically the groundwater modelling assessment have been subject to independent peer review and this assessment has been updated to address the recommendations of the peer reviewer and to address the comments made in submissions. Finally, consultation with TfNSW on the traffic generation for the Project and the proposed upgrade of the intersection of the Quarry Access Road and the Riverina Highway has resulted in an updated intersection design which is also discussed below.

3.2 PROJECT REFINEMENTS

3.2.1 Quarry Site Layout

Several minor refinements to the Quarry Site layout have been made in response to the recommendations in Government agency feedback. Principally these relate to water management within the Quarry Site. The updated Quarry Site layout is presented in **Figure 2**. In summary the refinements to the layout have included the following.

1. An overburden emplacement to the north of the Stage 1 extraction area has been included. This area would be used for placement of materials that have a clay content that is too high to warrant processing (washing). The location of the overburden emplacement has previously been disturbed for existing operations and was originally marked for rehabilitation at the commencement of operations for the Project. However, it would now be used over the life of the Project and rehabilitated in the same manner as the processing and stockpiling area.

2. The flood levee in the Stage 1 extraction area has been realigned to closely follow the extraction limit and incorporate the overburden emplacement area. The original alignment would be constructed initially in the southwest corner for the duration of works required to reclaim the section of the Stage 1 extraction area that would constitute the 100m buffer between operations and the Murray River. After this time the levee would be removed and established at the extraction area boundary. The realignment is discussed further in Section 4.1.5.8 in response to the Department of Planning Industry and Environment - Water (DPIE-Water) recommendations for the Project.

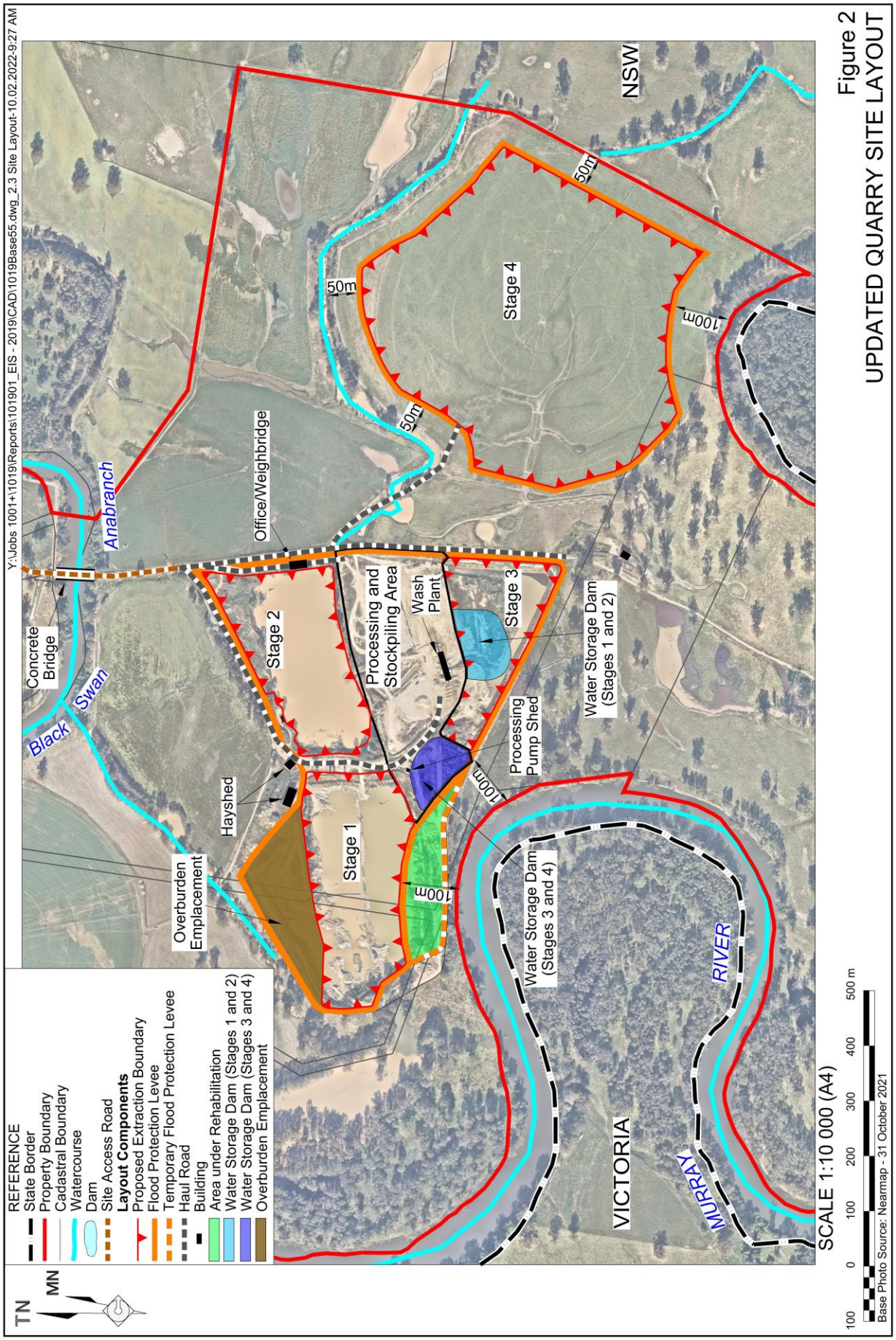


Figure 2
UPDATED QUARRY SITE LAYOUT
Y:\Jobs 1001+\1019\Reports\101901_EIS - 2019\CAD\1019Base55.dwg_2.3 Site Layout-10.02.2022-9:27 AM
REFERENCE
State Border
Property Boundary
Cadastral Boundary
Watercourse
Dam
Site Access Road
Layout Components
Proposed Extraction Boundary
Flood Protection Levee
Temporary Flood Protection Levee
Haul Road
Building
Area under Rehabilitation
Water Storage Dam (Stages 1 and 2)
Water Storage Dam (Stages 3 and 4)
Overburden Emplacement
TN
MN
NSW
VICTORIA
Anabranch
Black Swan
Concrete Bridge
Office/Weighbridge
Hayshed
Overburden Emplacement
Stage 1
Stage 2
Stage 3
Stage 4
Processing and Stockpiling Area
Wash Plant
Processing Pump Shed
Water Storage Dam (Stages 1 and 2)
Water Storage Dam (Stages 3 and 4)
50m
100m
RIVER
MURRAY
SCALE 1:10 000 (A4)
100 0 100 200 300 400 500 m
Base Photo Source: Nearmap - 31 October 2021

3. A Water Storage Dam would be developed initially in the vicinity of the Stage 3 extraction area and then relocated to the northeast to accommodate extraction activities from Stage 3. The Water Storage Dam would be a clay-lined turkeys nest style dam. This water management infrastructure is required to reduce the licensed water take for the Project and avoid effective double-counting of water removed from the active extraction area and then used for irrigation. The rationale for this change is discussed in more detail in Section 4.1.5.2 in response to the DPIE-Water recommendations for the Project. An updated water source and use schematic figure is presented as **Figure 3**.

4. Additional areas of revegetation have been added to the progressive rehabilitation plan in the vicinity of the access road and the Black Swan Anabranch (see **Figure 4**). These areas were added at the recommendation of Water Technology following review of erosion risks associated with flooding events. These matters are discussed further in Section 3.3.5.2. Riparian and water flow path areas would be stabilised in these locations. An updated plan presenting the indicative final landform is presented in **Figure 5**. This plan now incorporates the additional rehabilitation areas.

5. The Applicant now proposes to store diesel fuel for Project equipment outside the floodplain on land owned by the Applicant and used for agricultural activities. Refuelling activities would be undertaken similar to refuelling for agricultural activities with diesel transferred to a portable tank (likely on a utility) and transported to mobile equipment at the Quarry. Diesel storage and the associated hazards would no longer be required for the Project. Dedicated refuelling areas would be retained within the Processing and Stockpiling Area.

3.2.2 Quarry Access Arrangements

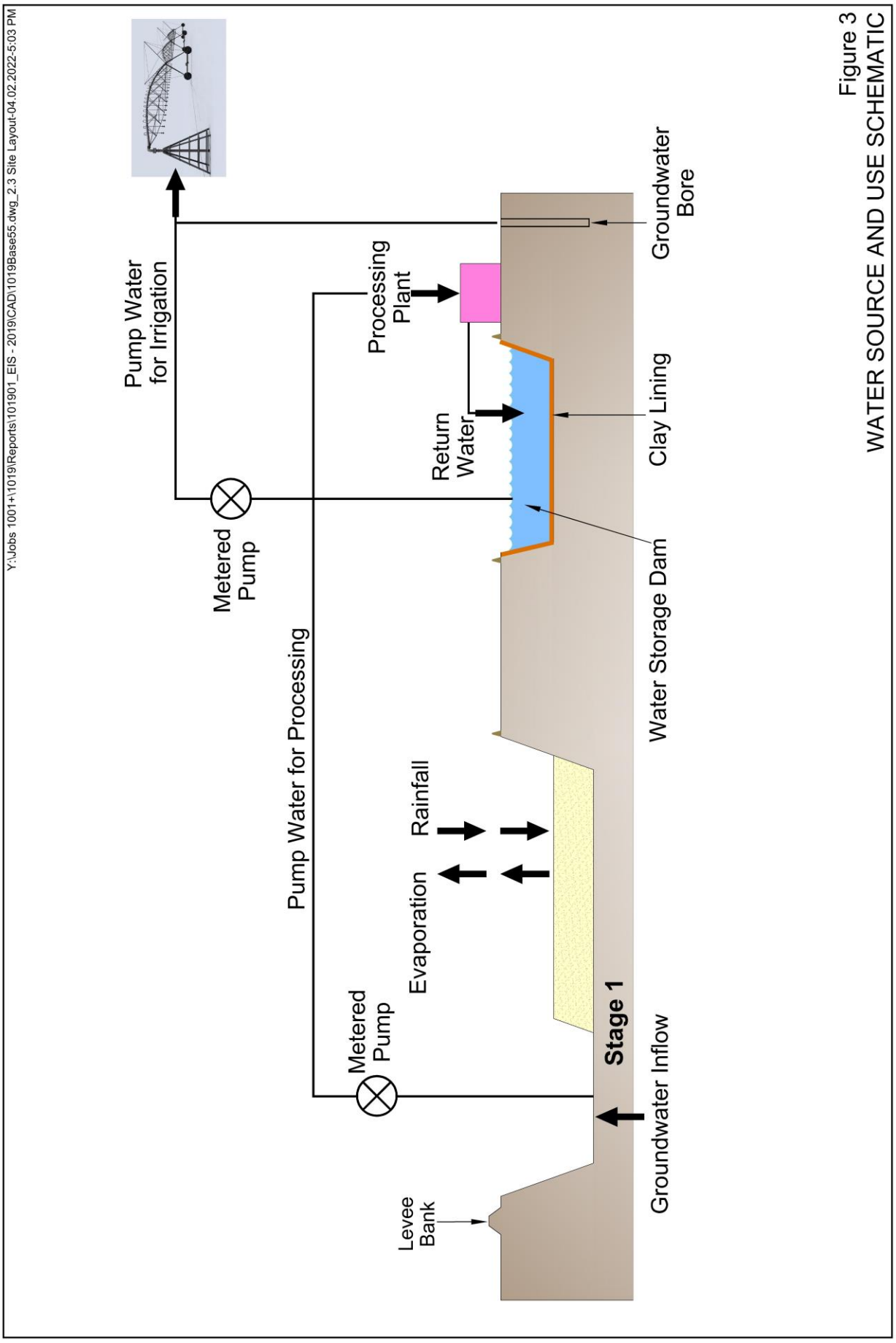
During the preparation of this Submissions Report, the Applicant and its consultants consulted with TfNSW on numerous occasions to discuss and resolve queries related to the design and use of the proposed upgraded intersection of the Quarry Access Road with the Riverina Highway. **Appendix 3** presents an update to the proposed strategic intersection design and **Appendix 4** presents the correspondence received from TfNSW on this matter confirming agreement to the proposed design presented in **Appendix 3**.

The following standard terms for design and construction of the intersection are proposed following consultation with TfNSW.

1. At a minimum, the intersection would be constructed with a sealed Basic Right Turn (BAR) and Basic Left Turn (BAL) treatment in accordance with the Austroads Guide to Road Design.

2. Minimum lane widths of 3.5m would be constructed for the Riverina Highway.

3. As a minimum, the access driveway to the Riverina Highway would be constructed as a ‘Rural Property Access’ type treatment in accordance with the Austroads Guide to Road Design with a minimum width of at least 6m to accommodate 2-way movement to the property boundary.


Y:\Jobs 1001+\1019\Reports\101901_EIS - 2019\CAD\1019Base55.dwg_2.3 Site Layout-04.02.2022-5:03 PM
Figure 3
WATER SOURCE AND USE SCHEMATIC
Groundwater Bore
Pump Water for Irrigation
Processing Plant
Return Water
Clay Lining
Metered Pump
Water Storage Dam
Pump Water for Processing
Rainfall
Evaporation
Metered Pump
Stage 1
Groundwater Inflow
Levee Bank

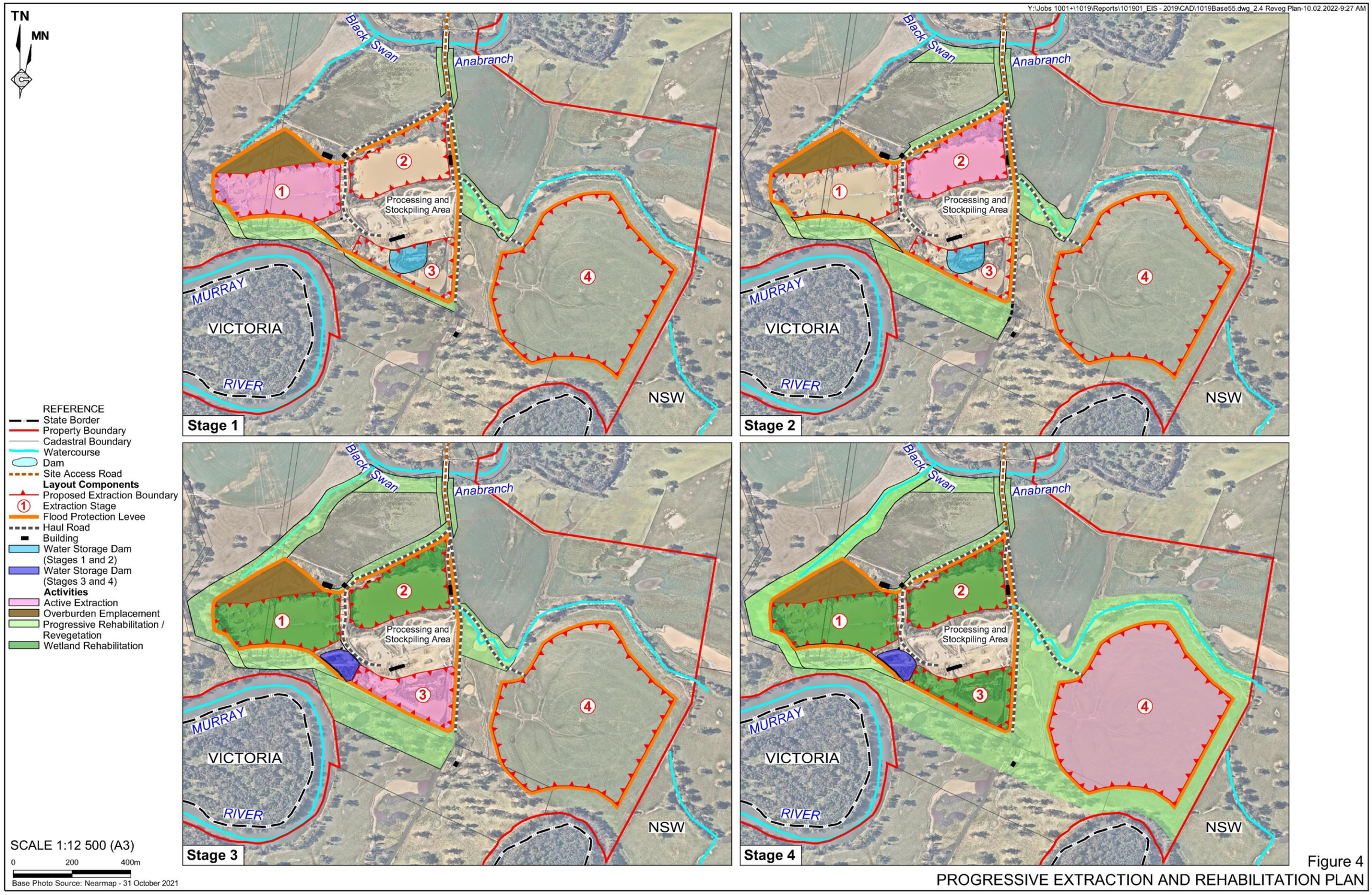


Figure 4
PROGRESSIVE EXTRACTION AND REHABILITATION PLAN

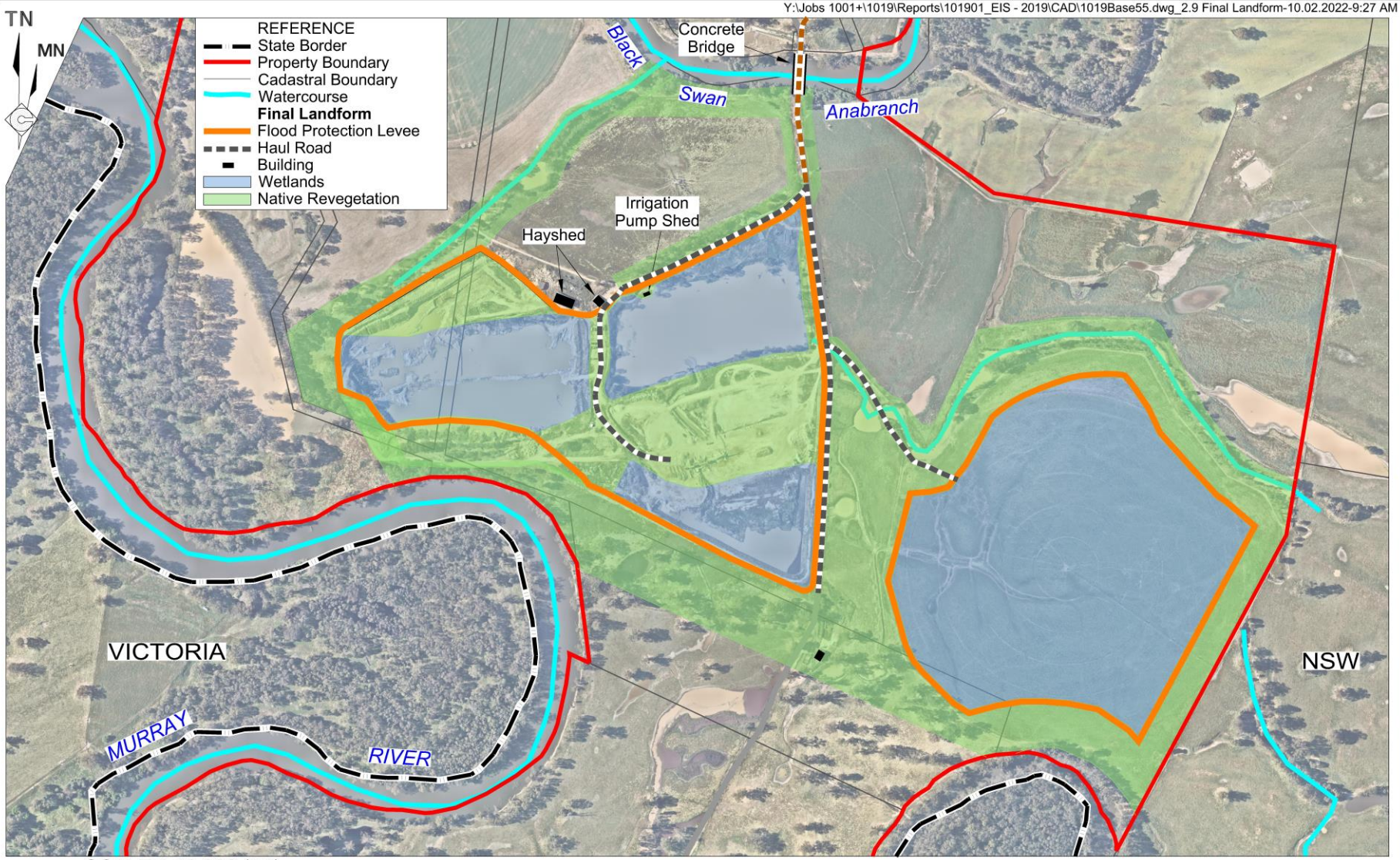


Figure 5
INDICATIVE FINAL LANDFORM

4. The access driveway to the Riverina Highway would be sealed for at least 30m from the edge of seal of the highway.
5. The design is based on the proposed limit to maximum hourly traffic of five laden loads (10 movements) across the entire day. This is reduced from six laden loads per hour as presented in the EIS.
6. A design speed limit for the Riverina Highway of 110km/hr was assumed (signposted limit of 100km/hr + 10%).
7. The Applicant would continue to use the existing gate to the property that consists of a double gate 7m wide (two 12ft gates) located approximately 85m from the edge of the Riverina Highway.

A number of suggested conditions of consent were included in the correspondence provided by TfNSW dated 20 August 2021 (see **Appendix 3**). The Applicant supports the inclusion of these matters in conditions of consent and acknowledges the need to enter into a Works Authorisation Deed (WAD) with TfNSW before finalising the design or undertaking any construction work within or connecting to the road reserve.

It is acknowledged that a consent granted in accordance with Section 138 of the *Roads Act 1993* is required prior to any works commencing, however Section 4.42(1)(f) of that Act requires that this consent cannot be refused and is to be substantially consistent with State Significant Development as it is approved under Division 4.7 of the EP&A Act 1979.

Additional review of baseline traffic levels assumed for assessment and a Driver's Code of Conduct were also requested by Federation Council (Council) and are addressed in more detail in Section 4.1.1.

3.3 SUPPLEMENTARY ASSESSMENT

3.3.1 Introduction

A range of additional assessments were commissioned in order to comprehensively address the matters raised in submissions. For the Aboriginal Cultural Heritage Assessment (ACHA) and Biodiversity Development Assessment Report (BDAR), new assessments were prepared to address the matters raised. For other assessments, the work completed was refined and improved in response to comments made. An independent peer review was also commissioned for the Groundwater Impact Assessment to seek third party input to support the groundwater modelling approach. The groundwater modelling was substantially updated in response to peer review recommendations and the matters raised in submissions.

The following subsections provide a brief summary of the additional assessments undertaken for the Project including the assessment outcomes and any additional management or mitigation measures that are recommended for the Project. A summary of all management and mitigation measures proposed for the Project is presented in **Appendix 2** and updates that presented as Section 7 of the EIS.

3.3.2 Aboriginal Cultural Heritage

3.3.2.1 Introduction

The Aboriginal Cultural Heritage Assessment (ACHA) submitted with the EIS was prepared by Advanced Environmental Systems Pty Ltd (AES, 2020a) with archaeologist Dr Timothy Stone completing the archaeological component of the report. Review of the assessment by the Biodiversity Conservation Division (the BCD – now Heritage NSW) identified (amongst other things) that stakeholder consultation had not been undertaken as required and questioned whether test pitting of the proposed extraction area should be undertaken for the Project given its location on an alluvial floodplain adjacent to a significant water resource (the Murray River). Due to availability issues for the existing archaeologist on the Project (Dr Timothy Stone), an additional assessment was commissioned from Landskape Natural and Cultural Heritage Management (Landskape).

As consultation with stakeholders is the first step in the cultural heritage assessment process, it was decided that Landskape would commence the assessment anew and prepare a new ACHA for the development. In consultation with officers of Heritage NSW, it was also determined that test pitting of the proposed Stage 4 extraction area (currently a cropping circle but undisturbed in the context of subsurface extraction) should be undertaken to examine the potential for human burials to be present and to identify any locations likely to contain artefacts. The Landskape ACHA is presented as **Appendix 5**, and referred to hereafter as Landskape (2021). The ACHA was prepared by Dr Matt Cupper, a qualified archaeologist and geoscientist, in accordance with the following relevant guidelines, as recommended by the Heritage NSW.

- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales.*
- *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW.*
- *Aboriginal cultural heritage consultation requirements for proponents 2010.*

The following subsections present an overview of the results of that assessment. The response to the submission received from Heritage NSW (as BCD) is provided in Section 4.1.2.

3.3.2.2 Archaeological Setting and Predictive Model

Howlong is located on the Riverine Plain which is a part of the Murray Basin. The types of cultural heritage sites previously recorded on the Murray River are stone artefacts, hearths, freshwater shell middens, earth mounds, quarry sites, modified trees, stone arrangements, ceremonial rings, ceremony dream sites and burials.

There are no previously recorded Aboriginal cultural heritage sites within the Quarry Site registered on the Heritage NSW Aboriginal Heritage Information Management System (AHIMS) database. The closest Aboriginal cultural heritage site to the Quarry Site is a stone artefact scatter (AHIMS site number 60-3-0134). This cultural deposit consists of eight stone artefacts located on a source bordering sand dune and are 350m north of the Stage 4 extraction area - outside the area of proposed disturbance.

Based on previous archaeological studies, which are detailed in Section 6 of Landskape (2021), an archaeological predictive model was constructed for the Quarry Site. The model predicts that stone artefact scatters, hearth sites, and isolated finds of stone artefacts or hearthstones have the potential to occur within the Quarry Site. Open occupation sites are typically found within 500m of water sources, so such sites are most likely to be encountered on level ground adjacent to the Murray River and adjacent creeks, lagoons and billabongs. Scars made by Aboriginal people may occur on the mature River Red Gum trees that grow adjacent to the Quarry Site. Shell middens also have the potential to occur. However, the potential presence of these Aboriginal cultural heritage sites is reduced due to historical land use in the area and large extent of disturbance of land from previous quarrying and agricultural activities at the property.

3.3.2.3 Stakeholder Consultation

Consultation with the Aboriginal community was undertaken in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010a). Aboriginal consultation is regulated under Clause 80C of the *National Parks and Wildlife Regulation 2009*, which consists of four stages.

Stage 1 – Notification of Project Proposal and Registration of Interest

Notifications were sent on 17 June 2020 to the BCD (now Heritage NSW), NSW Local Land Services, Federation Shire Council, National Native Title Tribunal, Native Title Services Corporation Limited, Albury and District Local Aboriginal Land Council (Albury LALC), and Office of the Registrar. Five individuals and organisations were identified from the responses received from these organisations. They were all contacted in writing on 29 June 2020 and invited to register an interest in the Project. An advertisement was also published in the Border Mail newspaper inviting expressions of interest from Aboriginal stakeholders.

The following Aboriginal stakeholders registered with Landskape for the Project, hereafter referred to as the Registered Aboriginal Parties (RAPs).

- Mr Mark Saddler from Bundyi Aboriginal Cultural Knowledge.
- Mr Andom Rendell from the Albury LALC.

Stage 2 – Presentation of Information about the Project

This stage requires project information to be provided to the RAPs and may involve an archaeological field survey. Information regarding the Project was provided to the RAPs on 4 September 2020 and input in relation to the proposed survey methodology and any Aboriginal culture knowledge within the Quarry Site was requested. Bundyi Aboriginal Cultural Knowledge responded on 7 September 2020 and advised that no changes were required to the proposed survey methodology.

Stage 3 – Gathering Information about Cultural Significance

This stage involves gathering information regarding cultural significance of the proposed development site. The aim is to facilitate a process by which Aboriginal community stakeholders can have input into the heritage assessment methodology and management options and provide information on the cultural significance of Aboriginal objects or places.

Information was gathered through an archaeological field survey on 15 October 2020 and through subsurface testing on 15 and 16 October 2020. During the survey, the RAPs were asked to contribute their knowledge regarding Aboriginal cultural heritage within the Quarry Site and surrounds.

Stage 4 – Review of Draft Aboriginal Cultural Heritage Assessment Report

The RAPs were invited to comment on the draft report. A preliminary draft of the ACHA report was provided to Mr Saddler and Mr Rendell for review and comment on 5 January 2021. On 1 February 2021, Mr Saddler advised that no changes were required to the draft ACHA. A finalised copy of the ACHA was provided to the RAPs on 15 February 2021. Whilst Albury LALC did not provide a response, they had previously provided correspondence supporting the Project.

3.3.2.4 Survey Results

Archaeological Field Survey Results

An archaeological field survey was undertaken on 15 October 2020 by archaeologist Dr Matt Cupper with the assistance of Mr Saddler and Mr Rendell. The methods and extent of the field survey is presented in Section 7.3 of Landskape (2021). The survey was undertaken on foot in a series of closely spaced transects distributed approximately 20m apart to examine for any archaeological traces such as stone artefacts, hearths, hearthstones, shells, bones, and mounds. There were no mature trees within the Quarry Site to be inspected for scarring or carving by Aboriginal people. The Ground Surface Visibility was high, at 90% and particular attention was paid to more visible areas during the field survey.

No artefacts, sites or areas of Aboriginal cultural value were identified within the Quarry Site during the field survey.

Subsurface Testing Results

Subsurface testing was conducted by the same participants of the field survey on 15 and 16 October 2020 through a hand test excavation in accordance with *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011) and the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b). Hand tools were used to excavate seven excavation test pits of 0.5m by 0.5m within the Stage 4 area. The excavation continued into sterile, indurated and mottled silty clay deposits at an approximate depth of 0.5m. Details of the methodology followed during subsurface testing is detailed in Section 7 of Landskape (2021). **Figure 6** presents the location of test pits within extraction Stage 4.

No artefacts, sites or areas of Aboriginal cultural value were identified within the Quarry Site during subsurface testing.

3.3.2.5 Management and Mitigation Measures

Management and mitigation measures that would be implemented for the Project include the following.

- Implementation of an unexpected find protocol (**Table 1**).

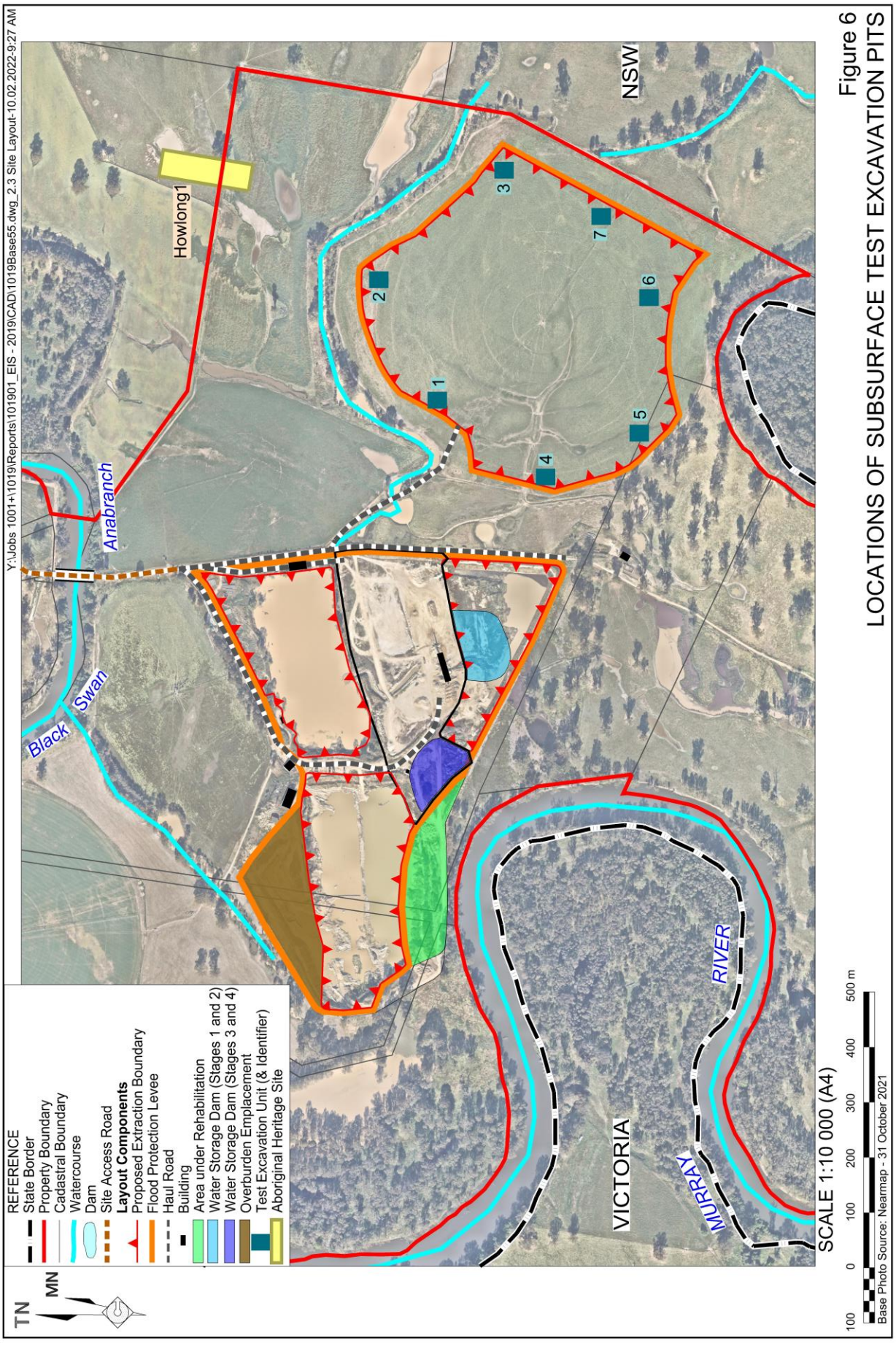


Figure 6
LOCATIONS OF SUBSURFACE TEST EXCAVATION PITS

- All relevant personnel, contractors and subcontractors would be made aware of the legal obligations for Aboriginal cultural heritage under the *National Parks and Wildlife Act 1974* through an on-site toolbox talk or induction.
- The Applicant has committed to protect a previously identified artefact scatter located on the property but outside of areas of disturbance for the Quarry (AHIMS 60-3-0134 – see **Figure 6**).

Table 1
Unexpected Find Protocol

Action / Observation	Notification / Reporting	Timing
Identification		
Material observed, and work ceased in the vicinity of the object.	Quarry Manager notified.	Immediately upon identification.
A 10m buffer area around the artefact is cordoned off to prevent access.	None	Immediately upon identification.
Skeletal Remains		
Material is human remains	Notification given via phone to: • NSW Police • Heritage NSW • DPIE	Immediately upon identification.
Commission an archaeologist to assess remains in consultation with Registered Aboriginal Stakeholders	Notification given via phone/letter/email to Registered Aboriginal Stakeholders.	Once remains are identified as of Aboriginal origin.
	Management strategy and reporting prepared in consultation with Heritage NSW and Registered Aboriginal Stakeholders if remains are of Aboriginal origin.	As agreed with relevant parties.
Artefactual Material		
Material is artefactual	Notification given via phone to the Heritage NSW and DPIE	Immediately upon identification.
Commission an archaeologist to undertake an assessment of the material in consultation with the Registered Aboriginal Stakeholders.	If the item is suspected to be Aboriginal in origin, notification would be given via phone/letter/email to Registered Aboriginal Stakeholders	Once material is confirmed to be of Aboriginal origin.
	Outcomes to be notified to the Heritage NSW and DPIE	To be confirmed with Heritage NSW.
Implement recommendations of assessment in consultation with the Registered Aboriginal Stakeholders	Documentation to be prepared by archaeologist describing the outcomes of assessment. Outcomes to be notified to the Heritage NSW and DPIE	To be confirmed with authorities and Registered Aboriginal Stakeholders (if relevant).
Re-Commence Extraction Works		
Approval in writing is given by the NSW Police or Heritage NSW to recommence works in the affected area.	Notification given to the following groups. • Registered Aboriginal Parties. • Heritage NSW • DPIE	Once outcomes of management strategies or assessment are resolved, or material is formally identified to not be artefactual.

Aboriginal cultural heritage management protocols for the operation would be described in a Heritage Management Plan.

The Applicant is aware that under Section 86 of the *National Parks and Wildlife Act 1974* it is an offence to harm or desecrate Aboriginal object or Aboriginal places. It is also an offence under Section 89A of the *National Parks and Wildlife Act 1974* to be aware of the location of an Aboriginal object and not notify the authorities of the location.

3.3.2.6 Assessment of Impacts

On two occasions, Aboriginal heritage field surveys have not located artefacts, sites, or areas of Aboriginal cultural value within the Quarry disturbance areas. Subsurface investigations in the Stage 4 extraction area also did not identify any evidence of artefacts, sites, or areas of Aboriginal cultural value. Landskape has supported the conclusions of AES (2020a) that the Project would not have any direct impact to Aboriginal cultural heritage. This may be partly attributable to heavy land disturbance from previous quarrying and agricultural activities.

The probability of finding previously unidentified Aboriginal cultural heritage within the Quarry Site is considered low. Furthermore, due to the absence of any culturally sensitive landforms such as lunettes or source-bearing sand dunes the chances of in situ subsurface cultural deposits being present are high unlikely.

Ongoing implementation of training and an unexpected find protocol would ensure potential impacts to unknown sites is avoided, where possible.

3.3.3 Biodiversity Development Assessment Report

3.3.3.1 Introduction

Part 8 of the EIS presented the *Biodiversity Development Assessment Report* (BDAR) for the Project, which was prepared by Advanced Environmental Systems Pty Ltd, and referred to hereafter as AES (2020b). Following receipt of the submission prepared by the Biodiversity Conservation Division (the BCD), EnviroKey Pty Ltd (EnviroKey) was engaged to complete a peer review of AES (2020b). That review determined that a new BDAR should be prepared to ensure consistency with the *Biodiversity Assessment Method* (BAM) (OEH, 2017)..

EnviroKey was engaged to prepare a new BDAR for the Project, which is presented as **Appendix 6**, and referred to hereafter as EnviroKey (2021). The BDAR was prepared by Mr Steven Sass (Principal Ecologist, B.App.Sci (Env.Sci) (Hons), GradCert.CaptVertMngt (CSU)) of EnviroKey, an Accredited Assessor (BAAS17047) in accordance with the BAM (OEH, 2017).

The following subsections present an overview of the results of that assessment. The Biodiversity Development Assessment Report for the Project is provided as **Appendix 6** and presents a detailed summary of the investigations and assessment outcomes. The response to the submission received from the BCD is provided in Section 4.1.2.

3.3.3.2 Local Setting

In accordance with the BAM, EnviroKey assessed a range of features within and surrounding the Quarry Site. These included identifying the relevant Interim Biogeographical Region of Australia (IBRA) (Thackway and Cresswell, 1995) and NSW landscape region (Mitchell Landscapes [Mitchell, 2002]). EnviroKey (2021) identified the Quarry Site as being situated within the Murray Fans subregion of the Riverina Bioregion (IBRA). EnviroKey (2021) identified the Quarry Site as occurring within two Mitchell Landscapes, namely:

- Murray Channels and Floodplains comprised of active channels and seasonally inundated floodplains of the Murray River and streams in Quaternary alluvium with associated billabongs, swamps, channels, levees and low-relief source bordering dunes (<10m). This landscape generally consists of river red gum forests (*Eucalyptus camaldulensis*) with black box (*Eucalyptus largiflorens*) and river cooba (*Acacia stenophylla).*
- Murray Scalded Plains characterised by Quaternary alluvial plains with extensive scalding an artifact of relic floodplains and terraces. Whilst this landscape is now generally cleared, cropped and grazed it was formerly open woodland and grasslands of white cypress pine (*Callitris glaucophylla*), grey box (*Eucalyptus microcarpa*) and myall (*Acacia pendula*) with annual grasses and herbs.

3.3.3.3 Native Vegetation

EnviroKey conducted a background review of existing vegetation mapping within the area of proposed disturbance (BDAR footprint) and a 1 500m buffer area. This review located the Quarry within a single vegetation mapping dataset (State Vegetation Type (SVT) Map: Riverina Region v1.2 (VIS_ ID4469). This dataset identified 10 Plant Community Types (PCTs) as present within a 1 500m radius of the Quarry Site.

In addition to previous field surveys completed by AES (2020b), EnviroKey conducted a field survey within the BDAR footprint, and in general across the Study Area on 6 and 7 July 2020. The additional field surveys were undertaken using the following method.

- BAM plot/transects in accordance with the BAM.
- Targeted threatened species surveys (including Sloane's Froglet survey).
- Random meanders across the BDAR footprint.

When all field survey results are considered (AES and EnviroKey), a total of 63 flora species have been recorded within the Study Area. These flora species predominately comprised exotic flora species (44 species). This species composition was expected given the existing use of the BDAR footprint and Study Area for either agricultural or quarry-related activities.

While the majority of the BDAR was found to be dominated by cleared land comprising mostly non-native vegetation, one PCT was recorded within the BDAR footprint, namely.

- PCT 5 River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion (OEH, 2020b).

This PCT was allocated native vegetation given the presence of River Red Gum (*Eucalyptus camaldulensis*) and the location of the BDAR footprint on a floodplain adjacent to the Murray River. A summary of PCT 5 is provided in **Table 2**.

Table 2
Summary of PCT 5

Vegetation Formation	Forested Wetland	
Vegetation Class	Inland Riverine Forest	
PCT code	5	
Extent within Subject land (and BDAR footprint)	124.327 ha (0.041 ha)	
BAM Plots within BDAR footprint	2 (BAM 1, BAM 2)	
BAM plots outside of BDAR footprint	Nil	
Condition	Low to moderate-good	
Conservation Status	NSW BC Act: Not listed	C'wealth EPBC Act: Not listed
Estimated % cleared (NSW)	40%	
Threatened plant species habitat	Given the dominance of exotic flora, no threatened species habitat is present.	

3.3.3.4 Threatened Species

The BAMC identified a range of ecosystem credit species that were predicted to occur within the BDAR footprint. All ecosystem credit species generated by BAMC were retained within the predicted species report given the presence of PCT 5, albeit as a highly modified, very small patch. **Table 3** outlines the predicted candidate species, from the BAMC, and provides a justification for the decision by EnviroKey to either maintain or discard each species as a candidate species based on the presence of suitable habitat within the BDAR footprint (defined as the area of impact).

No species credit species of candidate flora were retained within the BAMC due to the highly degraded nature of the BDAR footprint. Given this, no target field surveys for candidate flora were carried out.

Previous field survey by AES (2020b) did not detect any threatened species within the BDAR footprint. EnviroKey (2021) identified numerous Brown Treecreeper along the Black Swan Anabranch indicating one but likely more family groups along this watercourse.

The identified fauna was outside the BDAR footprint and EnviroKey (2021) considered that due to the highly degraded nature of the location, they were unlikely to occur. Brown Treecreeper was not added to the BAMC as a predicted ecosystem credit species.

Additional consideration was given to the possible presence of the White-bellied Sea Eagle and Sloanes Froglet through targeted surveys. No White-bellied Sea Eagle or nests were identified within and directly adjacent to the BDAR footprint. Sloanes Froglet was also not identified despite surveys of potentially suitable habitat within the BDAR footprint and broader property (the Subject Land). As a result of detailed survey over several periods, both the White-bellied Sea Eagle and Sloanes Froglet have been excluded from being a species credit species for the Project.

Table 3
Assessment of Constraints and Limitations, and Candidate Species Justification

Common Name	Habitat Constraints / Geographic Limitations	Candidate Species Justification
Sloane's Froglet	Semi-permanent/ephemeral wet areas containing relatively shallow sections with submergent and emergent vegetation, or within 500m of wet areas Within 500m of a water body	Retained due to records in locality, and potential habitat, although highly degraded, occurs in crop circle within BDAR footprint and adjacent.
Small Scurf-pea	-	BDAR footprint is highly degraded. Removed as a candidate species.
Swift Parrot	As per mapped areas	BDAR footprint is highly degraded. Species is vagrant. Removed as a candidate species.
Southern Myotis	Within 200m of riparian zone	BDAR footprint is highly degraded. Removed as a candidate species.
Squirrel Glider	-	BDAR footprint is highly degraded. Removed as a candidate species.
Brush-tailed Phascogale	-	BDAR footprint is highly degraded. Removed as a candidate species.
Koala	Areas identified via survey as important habitat	BDAR footprint is highly degraded. Removed as a candidate species.
Superb Parrot	Hollow-bearing trees Living or dead eucalypts with hollows >5cm Trees with >30cm DBH	No hollow-bearing trees. BDAR footprint is highly degraded. Removed as a candidate species.
Regent Honeyeater	As per mapped areas	BDAR footprint is highly degraded. Species is vagrant. Removed as a candidate species.
Bush Stone Curlew	Fallen/standing dead timber including logs	BDAR footprint is highly degraded. Removed as a candidate species.
Square-tailed Kite (breeding)	Nest trees	BDAR footprint is highly degraded. No nest tree apparent. Removed as a candidate species.
Powerful Owl (breeding)	Hollow-bearing trees Living or dead trees with hollows >20cm diameter	BDAR footprint is highly degraded. No hollow-bearing trees. Removed as a candidate species.
White-bellied Sea-eagle (breeding)	Living or dead trees within 1km of river, creek or wetland	Retained due to potential habitat features within BDAR footprint. Requires survey for breeding sites.
Little Eagle (breeding)	Nest trees are large old trees within vegetation	BDAR footprint is highly degraded and no suitable nesting sites. Removed as a candidate species.

3.3.3.5 Avoiding and Minimising Impacts to Biodiversity

The property on which the Quarry would be located has predominantly been disturbed for agricultural activities or existing extractive industry. Only a small area of native vegetation would be disturbed for the ongoing development (the BDAR footprint). It is considered that the Project would have a minor impact on biodiversity values. Regardless, the Applicant has

chosen to incorporate a comprehensive revegetation program for land surrounding the active areas of the Quarry that would see regeneration of riparian and flood plain vegetation progressively occur over the life of the development.

3.3.3.6 Management and Mitigation Measures

EnviroKey (2021) presents a range a mitigation and management measures to reduce the risk of impacts to biodiversity values. These measures are summarised in **Table 4**.

Table 4
Measures to Mitigate and Manage Impacts on Biodiversity Values

Direct impact / prescribed impact	Mitigation measure	Timing
Clearing of native vegetation	• Avoid and minimise clearing impacts to native vegetation where possible. • Ensure that any vehicle, equipment parking or stockpiling areas are identified and positioned to avoid areas containing high biodiversity value. • Install signs including 'No Go Zone' or 'Environmental Protection Area' on limits of clearing fencing. • Identify excluded areas in site inductions. • Implement a tree-clearing protocol for any large trees that are to be cleared.	Prior to and during vegetation clearing
Impacts to surface and groundwater quality due to sediment runoff or contamination	• Implement controls such as sediment fences, mulching or jute matting where appropriate during land preparation activities. • Site vehicles should carry spill kits.	During vegetation clearing, construction and operation
Noise, vibration, lighting, waste and air pollution to adjacent habitats	• Any site-specific management plan should consider measures to mitigate impacts to biodiversity from noise, vibration, waste, light and air pollution.	During construction and operation
Source: EnviroKey (2021) – Table 10		

A Biodiversity and Rehabilitation Management Plan for the Project would be developed in consultation with BCS and would contain proposed strategies for landscape and biodiversity management as well as plans for progressive rehabilitation. This plan would include a Riparian and Wetland Management Plan intended to guide the integration of the created wetlands and natural wetlands and riparian areas in the vicinity of the disturbance area.

A Water Management Plan for the Project would also be developed that incorporates measures to limit erosion and describe sediment controls, including plans for a 2.7m flood levee.

3.3.3.7 Assessing and Offsetting Impacts

The following presents a summary of the outcomes of assessment presented in Section 6 of EnviroKey (2021).

- The Project would impact 0.41 hectares of native vegetation located within the BDAR footprint.

- An additional 27.43ha of previously cleared land would be used for the development.
- It is unlikely that the Project would have an adverse indirect impact on adjacent areas of vegetation and habitat (from edge effects, noise, or dust). The closest feature is an oxbow wetland and measures are proposed to limit impacts to this wetland feature.
- There are no prescribed biodiversity impacts relevant to the Project.
- A range of proactive and adaptive management measures are proposed to limit potential impacts to biodiversity.
- Serious and Irreversible Impacts (SAII) are not expected from the Project. No flora or fauna species are identified as an SAII entity in the *Guidance to assist a decision-maker to determine a serious and irreversible impact* (DPIE, 2019).

3.3.3.8 Credit Calculation

It is noted that, one ecosystem credit of PCT 5 would be required for the Project. A summary of the offsetting obligations for the Project is provided in **Table 5**. No species credit species are relevant to the BDAR footprint.

Table 5
Summary of Ecosystem Credit Requirements

Veg/Mngt zone No.	Plant Community Type	Condition	Area impacted	VIS# – before development	VIS# – after development	Credits required
1	PCT 5	Low-Moderate	0.041	22.2	0	1
					Total number of ecosystem credits	1
# VIS = Vegetation Integrity Score Source: EnvirooKey (2021) – Table 11						

A copy of the BDAR was submitted to BCD on 2 November 2021 (case number 00021174). In email correspondence dated 3 November 2021, BCD commented that assessed credit obligations were consistent with the Biodiversity Assessment Method (2017). No changes to the BDAR have been made since that date.

3.3.4 Groundwater

3.3.4.1 Introduction

The Groundwater Assessment for the Project was prepared by Water Technology Pty Ltd (Water Technology) and included as Part 2 of the *Specialist Consultant Studies Compendium* that accompanied the EIS. This assessment considered the predicted volumes of groundwater entering the proposed extraction areas and the local and regional groundwater system response to the Project (i.e. induced drawdown, changes to standing water levels). The Groundwater Assessment was supported by numerical modelling that applied available hydrogeological, river

and climate data. The predicted inflows were used to assess possible drawdown impacts for groundwater users or groundwater dependent ecosystems (GDEs) and possible changes to groundwater quality and to the hydrological regime of the Murray River. The assessment of groundwater impacts was closely associated with existing and ongoing irrigation of the broader property managed by the Applicant. Historically, water that has collected in the extraction areas has been drawn under licence for irrigation activities which has closely tied extraction activities and the generation of groundwater inflows with use of groundwater for irrigation.

The Groundwater Assessment has concluded that there is limited risk that groundwater drawdown would impact registered bore users as the Quarry is surrounded by the Murray River and Black Swan Anabranch and therefore drawdown would be unlikely to extend beyond the property boundary and would not impact privately-owned groundwater bores. It is acknowledged that there is surface water and groundwater interaction in this location. Irrigators that draw groundwater from the Upper Murray alluvial aquifer contribute to the flux of water in both directions (by using water that would otherwise travel towards the river or by causing water to be drawn from the river towards the aquifer). Potential impacts to the Murray River would be limited as the predicted volumes of groundwater inflow represent a fraction of the water that flows in the river each day. Potential impacts to groundwater quality would be managed through a Water Management Plan and be consistent with quarrying operations across NSW.

Following public exhibition of the EIS and Government agency review of the assessments, a series of recommendations were provided by the Department of Planning Industry and Environment - Water (DPIE-Water). These focused on the estimates of the groundwater use requirements of the Project with no specific issues raised regarding the prediction of potential impacts to groundwater users or GDEs. A key recommendation was to commission an independent peer review of the Groundwater Assessment.

Mr Daniel Barclay of hydrogeologist.com.au was engaged to undertake an independent peer review of the numerical modelling undertaken for the Project to establish whether the modelling was 'fit for purpose'. Water Technology subcontracted WatSec Environmental (WatSec) to undertake groundwater modelling that updated the previous modelling and draft a standalone groundwater flow model report documenting the methodology, inputs, build and results of the numerical modelling (WatSec, 2022). Personnel from WatSec were involved in the initial modelling for the Project and were therefore familiar with the existing modelling and outcomes. The process and outcomes of groundwater modelling were moved from the main Groundwater Assessment and presented in a standalone appendix to an updated *Groundwater Impact Assessment*. This updated *Groundwater Impact Assessment* is presented as **Appendix 7** and referred to hereafter as Water Technology (2022) with the numerical groundwater flow model report prepared by WatSec provided as Appendix A of Water Technology (2022). Appendix B of the updated *Groundwater Impact Assessment* present the results of Mr Barclay's final peer review of WatSec (2022) that concludes the modelling is 'fit for purpose'.

The updated *Groundwater Impact Assessment* was prepared by Mr Rohan Baird (BEnvSc [Hons] [Hydrogeology]), Principal Hydrologeologist of Water Technology, whilst the numerical modelling was undertaken by Mr Nick Watkins (BAppSc [Applied Geology]), Principal of WatSec. Third-party peer review modelling was undertaken by Mr Daniel Barclay (BAppSc [Hons] [Geology, Hydrogeology]), Principal Hydrogeologist at hydrogeologist.com.au.

The following subsections present the outcomes of the updated *Groundwater Impact Assessment* based on the numerical modelling undertaken by WatSec. The final peer review conclusions are also summarised.

3.3.4.2 Water Access Licence Entitlements

The following water licences associated with the *Upper Murray Groundwater Source of the Water Sharing Plan for the Murray Unregulated and Alluvial Water Sources 2011* are held by the Applicant.

- Water Access Licence 29975 – 500 shares
- Water Access Licence 29969 – 568 shares
- Water Access Licence 29930 – 890 shares
- Water Access Licence 29915 – 1 500 shares

A total of 3 458 shares are available within the Upper Murray Groundwater Source. These water access licences are currently associated with the Applicant's irrigation activities within the region and would be available for the Project water use requirements.

3.3.4.3 Assessment Methodology

A summary of the existing groundwater setting is presented in Section 6.3.2 of the EIS. The key changes to the modelling approach adopted by WatSec included the following.

- A new modelling code was used for the modelling (MODFLOW 2000).
- WatSec applied parameter assumption testing using the PEST program.
- Transient calibration occurred over an extended period to include periods of observed data (in 2018) so that a better understanding of inflows was gained.

The assumed site and operational geometry, geological and aquifer layering and Project sequencing is unchanged from the original assessment. The assessment was also undertaken with an assumed irrigation demand of up to 7.3ML per day (based on previous advice from the Applicant) or 2 664ML per year. The irrigation demand is not the subject of assessment, but peak demand gives on indication of likely groundwater inflow management (and lack of constraints for beneficial use of this water). Current irrigation practices are to draw water from the Stage 2 extraction area.

The groundwater model was constructed using the United States Geological Survey (USGS) MODFLOW-2000 model code in the PMWIN platform (Chiang and Kinzelbach, 1998). The parameter estimation program PEST (Doherty, 2000) was used for the model calibration stages to estimate key specified hydraulic parameters based on optimising the match between observed and modelled groundwater head data.

The model extent and inputs were essentially unchanged from the initial modelling exercise and comprised of the following.

- A length parallel to the river valley of 12km and a width of 10km.
- Model cells sizes ranging from $100m^2$ distant from the Quarry Site and $50m^2$ in the vicinity of the Quarry Site (the middle of the model domain).

- Two layers were developed to represent the Shepparton Formation and the Lachlan Formation with varying aquifer parameters.
- River cells were used in the model to represent the Murray River channel and the Black Swan Anabranch.
- Drain cells were used to represent the existing extraction voids with drain hydraulic conductance set at 1 000 m^2/d.
- Basement areas were set as inactive to represent the relatively impermeable basement geology.
- General head boundaries were assigned to the upstream (southeastern) and downstream (northwestern) edges of the model domain to establish and maintain the groundwater flow field across the model domain.
- Details of recharge (rainfall), evaporation and evapotranspiration were presented based on SILO data.

While the inputs to modelling were unchanged, further details of the model structure and conditions were presented in WatSec (2022) to support the approach taken. This was a key recommendation of the peer review completed by hydrogeologist.com.au with the more detailed explanation of inputs now providing a greater justification for the modelling approach and confidence in the outcomes.

3.3.4.4 Model Objectives

The Stage 2 numerical model was developed to represent the local and regional groundwater system and to meet the following key objectives that are commensurate with a Class 1 / Class 2 model confidence level classification.

1. Predict average annual groundwater inflows to the proposed extraction areas to establish the Project's water licensing obligations.
2. Predict the extent, magnitude and implications of groundwater drawdown associated with groundwater inflows to the proposed extraction areas.
3. Predict the average annual discharge of surface water into the shallow groundwater system as a result of the Project.
4. Predict the long-term groundwater recovery following the cessation of operations and the pit lake water levels.
5. Estimate the long-term pit lake recovery levels following cessation of quarrying operations and provide data for estimating the possible long-term salinity within each pit lake.

3.3.4.5 Model Calibration

A detailed overview of the model calibration undertaken by WatSec (2022) is presented in Section 8 of the modelling report and includes a sensitivity analysis of the adopted modelling parameters. The modelling was calibrated to local conditions using measured water levels in

local monitoring bores for the period October 2012 to April 2018. A parameter estimation program (PEST – Doherty, 2000) was used to run the calibration model and optimise model parameters.

3.3.4.6 Modelling Results

Following calibration, WatSec modelled the proposed 30-year extraction sequence of the Project that would occur across four stages, as follows.

- Stage 1 – western (existing) pit expansion, approximate area of 7ha.
- Stage 2 – eastern (existing) pit expansion, approximate area of 6ha.
- Stage 3 – future pit, approximate area of 4ha.
- Stage 4 – future pit, approximate area of 25ha and then split into two further stages (4ab and 4cde) as presented in **Figure 7**.

The model results obtained for estimated pit groundwater inflows at final pit depths are presented in **Table 6**. The modelled interaction between the Murray River and the aquifer is also presented in **Table 6** with an indication of peak draw from the river into the aquifer as a result of the quarrying activity. It is notable that up to 2 664ML of water may currently be drawn from the extraction areas to supply irrigation demand. Compared to inflow predictions of up to 1 776ML per year, the effect of proposed extraction is likely to the unchanged.

Figure 8 presents the predicted drawdown during operations in the Shepparton and Lachlan formations (that is Layer 1 and Layer 2, respectively, of the groundwater model).

A 50-year recovery period was modelled to determine the long-term change to groundwater drawdown and predict evaporative loss from each extraction area post-quarrying.

Table 6
Predicted Groundwater Inflow by Stage

Stage	Duration (years)	Peak Inflow (ML/d)	Peak Inflow (ML/yr)	Peak Modelled Effect on Murray River / Aquifer Interaction (ML/yr)
Stage 1	2	1.94	707	312
Stage 2	2	1.89	691	314
Stage 3	3	2.00	731	337
Stage 4ab	3	3.40	1 243	591
Stage 4cde	20	4.86	1 776	1 002
Source: WatSec (2022) – modified after Table 13				

Figure 9 presents the predicted drawdown post-extraction (at Year 50) in the Shepparton and Lachlan formations (that is Layer 1 and Layer 2, respectively, of the groundwater model). **Table 7** presents predicted evaporative losses post-extraction and provides an indication of post-quarrying water access licence requirements for the proposed final landform.

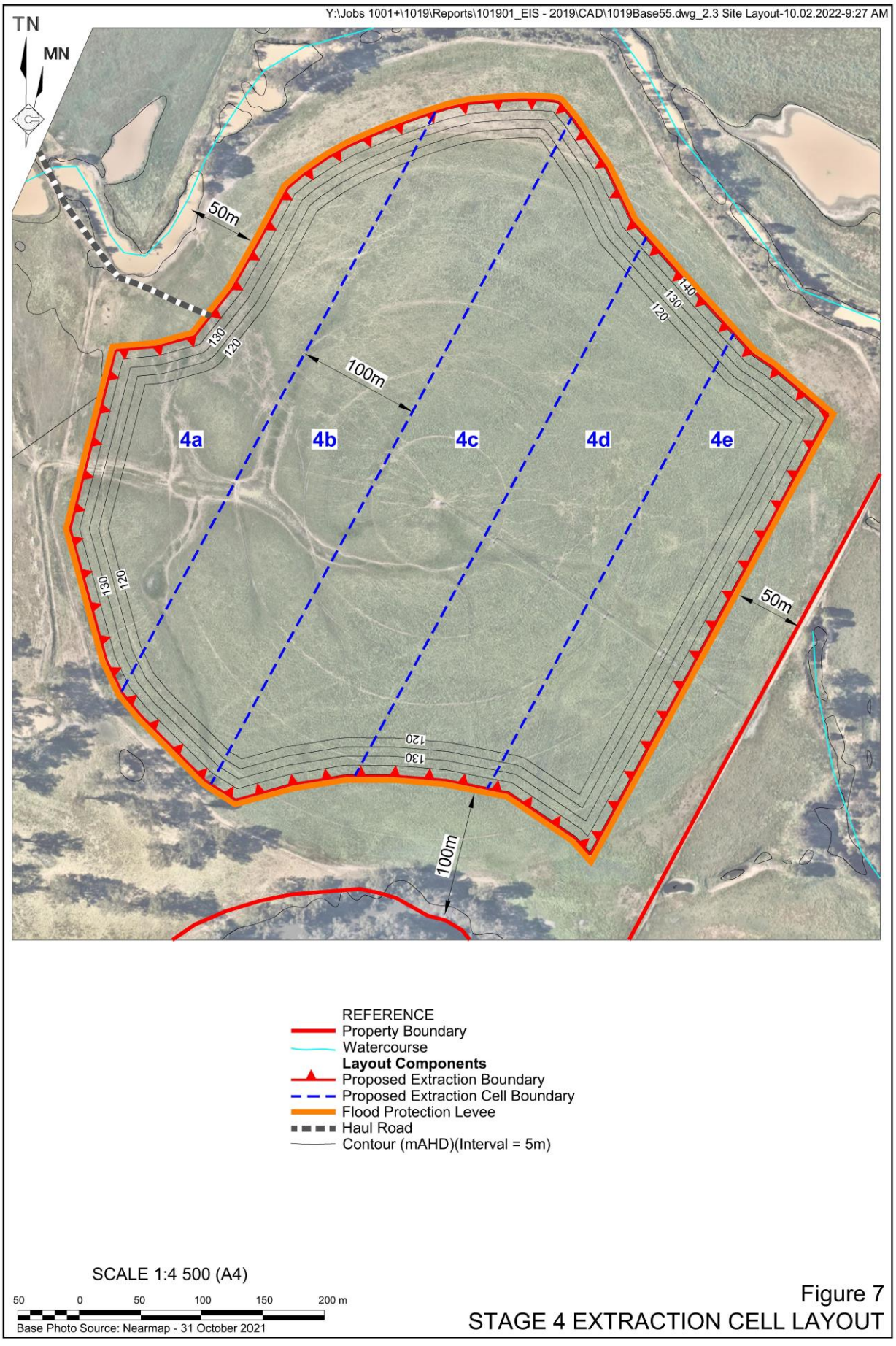


Figure 7
STAGE 4 EXTRACTION CELL LAYOUT

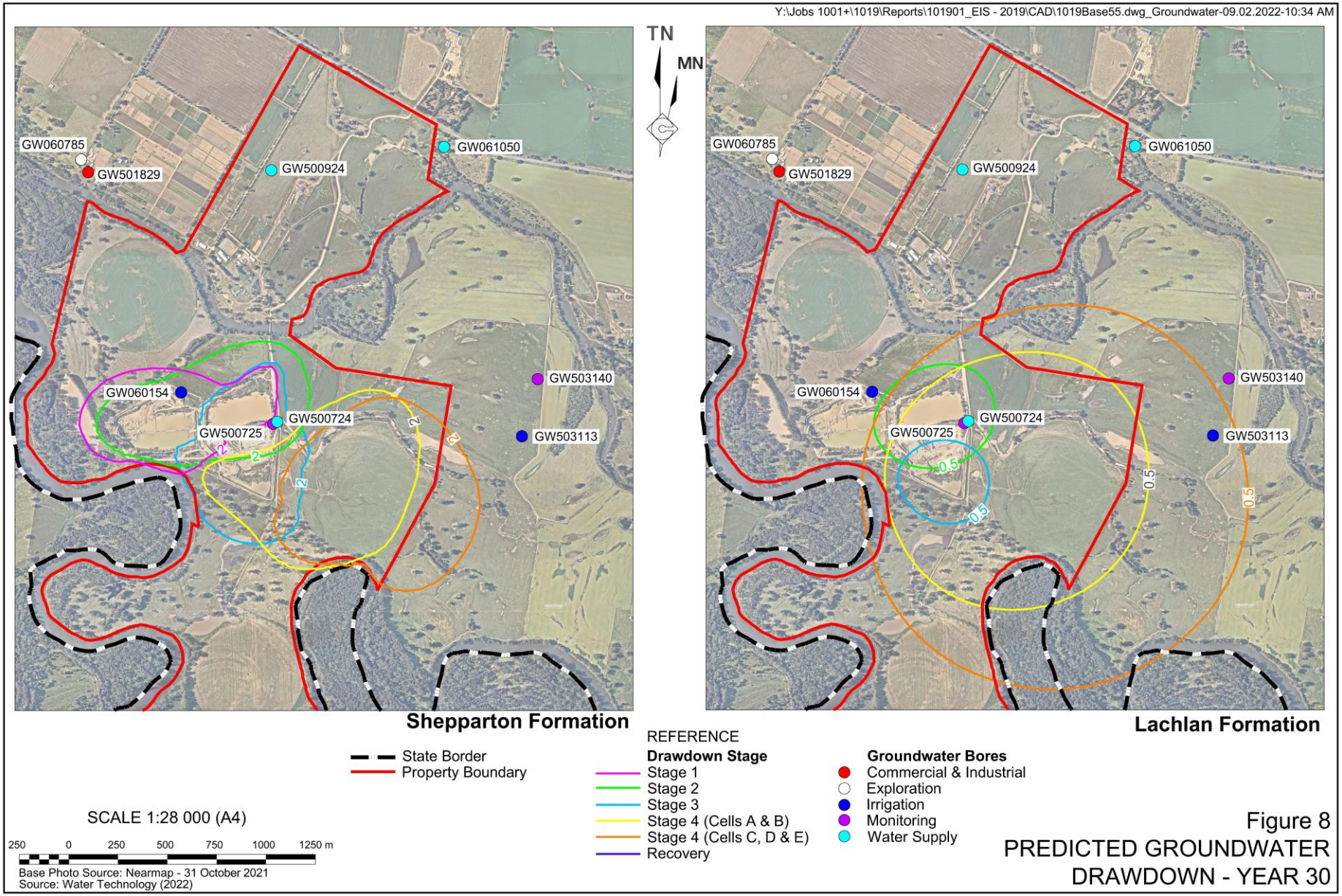


Figure 8
PREDICTED GROUNDWATER DRAWDOWN - YEAR 30

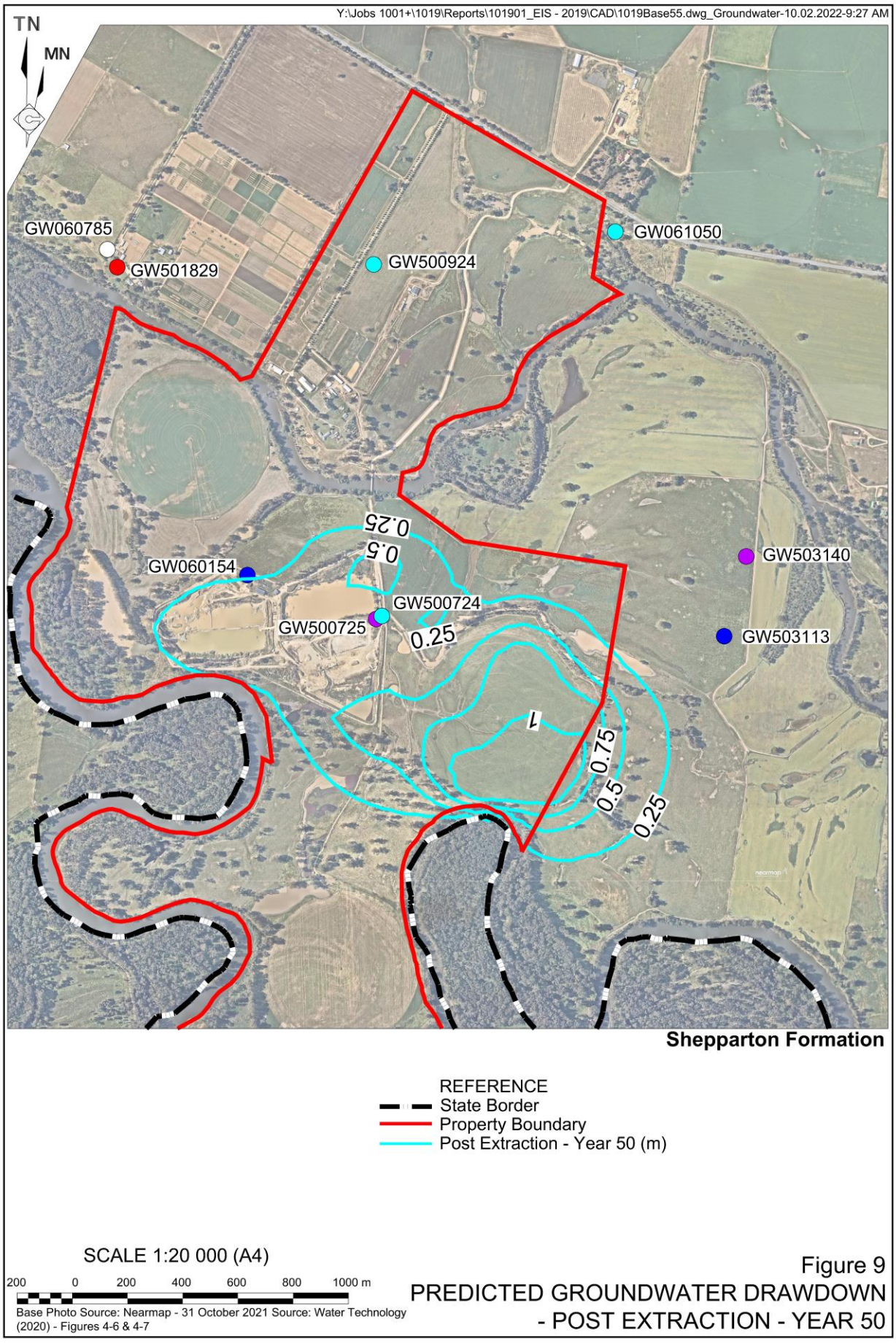


Figure 9
PREDICTED GROUNDWATER DRAWDOWN - POST EXTRACTION - YEAR 50

Table 7
Predicted Evaporative Loss by Stage – Post-Quarrying

Stage	Area (ha)	Evaporation (ML/d)[1]	Evaporation (ML/yr)[1]
Stage 1	7	0.065	24
Stage 2	6	0.056	20
Stage 3	4	0.037	14
Stage 4ab	8	0.074	27
Stage 4cde	16	0.148	54
Total	**41**	**0.380**	**139**
1 Nett evaporative loss of 0.9mm per day assumed based on available SILO data			
Source: WatSec (2022) – modified after Table 14			

3.3.4.7 Assessment of Impacts

The assessment of impacts to groundwater setting is presented in detail in Section 7 of Water Technology (2022). The following presents a summary of the assessment outcomes.

Water Licence Requirements

- The maximum predicted annual licensing groundwater dewatering and evaporation requirement for the Project is 1 776 ML per annum, which occurs in year 30. The Applicant holds sufficient groundwater entitlement to cover the predicted groundwater use requirements.
- It is predicted that an annual allocation of 139 ML per year would be required to cover post-quarrying evaporation loss. This licence allocation may be 'retired' or allocated against the land in perpetuity to account for evaporation from wetlands in the final landform.
- A maximum of 1 002ML per year is predicted to be drawn from the Murray River as a result of surface water / groundwater interaction. This impact is considered to be consistent with current irrigation-related draw at the property and at neighbouring properties that draw groundwater from the highly connected system. Water Technology (2022) note that the Long-term, Average Annual Extraction Limits (LTAAEL) established in the *Murray Alluvial Groundwater Sources Order, 2020* for the Upper Murray Alluvium water source has been established with an understanding of interaction and therefore accepted impacts associated with the highly connected surface water resources and groundwater resources. For this reason, a water access licence in the Murray Unregulated River Water Source is not considered necessary for the Project.

Private Groundwater Users

- Assessment of the drawdown extent and magnitude for private bore users shows that drawdown is less than 2m at all registered bores and therefore satisfies the requirements of the *NSW Aquifer Interference Policy* (2012).

- Drawdown of up to 0.5m is predicted at wells GW503113 and GW503140 during Stage 4(cde). The location of these registered bores are indicated on **Figure 8**. Bore GW503140 is listed as a monitoring well and its status is abandoned, while bore GW503113 is listed as an operational irrigation bore. Records for GW503113 indicate it is 54m deep with a reported standing water level of 4m and a yield of 30L/s. Given the available drawdown in this bore of around 50m and the high yield, the proposed operations are unlikely to have any noticeable impact its operation. Once dewatering ceases, the drawdown at this location would reduce.

Groundwater Dependent Ecosystems

- Water Technology (2022) identifies potential aquatic and terrestrial GDEs including high priority GDEs (as listed in the *Water Sharing Plan for the Murray Unregulated and Alluvial Water Sources 2011*) are present in the vicinity of the Quarry Site. Aquatic GDEs are associated with the Murray River and some wetland areas, though do not correspond well with previously disturbed areas of the Quarry Site (possible indicating the age of mapping). Terrestrial GDEs are likely to be riparian vegetation associated with the vegetation community *River red gum herbaceous-grassy very tall open forest* (PCT 5) identified along the Murray River and Black Swan Anabranch. The groundwater modelling indicates that due to the bounding of the Murray River and Black Swan Anabranch the drawdown effects in the Shepparton Formation are largely constrained to an area between these water bodies. Within this area, drawdown contours extend to the fringes of some identified GDEs. Within the nominated 100m buffer between the Murray River and the extraction stages, the groundwater levels are predicted to drop off quickly as development progresses to the final extraction depth. The expected drawdown is in the order of 10m in areas adjacent the proposed Stage 4 pit (land closer to the extraction area). Drawdown is expected to be much lower towards the river itself. Depending on the degree of reliance these vegetation communities have on the groundwater system, it is possible that some level of localised effect may be felt on GDEs directly adjacent the pits. It should also be noted that extraction areas would only be dewatered to suit extraction scheduling. At an extraction rate of 330 000tpa, it is unlikely that the extraction areas would be maintained in a dry state with some level of recovery expected in intervening periods which may bring water levels back into the rooting depth of remnant terrestrial GDEs.

  The principal mitigation for this impact would be the proposed revegetation program outside of disturbed areas of the Quarry Site as presented in **Figure 4**. This program would focus on riparian areas between the Quarry Site and the Murray River that have historically been cleared for agricultural use. These riparian areas generally correspond with areas of greatest predicted drawdown as well as the mapped GDEs. The objective of this program is to provide suitable buffers to the Murray River, enhance the biodiversity value of the land historically used for agriculture and improve connectivity in the local landscape.

- Post quarrying, the drawdown extent is significantly reduced (see **Figure 9**) when compared to the Stage 4(cde) drawdown contours (**Figure 8**) and impacts to GDEs are expected to be minimal.

Potential Impact on the Murray River

It is considered that the risks to water quality and water flow in the Murray River as a result of quarrying activities would be low.

- The maximum modelled dewatering volume (Stage 4cde) of 4.86 ML/day incorporates an increase in river leakage from the river to the aquifer and also a decrease in groundwater discharge from the aquifer to the river (total of approximately 2.7ML/day). This is 0.14% of the minimum (winter) daily river flow at Howlong of 2 000 ML/day (based on 2019 data which is considered representative of historical river flow), and 0.04% of the average daily flow (for 2019) of approximately 7 000 ML/day.
- Based on the numerical groundwater modelling, the nett effects of evaporation would result in the final voids establishing as evaporative sinks with levels being maintained below river level. Therefore during operations and post-quarrying, the flow gradient is expected to be from the Murray River to the pits and hence water quality impacts on the Murray River are considered unlikely.

One of the Applicant's commitments for the Project is to reinstate a 100m buffer between the existing Stage 1 extraction area and the Murray River. The rationale for this activity is to establish a vegetated area that enhances biodiversity, ensures stability and minimises erosion potential. This would enhance riparian conditions for the Murray River.

Post-Extraction Salinity

Post-extraction drawdown due to natural evaporation is predicted from the extraction stages but would remain limited to the boundaries of the Murray River and the Black Swan Anabranch. As the final wetlands are drawing water through evaporative pressure they would naturally act as groundwater sinks. There may be a risk of intensification of salts in the water if it not continually refreshed. The final strategy to manage post-quarrying water quality would be described in the Closure Strategy for the Project, however, may involve the following.

- Removal of flood levees and construction of appropriate structures to support flood water refresh of water. The final landform would be developed in a manner that limits the risks of erosion in the final landform.
- Continued extraction of water for irrigation in a balanced manner that takes into consideration the volume of stored water.

3.3.4.8 Independent Peer Review

An independent peer review of the numerical groundwater model for the Project was undertaken by Mr Daniel Barclay of hydrogeologist.com.au and is presented as Appendix B of the updated *Groundwater Impact Assessment*. This peer review considered the numerical modelling against the Australian Groundwater Modelling Guidelines (Barnett et al., 2012), the NSW *Aquifer Interference Policy* (2012) and the Secretary's Environmental Assessment

Requirements (SEARs) issued for the Project. The peer review process was conducted in a staged manner with the initial stage identifying several areas in the model report where additional information was required to fully assess the suitability of the model for impact assessment purposes.

The peer review concludes the groundwater model is 'fit for purpose', however notes limitations with the existing model, particularly concerning the application of site-specific data which was not readily available for the assessment. Ultimately, this was not considered to limit the applicability of the overall modelling outcomes. A range of recommendations were presented for operational management and monitoring to address the identified limitations.

3.3.4.9 Groundwater Management and Monitoring

The following recommendations provided by the hydrogeologist.com.au relating to groundwater testing, management and monitoring and recalibration of the groundwater model would be undertaken and detailed in a Water Management Plan for the development.

- Groundwater model re-development and subsequent updates within 12 months of commencement and then every three years during operations.
- Monitoring of groundwater levels from site groundwater monitoring bores at a regular time series (for example, 6-hour logger data).
- Site-specific aquifer testing (during bore establishment).
- Murray River level monitoring adjacent to the Project.
- Transient pit water level monitoring.
- Detailed monitoring and documentation of the site water balance management.

These may be added to the post-approval recommendations presented by DPIE -Water that include the following.

- Preparation of a Water Management Plan that includes the following standard requirements.
  - Sediment and Erosion Control Plan
  - Site Water Balance
  - Monitoring and Reporting
  - Contingency Response Plan

  The Water Management Plan would also include the groundwater, surface water and operation gauging sub-plans, water management policy and appropriate trigger levels, water disposal (irrigation) arrangements and schedules, plus management and mitigation measures should trigger levels be reached.
- Protocols would be established to monitor stability of the 100m buffer to the Murray River until the Stage 1 extraction stage stabilises and the groundwater table equalises.

- Protocols would be established describing operational arrangements to reduce and manage water use and reduce potential impact on the highly connected groundwater - surface water system.
- A description of the closure licensing management strategy and development of a Closure Plan for the post-quarrying management of wetlands.
- Protocols would be established to accurately meter and monitor water use incorporating ongoing review of actual versus modelled predictions.
- A commitment to comply with the rules of any relevant water sharing plans.
- A commitment that the design, construction and management of works within waterfront land would be completed in accordance with the *Guidelines for Controlled Activities on Water Land* (NRAR, 2018).

These measures would be implemented alongside or in addition to the commitments made in the EIS (see Section 6.3.4) relating to water management. These measures are replicated here for ease of review.

- Utilise groundwater removed from extraction stages for irrigation of agricultural activities on the Property or neighbouring properties
- Continue to balance water levels and irrigation demand in extraction stages as these are progressively developed.
- Implement a comprehensive groundwater monitoring program as described in **Table 8**.
- Compare groundwater monitoring results to trigger levels provided in the ANZ Guidelines (ANZG, 2018) and thresholds for further investigation, until sufficient data is available to indicate site-specific trigger values.
- Provide for compensatory measures should monitoring indicate results have exceeded trigger levels including:
  - an investigation of impacts to privately-owned water bores and groundwater availability;
  - provision of compensatory measures for the effected landowner including the supplementary water from on-site supply or remedial measures for bore operation; and
  - notification of impacts to the relevant Government authority and reporting on the incident.

Monitoring bores for the groundwater monitoring program would be installed and monitoring commenced once the locations for these bores are approved in a Water Management Plan.

Balance the post-quarrying irrigation schedule in order to balance salinity in the rehabilitated ponds. Post-extraction management of the ponds would be described in a Riparian and Wetland Management Plan that would be prepared for the Quarry to guide the integration of the rehabilitated wetlands and ongoing irrigation requirements.

Table 8
Groundwater Monitoring

Parameter	Monitoring Frequency	Reporting
Dewatering Volumes Including flow meter records and hours for all water pumped from the extraction stages.	When pumping	Annually
Groundwater Level Monitoring A groundwater monitoring network would be established comprising five bores located up gradient and down gradient of extraction to provide information on groundwater levels.	Monthly	Annually
Groundwater Quality Monitoring Groundwater quality monitoring would occur within the groundwater monitoring bore network. The details of the analytes and frequency of monitoring would be set out in the Water Management Plan, although initially it is proposed to monitor the following. • pH • Electrical conductivity • Total suspended solids • Oil and grease. • Total nitrogen	Quarterly, reduced to bi-annual once trigger levels have been established (nominally after 2 years)	Annually

3.3.4.10 Conclusion

The review and update to the groundwater modelling for the Project prepared by WatSec (2022) and assessed by Water Technology (2022) (**Appendix 7**) has resulted in a more refined and accurate prediction of likely groundwater inflows and understanding of the likely groundwater and surface water interactions. The updated modelling assessment has been subject to peer review and found to be 'fit for purpose' to achieve the stated objectives and for a Class 1 / Class 2 model.

The refined estimate of inflows has reduced previous predictions (presented in the EIS), principally through the use of observed data in calibration. This has resulted from more detailed review of available site-specific data which was a recommendation of the peer review. The peer review has considered the updated modelling approach and considers it acceptable.

The outcomes of assessment remain unchanged in terms of the satisfaction of the Minimal Impact Considerations of a highly productive groundwater system under the *Aquifer Interference Policy 2012*. That is, there is no predicted impact to groundwater users and the potential for changes to the groundwater setting in the vicinity of terrestrial vegetation that may partially rely on groundwater would be mitigated by a program of riparian revegetation and maintenance including within an established 100m buffer area from the Murray River in the vicinity of the Stage 1 and Stage 4 extraction areas. There are limited risks to groundwater quality which would be managed through on-site practices that would be described in a Water Management Plan that would be prepared in consultation with DPIE Water and approved for implementation by DPIE.

The groundwater setting in the vicinity of the Quarry is highly connected with the regulated Murray River system. The predicted impacts associated with drawdown are consistent with current understanding of this connectivity and would not significantly vary from approved irrigation practices along the river that draw water from the system.

The peer review has noted that the groundwater model relied upon over the life of the Project would benefit from a greater level of site-specific understanding of the groundwater setting. The range of recommendations for operational management and monitoring have been accepted by the Applicant and included in the commitments for management. These would be specified in a Water Management Plan for the Project. Regardless, the uncertainty relates to the predicted inflows and licence requirements. Sensitivity analysis indicates that impacts would remain acceptable under a variety of outcomes. Monitoring and accounting for groundwater use over the life of the Project and regular review of groundwater modelling would resolve these uncertainties.

3.3.5 Flooding Risks

Comments from BCD on the Flood Risk Assessment prepared by Water Technology (2020b) requested a more detailed and targeted assessment of flood risks that focused on potential risks to upstream receptors. In addition, DPIE Water requested clarification of the potential for increased erosion risk to the floodplain or Murray River due to the changes to flooding characteristics that may result from construction of the levees.

Two supplementary assessments have been prepared by Water Technology in response to the recommendations.

- A letter report was prepared to present a more refined review of flood modelling outcomes and discuss flood risks. The letter report is presented as **Appendix 8** and hereafter referred to as Water Technology (2021a).
- A Pit and Floodplain Stability Assessment was prepared to review the potential geomorphic risks associated with the presence of flood levees in the landform over the life of the Project and consider opportunities to reduce flood risks in the final landform once extraction is completed. The assessment is presented as **Appendix 9** and hereafter referred to as Water Technology (2021b).

3.3.5.1 Flood Risk Assessment

The refined review of flood risks was prepared principally to consider the following.

- A more detailed review and assessment of the potential impacts that the proposed levees would have on the flood patterns at properties surrounding the Quarry Site, vehicle access to the Quarry Site and overland flows.
- A more detailed and targeted impact assessment of the level of flood impact on upstream properties, assets and infrastructure caused by the development of the proposed levees.

The review considered the potential for the levees to change flood flows across the Riverina Highway and at private residences.

In summary, the conclusions to this refined flood risk assessments were as follows.

- The Riverina Highway is located at an elevation much higher than the 1% and 0.5% AEP flood levels. As the afflux caused by the levee will continue to reduce with the distance from the Quarry Site, areas of the highway that are outside the

model boundaries would experience a reduced impact compared to the areas assessed. It is therefore, not expected that the addition of flood levees would have a detrimental impact on the flood levels along the Riverina Highway.

- The model results have demonstrated that it is unlikely there will be a noticeable increase in flood extent as a consequence of the proposed flood levees. This is principally due to the confined nature of flooding within the floodplain. Negligible differences in water level were predicted for upstream and downstream properties located within or near the floodplain.
- In terms of the Quarry Site access, the existing setting is inundated under flood conditions. The modelled addition of 100mm to flood levels would not substantially change flood risks, as access to the Quarry Site would already be restricted in this situation.
- In terms of flood hazard levels, the addition of the flood levels does not significantly change flood hazard under the 1% and 5% AEP flood levels. This change is limited to areas within 1km of the Quarry Site. There would be no change outside the 1km radius and for the site access arrangements.

3.3.5.2 Geomorphic Stability

Water Technology was commissioned to review the flood modelling outcomes for the Project and assess the potential floodplain erosion risks from flood levee construction and consider the likely impacts of removing the flood levees upon closure of the Quarry.

The potential geomorphic risks are influenced by factors at a site scale including the existing channel network and migration through meander bends and anabranch development as well as broader scale impacts associated with anthropogenic changes to the system and river regulation through releases from the Hume Dam. The key geomorphic processes that would influence stability of the setting are anabranch development and bank erosion. Existing anabranch development may be exacerbated or new anabranches develop over time through changes in flow patterns. Bank erosion for the Quarry setting may occur through lateral migration of river system or channel widening.

Water Technology (2021b) identified the key risks for the setting of the Quarry as a result of the change to flood flows caused by the construction of the proposed flood levees as follows.

- Bank erosion through lateral migration.
- Water flow through and into the extraction area causing surface erosion or avulsion. This would occur through knickpoint progression across the floodplain surface and potentially result in abandonment of the existing river channel in favour of the Black Swan Anabranch.
- Groundwater-related instabilities through sub-surface flow. Possible instability through groundwater flow between the river and the groundwater setting have been mitigated through the establishment and maintenance of a 100m between operations and the Murray River.

Water Technology (2021b) considered lateral migration and avulsion risks based on flood modelling outcomes. The investigation concluded that in the absence of any mitigation or management measures there would be risks of both lateral migration and erosion causing an avulsion. However, the following management measures that have been committed to by the Applicant would mitigate risks.

- The construction of the flood levees would be important to limit the potential for flood flows to enter extraction areas and cause erosional damage through the flood sheer stresses and velocities. The levees would prevent flood flows from entering the operating areas for flood levels up to the 1% AEP.
- The proposed establishment of a vegetated buffer at least 100m from the Quarry Site and the river would mitigate bank erosion through lateral migration and limit the possibility of pit capture.
- Revegetation of riparian areas across the floodplain in the vicinity of the Quarry Site to stabilise the surface.

The Applicant is currently proposing to retain the flood levees at site closure while reliance is placed on ongoing irrigation of the broader property to ensure that water is removed and refreshed, and salinity levels are kept closer to natural levels. The indicative final landform is presented in **Figure 5** and includes areas for revegetation, wetland development and the location of levees at closure. However, should irrigation activities cease and therefore not be available at site closure, the flood levees would be removed so that rehabilitated wetlands may benefit from flood flow refresh and subsequent improvement to water quality. Water Technology (2021b) considered the risks of levee removal at closure and note that the key risk would be that of pit capture through knickpoint progression or development of an avulsion during any overland flood flows. Water Technology (2021b) has reviewed this risk and notes that in the absence of the levees, engineering design of the final landform would assist to mitigate erosion risks post-closure and should include plans to:

- maintain water levels as high as possible in the wetlands;
- apply rock armouring and flood flow entry and exit points; and
- maintain and potentially expand vegetated buffers.

Detailed designs for the final landform, including the necessary features to mitigate flood-related erosional risks, would be presented in a Closure Strategy that would be prepared two years prior to closure. A concept closure plan to account for removal of flood levees would be presented in a Closure Strategy to account for the possibility that flood levees are removed from the landform at closure.

3.3.6 Noise

Feedback from the EPA following review of the Noise Modelling Assessment for the Project prepared by Octave Acoustics (2019) includes the following requests.

1. That low frequency noise be assessed in accordance with the Noise Policy for Industry (NPfI) (EPA, 2020).
2. That noise contour plots (isopleths) be provided for all stages of development.

3. Assessment of possible noise impacts to private residences located in Victoria given that the Quarry Site is adjacent to the Murray River which forms the border between NSW and Victoria in this location.

Octave Acoustics has provided a supplementary assessment of noise impact to address the above matters. This letter report is presented as **Appendix 10**. The outcomes of this assessment is presented in Section 4.1.4 in response to the EPA comments.

4. RESPONSE TO SUBMISSIONS

4.1 GOVERNMENT AGENCY SUBMISSIONS

4.1.1 Federation Council

The feedback from Federation Council (Council) was summarised in three main points at the opening of the Council response.

- Increased traffic movements through the centre of the town potentially affecting the amenity and safety of the residential and commercial areas of the town.
- Increased risk of pollution to the Murray River and therefore of the town's offtake for the reticulated water supply.
- The impact of the proposed levee on the behaviour of floods and the impact of this on surrounding properties.

The following subsections address these concerns and others provided by Council in its submission.

Overall, it is considered that the Project would continue to provide benefits to the region through economic stimulus associated with job creation and the sourcing of consumables. This outcome along with benefits to regional and State infrastructure and construction projects is acknowledged in the Council submission. A range of mitigation and management measures (summarised in **Appendix 2**) would be implemented over the life of the Project to protect local amenity and the environmental values of the Murray River. These measures would be given legal force through conditions of consent.

Representative Comment(s)

Council's concerns are in relation to the impact on the amenity of Howlong and the residential areas in particular, and the impact on safety, in Hawkins Street in particular, with the current angle parking, meaning people reverse out already into a busy road at times. There is no width for a parking/entry lane to the main traffic.

Response

The Quarry has been operating in its current location over many years and the operators and drivers are aware and considerate of the community use of the road in the vicinity of the Howlong centre.

It is important to acknowledge that the Riverina Highway is a State highway. These routes are managed and maintained by the NSW State Government in recognition of their importance for regional transportation activities such as freight and in the case of the Quarry, the movement of construction materials. In many cases, these roads pass through towns and have traditionally drawn visitors to these areas either for short term periods (food or rest) or overnight for longer haul journeys. Where the volume of traffic increases to the extent that traffic may disturb the amenity of a town, the State government may consider developing a bypass. This has been the case in areas of NSW such as Karuah on the NSW Central Coast and the long proposed bypass of Tenterfield in northern NSW (not yet confirmed). The Quarry would join the Riverina Highway directly and therefore does not need to use local roads in Howlong to access the majority of its markets in NSW and Victoria.

Assessment of potential impacts to pedestrians and road users in the village of Howlong has involved technical review of the following matters.

1. The existing traffic levels and traffic composition using the Riverina Highway through Howlong and proposed additional traffic.
2. Assessment of the change to road noise generated by heavy vehicles passing through Howlong.
3. Assessment of amenity issues such as the community's ability to freely access roads and generally carry on with their lives.

Traffic Levels

The relevant statistics concerning the existing traffic, proposed traffic and traffic levels projected into the future are presented in Section 6.2 of the EIS and in the Road Transport Assessment prepared by TTPP (2020a). In summary, it is predicted that traffic generated by the Quarry operation would contribute:

- 2.6 % of daily traffic and 18.3% of daily heavy vehicles on the Riverina Highway to the west of the Quarry.
- 4.0% of total daily traffic and 14.5% of daily heavy vehicles on Sturt Street to the south of the Riverina Highway.

This is projected on the basis of 106 vehicle movements per day (26 light and 80 heavy vehicles) and a peak of 10 heavy vehicle movements per hour (one truck every six minutes). The hourly peak of heavy vehicle movements has been reduced in consultation with TfNSW from a peak of 12 vehicles to 10 vehicles.

For a single heavy vehicle passing through Howlong, the same constraints that apply to all heavy vehicles that use the road would continue to apply. That includes creating space for people trying to park, courteous treatment of vehicles parking in that location and being mindful of actions that may generate noise.

Road Noise

Assessment of road noise generation predicted that the Project would result in a negligible (1dB(A) during daytime operations) increase in road noise. In practical terms, a 1dB(A) increase or change in noise level is an imperceptible change. The noise of a single truck passing would remain consistent with the noise generated by heavy vehicles that currently use the road.

Community Amenity

The feedback from some members of the community concerning the proposed traffic that would be generated by the Quarry also highlights amenity concerns. Assessment of physical amenity issues such as traffic levels, noise and dust generation all indicate only minor changes to the local setting. It is acknowledged that the existing number of heavy vehicles passing through Howlong would increase. This has been perceived as a significant change for some members of the community. It should be reiterated that traffic generation for the Quarry would contribute only 2.6% of total traffic on the Riverina Highway to the west of the Quarry and a peak of no more than 5 laden loads per hour (10 movements including the return) which would mean a truck passing every six minutes on average or every 12 minutes in one direction.

It should also be acknowledged that the Quarry traffic would be managed under a Driver's Code of Conduct and Traffic Management Plan. A Driver's Code of Conduct has been prepared for the Quarry (see **Appendix 11**) but this document would be updated prior to commencement of the Project in consultation with DPIE, Council and TfNSW to ensure it meets expectations. Vehicle movements would need to be monitored each hour to ensure that peak limits are not exceeded. The Applicant would also be restricted by conditions of consent that are subject to audit and compliance actions. It is not known what level of traffic management the other heavy vehicles on the Riverina Highway (that are not entering the Quarry) would be subject to. For drivers that are transporting material for the Quarry, they risk losing their jobs or contracts with the Applicant if they do not satisfy requirements.

Representative Comment(s)

From the study undertaken in March 2012 the daily average vehicles accessing the site, were 42 vehicles on a weekday with 9 being heavy vehicles (33 being light vehicles). Under section 4.1 the project has assumed, for the purpose of this assessment that there will be 26 light vehicle trips per day and 80 heavy vehicle trips per day. Based on the base line studies, the number of light vehicles entering and exiting the site is reducing by 7 light vehicle movements, even with an increasing work force of 8-10 .

Also in the base line data outlined in table 4.3, the growth with no project is far below what has been recorded for access at the site.

Further clarification on the number of vehicle movements and percentage of heavy and light vehicles is requested, as is further work on the movements of existing vehicles in Hawkins Street, around the compact, yet busy, e.g. Saturday mornings, Howlong Central Business District.

Response

The above comments on the Road Transport Assessment prepared by TTPP (2020a) have been reviewed and a detailed response presented in a letter report prepared by TTPP (2020b - see **Appendix 12**). In summary, the following responses are provided on this matter.

1. The future traffic volumes reported on the Quarry Access Road in Table 4.3 of the Road Transport Assessment (TTPP, 2020a) included only the Quarry-generated traffic and so inadvertently excluded those vehicles which were using the access road during the surveys as part of agricultural activities. Agricultural activities occur on the broader property and are connected to the property to the north of the Riverina Highway. This over-presents Quarry traffic on the road and therefore created the discrepancy identified by Council.
2. Council's comments refer to an additional 80 heavy vehicle movements per day and additional workforce of eight to ten persons. However, it is noted that existing approved activities feature an average of 10 heavy vehicle movements per day and currently employs a maximum of eight people. Therefore, the change in traffic levels is not as great as anticipated.
3. Surveyed traffic levels have been reviewed for the Howlong business district on Saturday mornings. TTPP (2020b) noted that although total traffic levels are consistent with or lower than average weekday traffic, the proportion of heavy vehicles is lower. The Project may contribute up to 10 heavy vehicles to traffic in

any hour. Therefore, the proportion of heavy vehicles would increase under the Project. However, the peak of 10 movements would not occur every hour or every Saturday and it considered a minor change to traffic levels.

It is noted that since exhibition of the EIS, the Applicant has committed to reduce the maximum hourly limit of heavy vehicle product despatch to five laden loads per hour (10 movements). The daily maximum of 40 laden loads (80 movements) is unchanged.

Representative Comment(s)

The hours of heavy vehicle movement is of particular concern to the council with heavy vehicle traffic movements to be between the hours of 6.30am and 10.00pm. The impact on the amenity of the residential areas with frontages to the Riverina Highway, Hawkins Street and Sturt Street is of particular concern. In accordance with the Protection of the Environment Operations Act 1997 and the Protection of the Environment (Noise Control) Regulation 2017, the noise emanating from the heavy vehicles is to comply. The limiting of engine brakes and other loud operational noise from the heavy vehicles is to be limited in the urban areas of Howlong to maintain the amenity of the town.

Response

It is acknowledged that by presenting a proposal for additional heavy vehicles on a road used frequently by the community, there is likely to be fears in the community of loud and constant truck activity. However, as noted in the previous response, at a peak of operations the Quarry is predicted to generate 2.6% of daily traffic and 18.3% of daily heavy vehicles on the Riverina Highway to the west of the Quarry. The additional limit of 5 loads per hour (10 movements), restricts hourly traffic levels to ensure that transportation is evenly spaced across the day. These values represent peak activities and not average traffic levels. For example, a peak of 10 movements in an hour can only be maintained for eight hours before the daily maximum of 80 movements is reached. The proposed operating hours cover 15 hours and therefore average traffic levels are likely to be much lower.

The Quarry is located on a rural property that is separated from neighbours and has direct access to a State highway (the Riverina Highway). Further, the Riverina Highway is designed and intended to accommodate freight traffic in the region, including construction materials.

Assessment of road noise generation predicted that the Project would result in a negligible (1dB(A) during daytime operations) increase in road noise. In practical terms, a 1dB(A) increase or change in noise level is an imperceptible change. The noise of a single truck passing would remain consistent with the noise generated by heavy vehicles that use the road now.

The proposed operating hours are consistent with many extractive industry operations of this nature. The morning hours permit deliveries to concrete batching facilities to re-stock raw materials used in early morning production. Later hours are intended to provide flexibility to supply road maintenance works and also to ensure that concrete batching facilities are ready to commence efficiently in the morning.

The proposed operating hours are therefore considered appropriate given the isolated location of the Quarry Site, direct access to the Riverina Highway, low total contribution to traffic and predictions of road noise generation.

Representative Comment(s)

There are other areas where further clarification is sought includes:

- *Width of the access road to the site, noted in the study as being 12m wide but measured at the entrance from Riverina Highway as being 6m wide.*
- *The data assumptions and base line figures.*
- *The updated figures and the impact on the treatments for the access and egress points for the site, and the corner of Hawkins Street, Riverina Highway and Sturt Street Howlong.*
- *Adequacy and safety of the bridge over the Black Swan Creek.*
- *The impact of light on drivers entering and exiting the site due to the east west orientation of the access point.*

Response

These comments are addressed sequentially as follows and also detailed in the letter provided by TTPP (2020b – see **Appendix 12**).

1. The Road Transport Assessment (TTPP, 2020a) indicates that the Quarry Access Road is generally 12m wide. The entrance does narrow to 6m. However, it is noted that the upgraded intersection would be undertaken in accordance with the design presented in **Appendix 3**. In consultation with TfNSW, it has been agreed that the site entrance be constructed as a 'Rural Property Access' type treatment in accordance with the Austroads Guide to Road Design. The minimum width of at least 6m would allow 2-way movement. The access would also be sealed for at least 30m from the edge of seal of the Riverina Highway.
2. This discrepancy in the data used to predict traffic levels on the Quarry Access Road has been identified and addressed in detail by TTPP (2020b) (see **Appendix 12)** and summarised above in relation to the agricultural activities recorded in traffic surveys and not representative of Quarry-generated traffic.
3. In consultation with TfNSW, an updated intersection design has been prepared for the intersection of the Quarry Access Road with the Riverina Highway (**Appendix 3**). The maximum hourly traffic generation of five laden loads (10 movements in an hour) has been applied (reduced from the previous level of six laden loads in a peak hour).

   With respect to the intersection of Hawkins Street, Riverina Highway and Sturt Street, the intersection is currently approved for use by 25/26m GML B-doubles with no restrictions. Upgrade of the intersection is not considered to be warranted to accommodate heavy vehicles or to accommodate pedestrians.
4. A report on the safety and adequacy of the bridge over the Black Swan Anabranch was prepared by SJ Street & Associates and presented with the EIS as Appendix 7. That report recommended a range of remedial works to be undertaken prior to commencement of the Project but noted that the bridge was suitable for use by heavy vehicles proposed for the Quarry operations (B-Double

vehicles with a gross vehicle mass of 67.5t). In response to this comment from Council, an additional assessment of the bridge was commissioned from Aussie Bridges Pty Ltd with the report on the structure presented as **Appendix 13**. Aussie Bridges completed a structural analysis through modelling using computer software (Bentley's Microstan Advanced software package) and analysis using Tekla Tedds software. The likely impact of a tri-axle vehicle was replicated with independent loads of 22.5t. Physical load testing observed gross vehicle loads of 59t. On the basis of the analysis (modelling and physical), Aussie Bridges considered that the bridge did not require any load restrictions and would continue to be more than suitable to receive loads from B-Double combinations.

A range of recommendations were presented by Aussie Bridges that were mostly consistent with the recommendations of SJ Street & Associates. The recommendations of both documents would be presented in the Traffic Management Plan for the development. In summary, the following management approach would be applied for the bridge

- Any identified sudden changes would immediately be referred to a competent, suitably qualified bridge engineer.
- Undertake annual Level 2 Bridge Condition inspections (e.g. AusSpan) and schedule maintenance programs.
- Limit vehicle speed to a maximum of 5km/hr. Satisfaction of nominated speed limits would be a component of the Driver's Code of Conduct with disciplinary action takes in the event of exceeded speeds.
- Trial speed monitoring consistent with residential street monitors that flash or change colour when speed triggers are exceeded.
- Provide suitable signage on bridge approaches to warn of one-way access, give-way requirements and speed limits.
- Level out approaches in elevation and plan and provide rock beaching retention fill on edges to protect batter slopes from erosion.
- Abrasive sand blast all steelwork to Class 2.5 and paint with a two coat epoxy primer paint system.
- Realign and reclip precast concrete decking planks to edge steel beams- replace missing bolts and clips- all details hot dipped galvanized.
- Provide precast concrete bollards on the approaches each side to control vehicle alignment across the bridge.
- Install suitable low level guiderail each side such as low level pipe railing fixed back to deck, maximum height 1/3 of wheel height.
- Seek a further assessment and plan for bridge replacement within 5 years of the commencement of the Project.
- All work to be carried out by experienced tradesman to current Australian Standards.

The above requirements would be described in a Transport Management Plan that would be prepared in consultation with Council and TfNSW and would be approved by DPIE before the commencement of the Project.

5. It is accepted that drivers accessing the Riverina Highway would at certain times need to account for the time of day or climate patterns in their driving. Section 11 of the Driver's Code of Conduct (**Appendix 11**) identifies these situations including direct sunlight and glare, fog, heavy rainfall and flooding conditions.

   It is however noted that drivers accessing the Quarry currently and those that would be contracted under the Project are professionals and therefore should be considered accustomed to the road conditions in a rural area and be sufficiently experienced to modify their driving practices to suit. Evidence of this is that no accidents have occurred on the Riverina Highway at the current access to the Quarry.

Representative Comment(s)

Details on the impact the proposed levee for stage 4 will have on the flood patterns on properties surrounding the site, vehicle access to the site and overland flows.

The proposal includes the construction of a levee to a maximum height of 2.7 or 147m AHD around stage 4 of the proposal. The study undertaken on the impact of the levee on flood flows only addresses the impact and protection of the operational area of the site.

The documentation states that the impact on floodwaters to the east will be for 4km at a height ranging from 300mm to 5mm, however it does not address if this effects on the Riverina Highway, the access to the site, neighbouring properties or other infrastructure on neighbouring properties. Council requests that additional information regarding the impact on flood waters be provided for both upstream and downstream of the site, and that such information includes the overland flow changes that will be caused by the construction of the levee.

Response

Water Technology was commissioned to prepare a Flood Risk Assessment for the Project (provided as Part 3 of the *Specialist Consultant Studies Compendium*) and relied upon modelling generated as part of that assessment to consider the request from Council. A letter report responding to the queries is presented as **Appendix 8**. The following presents a summary of the assessment outcomes presented in detail in **Appendix 8**.

Flood Risk to the Riverina Highway

The flood modelling outcomes indicate that the maximum increase to flood water levels as a result of the levee construction varies from 30cm just upstream of the Quarry Site to approximately 3cm at a point 4.7km east of the upstream modelling boundary. The flood water level would continue to decrease beyond the modelled boundaries. Afflux is the increase in water level caused directly by an obstruction in the path of flowing water. The largest afflux 500m upstream of the Quarry on the right bank of the Murray River is 4.5cm.

To the east of the Quarry Site (that is, upstream), the Riverina Highway is over 2km from the levees and outside the modelling boundary. However, the level would be expected to decrease from the model boundary and therefore be less than 3cm at the highway. In addition, locations to the north of the Quarry Site may experience a 30cm change in water depth. However, the Riverina Highway is outside of the floodplain in this location and is constructed above the 1% and 0.5% Average Exceedance Probability (AEP) depth and therefore would not be affected by any change in water levels due to the construction of flood levees.

Flood Risk to Properties and Road Access

Water Technology undertook further investigation of flood risk at properties upstream and downstream of the Quarry. The results are presented graphically in **Appendix 8**.

- Upstream of the Quarry, there is limited evidence of potential increase to flood extent or increase to inundation. Importantly, while there may be marginal changes, they are not sufficient to change the flood risk within the property boundary.
- For properties downstream of the Quarry, there are no predicted changes in flood extent with only scattered changes predicted that would not occur at properties.
- In terms of road infrastructure and access, the assessment of existing conditions indicates that the majority of road assets would be inundated (levels greater than 300mm) and therefore safe access would not be possible under current conditions. For the Quarry Access Road, the change in flood extent due to the flood levees would increase water levels by approximately 100mm within the property but this would occur in an area where access would already be limited.

In summary, Water Technology has concluded that it is unlikely that the flood levees to be constructed for the Quarry would cause adverse impacts in terms of flood risks. Where changes would occur, they would be in addition to an environment that is already impacted but most importantly the flood levees would not add to assessed flood risk levels.

Regardless of the above, the Applicant would develop a Site Emergency Plan and protocols to guide personnel in the event of flooding. This will guide management of the site during these periods and provide protocols for the timely evacuation of the Quarry.

Representative Comment(s)

Further details regarding the impact on water quality in the River Murray and the pollution controls that will be employed for the life of the project.

The application is attempting to make the system closed to the remainder of the River Murray System, however the site is located between the main channel of the Murray River and an anabranch – Black Swan Anabranch.

Council request details regarding the additional pollution controls that should be employed during the life of the project. This information is requested to ensure that the water quality is maintained for the health of the aquatic habitat and for the town of Howlong's water supply.

Details regarding the erosion and sediment controls that will be utilised for all stages of the development.

Given the nature of the works on site a detailed erosion and sediment control plan is required for the site for the life of the project.

Response

The risk of uncontrolled discharge from the Quarry Site has been previously identified and has been a key factor in design and planning of the Quarry development. The principal controls for water quality are described in Section 6.4.6 of the EIS and include the following.

- Prepare and implement a Water Management Plan including a description of surface water management procedures.
- Ensure that no water collected within the Quarry Site is discharged to any nearby watercourse. All water would be used for processing, irrigation or on-site dust suppression or would be stored and allowed to evaporate.
- Ensure that all fuel and chemical storage is bunded to 110% of the size of the largest receptacle in accordance with the relevant Australian Standards (currently *AS 1940:2017 The storage and handling of flammable and combustible liquids*).

The Water Management Plan for the operation would also describe programs for water monitoring that would include monitoring of water quality at six monthly intervals within operating stages of the Quarry and also in the Murray River as a reference point.

Given the height of flood levees, uncontrolled discharge would only occur in the most extreme flooding circumstances (water levels greater than the 1% AEP depth). Therefore, no additional controls are considered necessary.

The only erosion and sediment controls that would be implemented for the operation would relate to minor drainage adjacent to the Quarry Access Road. For the remainder of the Quarry Site the presence of flood levees would ensure that all rainfall that falls on disturbed areas is captured internally and stored or permitted to evaporate.

Representative Comment(s)

Details regarding the proposed bushfire protection measures that will be in place for the life of the development.

The land is defined as bushfire prone and is only accessible via one access road and bridge. The bush fire assessment again only defined the impact on the site itself. Details of the proposed Bushfire protection measures that will be employed on-site are to be provided for assessment.

Response

Bush fire hazards are discussed in Section 6.11.3 of the EIS where it is highlighted that the lack of remnant vegetation and absence of fuel loads indicates a low level of bush fire hazard risk. It is proposed that bush fire management would be described in emergency planning documents for the operation. These documents would include a summary of measures such as the following.

- All employees would be trained in the proper use of firefighting equipment held on the Quarry Site.

- Water would be especially set aside for firefighting on site and the on-site water cart made available for firefighting purposes.
- A protocol would be developed for restricting work in vegetated areas during high fire danger periods of the bush fire season (in accordance with the hazard category notifications).
- Procedures for hot works would be developed to prevent ignition sources for a bush fire.
- The local Rural Fire Service would be consulted prior to each bush fire season.
- Site firefighting equipment would be made available to the local Rural Fire Service, if required, in the event of a bush fire on the land surrounding the Site.
- Where needed, firebreaks would be developed and maintained in consultation with the local Rural Fire Service.
- The local Rural Fire Service would be consulted regarding any controlled burns planned by these agencies for asset protection and / or ecological management.

Importantly, ongoing consultation with the local Rural Fire Service would ensure that bush fire planning and management is appropriate for the predicted climatic conditions.

Representative Comment(s)

Details regarding the effect the re- use of the water used in the processing for irrigation on the land capability and the areas where the re-use irrigation water will be applied.

The document states that the water utilised in the processing of the material will be used for irrigation purposes on the site and other sites. There is no detail on the other sites provided and no land capability details regarding the land to be irrigated with this water. Additional information is requested regarding the sites to be irrigated and the land capability, to ensure that the reuse of this water does not adversely impact on land within the Riverine Environment, and that the recharge to the river system will not adversely impact on the river system in the vicinity of the areas irrigated.

Response

The use of water captured in extraction pits for irrigation of crops on the broader property would be a component of water management for the operation. Water that has been used for processing is currently used for this purpose and there has been no indication of damage to crops or land capability. Water used in processing would be temporarily stored before use. This is considered a beneficial use of this water that would otherwise need to be stored until it can evaporate or discharged to the natural environment.

It is noted that irrigation processes are highly controlled in this environment and applied to moisten the surface without generating large volumes of runoff. This a particularly important where water use is heavily regulated through licensing and soil resources have high value. It is acknowledged that water used for irrigation may contain sediment and fine clay particles. However, consultation with the farm operators indicates that this sediment is considered to be of benefit for crop generation. There is a minor risk that water would contain hydrocarbons.

Spill management would occur internally and the risk of hydrocarbons contaminating water is considered the same as that currently present for agricultural activities that use machinery. It is therefore considered that the land capability of areas subject to irrigation would only improve through the availability of water and the possible sediment load.

Representative Comment(s)

Details of the Emergency Management Plan for the overall development.

The site is located essentially on an island within the River Murray System. The site is classified as Flood Prone, Bushfire prone, and with hydrocarbons (fuel) being stored on site, there is an increased risk of pollution to the River Murray system. It is therefore requested that an emergency management plan be developed and approved prior to works commencing on site to address at a minimum, the site's emergency response to the following events:

- *Flooding*
- *Bushfire*
- *Pollution incident*
- *Evacuation of the site for all emergencies*
- *Failure of the onsite sewerage Management System onsite*
- *Bridge Failure*

Response

Should the Project be approved, the Applicant would be required to prepare a Pollution Incident Response Management Plan (PIRMP) under the conditions of an Environment Protection Licence granted under the *Protection of the Environment Operations Act 1997*. The PIRMP would provide a full manifest of the chemicals and hydrocarbons stored at the Quarry Site, and provide the planned responses in the event of an identified emergency occurring, such as spills, fire or flood. This would also include management of on-site septic system.

Further, in consultation with Council, the Applicant would develop plans for safe workplace management that include emergency planning. These plans are not generally included in conditions of consent but required under work health and safety legislation and regulated by the Resource Regulator through mine safety audits and consultation. These plans would include advance warning triggers for site evacuation in the event of bush fire, flood or other emergencies.

In the unlikely event of bridge failure, arrangements would be made to safely evacuate staff and the Quarry Site would be closed until access can be restored.

Representative Comment(s)

Compliance with Building Code of Australia and relevant Australian Standards for services, structure and employee facilities on site.

The increase in operations on the site means that additional amenities and facilities will be required for the workers on site. Approvals for these works and structures are to be sought from Federation Council prior to operations commencing.

Response

All structures, where applicable, will be built in compliance with the Building Code of Australia (the BCA) in consultation with Council. The Applicant expects that few additional facilities would be required as the existing levels of permanent personnel would not substantially increase. The increase in personnel would relate to truck drivers who would not be permanently based at the Quarry. Should an upgrade to the septic system be required, this would need to be approved by Council prior to construction of the system. There is no indication that the requirement to use these services now or in the future would lead to unacceptable environmental risks that would justify refusing the application.

Where a structure is not required to comply with the BCA, the Company would ensure that the structure is built to industry best practice and applicable engineering standards.

Representative Comment(s)

Rehabilitation plan and future use of the site.

The Environmental Impact Statement outlines that the site will be rehabilitated and make up part of the aquatic habitat of the River Murray, however measures of how the site will be rehabilitated has not been provided in any sufficient detail. Prior to works commencing it is requested that an agreement be created and tied to the title of the property requiring the rehabilitation of the site as an aquatic habitat at the cessation of the project, and that the state government hold a bond for the rehabilitation works to ensure that the rehabilitation works are undertaken to a suitable standard.

Response

A Biodiversity and Rehabilitation Management Plan would be developed for the Project and would describe in detail the short, medium and long-term rehabilitation commitments that have been made. This would include performance objectives and criteria and closure criteria for the Quarry Site. The Biodiversity and Rehabilitation Management Plan must be in place over the life of the development and updated to account for progressive development and any changes to rehabilitation outcomes or commitments. Substantial changes to the approved final landform must be sought through a modification to the development consent and the proposed changes justified and then approved by DPIE. Further to this, a Closure Strategy would be prepared for the Project at least two years prior to closure. This document would detail closure elements of the Biodiversity and Rehabilitation Management Plan as well as any stakeholder consultation, updated guidelines or land use strategies that would inform the final land use. This strategy would also present the intended use or removal of flood levees in the final landform.

It is common practice for DPIE to condition the requirement that a bank guarantee be provided to account for rehabilitation of the disturbed areas within the Quarry Site. The bank guarantee would be made out in favour of DPIE and may be called upon in the event that the Applicant fails to achieve the committed rehabilitation standards and is incapable of doing so in the future. The bank guarantee is only returned to the operator once DPIE is satisfied that the closure commitments described in the Biodiversity and Rehabilitation Management Plan have been satisfied.

There is no mechanism available for Quarry operations that would enable future rehabilitation of the land to be placed on the title. It should also be recognised that within 30 years' time the land use preferences of the landowner, Council and the NSW government may have changed and therefore it would be pre-emptive to make any commitments tied to the land title. Regardless, the Applicant intends to proceed with the proposed revegetation works and progressive rehabilitation activities as described in the EIS.

Representative Comment(s)

Upgrade and operation of septic system

A review of council's records indicates that there is an onsite sewerage management system on site for the property. Given the likely increase in vehicle movements and employee numbers, a review of the current onsite sewage management system is to be undertaken to ascertain whether it has the capacity to treat the additional wastewater loads from the development or whether an upgrade to the system will be required. The review is to be undertaken by a suitably qualified person and a report of the findings provided to Council. If any upgrades to the system are required, these are required to be undertaken prior to any works commencing.

Response

It is not currently planned to upgrade the existing septic system at the Quarry. However, should this need be identified in the future any changes to this system would be made in consultation with Council and the EPA.

Representative Comment(s)

Details regarding the waste management plan for the site.

With the increased staffing and vehicle movements to the site the increase in waste generated from the site needs to be addressed. It is therefore requested that a waste management plan be prepared and approved by the Department of Planning, Industry and Environment, Environmental Protection Authority and Federation Council prior to the commencement of operations.

Response

Prior to commencement of operations under the Project, the Applicant would prepare a Waste Management Plan for the Project. The Waste Management Plan would:

- identify the various waste streams produced by the Project;
- provide strategies to minimise waste generation, and maximise reuse and recycling;
- ensure waste generated by the Project is disposed of appropriately; and
- include a trigger action and response plan.

The Waste Management Plan would be prepared in consultation with Council and the EPA and would be approved by DPIE before commencement of the Project.

Representative Comment(s)

Federation Council's Developer Levy

The levy payable will be calculated at 1% of the capital value of the construction works for the overall development. The levy based on the capital value for the project of $5.1 million will be $51,000. Please note all contributions will be payable prior to the approval being enacted.

Response

This is acknowledged and accepted.

4.1.2 Biodiversity Conservation Division (now Biodiversity Conservation and Sciences Directorate and Heritage NSW)

Representative Comment(s)

Based on the current assessment, it is not possible to determine the degree of flood impact on upstream receptors (primarily levels of afflux but also flow, velocity and hazard) and whether this impact will be detrimental.

Recommended Action:

A more detailed and targeted impact assessment is required to effectively determine the level of flood impact on upstream properties, assets and infrastructure caused by the proposed levee development.

Response

Water Technology was commissioned to prepare a Flood Risk Assessment for the Project (provided as Part 3 of the *Specialist Consultant Studies Compendium*) and have been further commissioned to more closely consider risks to upstream receptors. The resulting report is provided as **Appendix 8** and relied upon the modelling generated as part of the Flood Risk Assessment.

The outcomes of this additional review are presented in Section 4.1.1 in response to Federation Council. However, in summary Water Technology has concluded that it is unlikely that the flood levees to be constructed for the Quarry would exacerbate flood risks. Minor changes to flood behaviour would occur but where private properties are concerned these would occur in scattered locations and not at residences. In the vicinity of the Quarry, infrastructure such as the Quarry Access Road would be impacted under existing conditions and the changes associated with the flood levees would not change risk levels to the extent that additional management or mitigation is required. The Riverina Highway is located outside of the flood plain as evident in the existing topographic mapping and flood risks would not change as a result of the flood levees. Where impacts upstream of the modelled boundaries are concerned, it is considered that water level changes would decrease further away from the Quarry and therefore would be less than the 3cm predicted at the upstream model boundary. Water Technology was also commissioned to consider the erosion and pit stability risks associated with the flood levees (see **Appendix 9**). In summary, the proposed levees reduce erosion risk during operation and would be supported by riparian revegetation works. Upon closure of the Quarry Site, the retention of the levees would depend on ongoing irrigation use of water.

It is considered that the flooding risk assessments prepared by Water Technology (2021a and 2021b) provide sufficient justification for the beneficial inclusion of flood levees for the Project.

Representative Comment(s)

The EIS and due diligence report do not demonstrate that the proponent has complied with the Aboriginal cultural heritage requirements for consultation or archaeological assessment stated in the SEARs, consistent with requirements under the National Parks and Wildlife Act 1974.

Recommended Action:

The proponent is required to conduct an assessment in accordance with the:

- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales.*
- *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW.*
- *Aboriginal cultural heritage consultation requirements for proponents 2010.*

Response

In reviewing the feedback from BCD on the Aboriginal Cultural Heritage Assessment (ACHA) it was identified that although the Applicant's consultant considered the assessment adequate, the processes described in the guidelines described above had not been strictly adhered to and therefore it was not possible to confidently support the outcomes of the assessment. A key concern was that Aboriginal community consultation had not occurred as thoroughly as required by the guidelines. It was therefore not clear that appropriate attention had been paid to Aboriginal community views. A new ACHA was undertaken by Landskape Natural and Cultural Heritage Management (Landskape), hereafter referred to as Landskape (2021) and presented as **Appendix 5**. The assessment has been prepared in accordance with the above recommended guidelines. The results of the assessment are discussed in detail in Section 3.3.2.

Aboriginal Stakeholder Consultation

Landskape (2021) undertook Aboriginal stakeholder consultation in accordance with *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010). Notifications were sent on 17 June 2018 to the BCD, NSW Local Land Services, Federation Shire Council, National Native Title Tribunal, Native Title Services Corporation Limited, Albury and District Local Aboriginal Land Council (Albury LALC), and Office of the Registrar. Five individuals and organisations were identified from the responses received from these organisations. They were all contacted in writing on 29 June 2020 and invited to register an interest in the Project. An advertisement was also published in the Border Mail newspaper inviting expressions of interest from Aboriginal Stakeholders.

The following Aboriginal stakeholders registered with Landskape for the Project, hereafter referred to as the Registered Aboriginal Parties (RAPs).

- Mr Mark Saddler from Bundyi Aboriginal Cultural Knowledge.
- Mr Andom Rendell from the Albury LALC.

Survey and Results

The RAPs were asked to provide input regarding the proposed survey methodology. An archaeological field survey was conducted on 15 October 2020 and subsurface testing on 15 and 16 October 2020 by Dr Matt Cupper of Landskape, with the assistance of Mr Saddler and Mr Rendell. During the survey, the RAPs were asked to contribute their knowledge regarding Aboriginal cultural heritage within the Quarry Site and surrounds.

The methodology used for the survey is detailed in Section 7 of Landskape (2020). No artefacts, sites or areas of Aboriginal cultural value were identified within the Quarry Site during the field survey.

Assessment of Impacts

On two occasions, Aboriginal heritage field surveys have not located artefacts, sites, or areas of Aboriginal cultural value within the Quarry disturbance areas. Subsurface investigations in the Stage 4 extraction area also did not identify any evidence of artefacts, sites, or areas of Aboriginal cultural value. Landskape has supported the conclusions of AES (2020a) that the Project would not have any direct impact to Aboriginal cultural heritage. This may be partly attributable to heavy land disturbance from previous quarrying and agricultural activities.

The probability of finding previously unidentified Aboriginal cultural heritage within the Quarry Site is considered low. Furthermore, due to the absence of any culturally sensitive landforms such as lunettes or source-bearing sand dunes, the chances of in situ subsurface cultural deposits being present are highly unlikely.

Ongoing implementation of training and an unexpected find protocol would ensure potential impacts to unknown sites is avoided, where possible.

Representative Comment(s)

A 1.1ha patch of native vegetation to be cleared has not been included in the credit calculations. No clearing for ancillary infrastructure has been included in the assessment.

Recommended Actions:

- *Correctly apply the BAM to determine the vegetation integrity of the 1.1ha patch to be cleared by establishing plots in that patch. This is to include a statement of the homogeneity of this patch, including the trees, and determine vegetation zones consistent with the BAM.*
- *Apply Stages 1 and 2 of the BAM to the vegetation zones in the 1.1ha patch to be cleared (as indicated by Figure 16 of the BDAR), excluding any patches where the vegetation is found to be not native.*
- *Provide a revised BOS credit calculation to include the clearing of the 1.1ha patch.*
- *Include all clearing associated with ancillary activities including road widening, fencing and levees in the BDAR, including any new vegetation zones where that work is anticipated outside of the 1.1ha patch*
- *Provide data consistent with Appendix 10 (Table 25 and 26) including shape files and plot data.*

- *Finalise and submit the BOS calculator related to this proposal.*

Response

In light of the above feedback from BCD, EnviroKey was engaged to undertake a peer review of the Biodiversity Development Assessment Report prepared by Advanced Environmental Systems Pty Ltd and submitted as Part 8 of the Specialist Consultant Studies Compendium. That review determined that the conclusions of this document could not be supported and subsequently EnviroKey was commissioned to prepare a new BDAR (EnviroKey (2021)) for the Project. That document is presented as **Appendix 6**, with the outcomes of the assessment summarised in Section 3.3.3.3.

EnviroKey is confident that matters identified in the above feedback from BCD have been addressed or provided in the updated BDAR.

The general conclusions to the assessment are as follows.

- The Project would impact 0.41ha of native vegetation located within the BDAR footprint.
- An additional 27.43ha of previously cleared land would be used for the development.
- It is unlikely that the Project would have an adverse indirect impact on adjacent areas of vegetation and habitat (from edge effects, noise, or dust). The closest feature is an oxbow wetland and measures are proposed to limit impacts to this wetland feature.
- There are no prescribed biodiversity impacts relevant to the Project.
- A range of proactive and adaptive management measures are proposed to limit potential impacts to biodiversity.
- Serious and Irreversible Impacts (SAII) are not expected from the Project. No flora or fauna species are identified as an SAII entity in the *Guidance to assist a decision-maker to determine a serious and irreversible impact* (DPIE, 2019).

The assessed residual impact to 0.41ha of native vegetation would require the offset of a single ecosystem credit for *PCT 5 River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion* (OEH, 2020b). This credit would most likely be purchased or if none are available at the commencement of operations, a payment would be made to the Biodiversity Conservation Trust consistent with the requirements of the Biodiversity Offset Scheme.

A copy of the BDAR was submitted to BCD on 2 November 2021 (case number 00021174). In email correspondence dated 3 November 2021, BCD commented that assessed credit obligations were consistent with the Biodiversity Assessment Method (2017). No changes to the BDAR have been made since that date.

4.1.3 Crown Lands

Representative Comment(s)

Undertake a status search through a solicitor or surveyor to determine ownership of the waterway - "Lester Lagoon" (the bridge site), and the Department should be advised of these results, to investigate tenure arrangements that may be necessary with the Department in this location

Response

It is understood that "Lester Lagoon" refers to the Black Swan Anabranch in the vicinity of the Quarry Site and the bridge site refers to the land on either side of the bridge as well as the waterway. It is noted that the private bridge crosses from Lot 1 DP 1039973 and Lot 4 DP 113703 over the Black Swan Anabranch to Lot 174 DP 753744

Each of these lots is owned by the landowner who has granted consent for the development application for the Project and has an existing arrangement with the Applicant for the current operations which use the bridge.

Review of historic land title records indicates the following

- Lot 1 DP 741037 and Lot 1 DP 1039973 derived from original Portion 176 comprised in Crown Grant dated 26th June 1861 to James Wyse being Serial 171 Folio 752.
- Lot 174 DP 753744 is comprised in Crown Grant Volume 1234 Folio 241 dated 4th November 1897.

The date of the Crown grant for each portion indicates that the Ad Medium Filum Aquae Rule would apply in accordance with Section 45A of the *Real Property Act 1900* and the boundary of the land would be the centre thread of "Lesters Lagoon" (or the Black Swan Anabranch). Therefore, there is no tenure arrangement necessary with the Department of Crown Lands.

Representative Comment(s)

Apply to close and purchase Crown Road within Lot 231 DP 753744 & Lot 174A DP 753744; especially where excavation has already been undertaken in the past.

Response

An application has been made to close the Crown road within Lot 231 DP 753744 and Lot 174A DP 753744.

Representative Comment(s)

Ensure that the proposal does not impact or encroach on the Murray River.

Response

The Project would not encroach on the Murray River.

The principal risk to the Murray River is from uncontrolled discharge of sediment-laden water from the Quarry Site. The Applicant has designed the Project so that it would be surrounded by flood levees with the height based on a 100 year annual exceedance probability (AEP). These levees would double as components of erosion and sediment control within the Quarry Site as water would not be able to discharge from the Quarry Site without pumping. Pumps are currently used to draw water under licence for irrigation of the property and this process would continue as a measure to remove water captured within the area established by the flood levees.

4.1.4 Environment Protection Authority

4.1.4.1 Noise

Representative Comment(s)

The assessment of annoying characteristics is not considered adequate. The assessment of low frequency noise should include one-third octave or narrowband frequencies down to 10Hz. The assessment in Noise Modelling Assessment shows octave frequencies of 63Hz.

We recommend that the proponent assess the annoying characteristics in accordance with Fact Sheet C of the NPfl (see Attachment B for further information) and apply a correction where applicable to the predicted noise level before comparison with the trigger level, and provide details of any further feasible and reasonable mitigation measures that are necessary to reduce the noise levels.

Response

Low frequency noise (LFN) has the potential to exacerbate noise impacts and relates to noise at frequencies that cannot generally be perceived by the average human ear. Where LFN is a factor in noise generation, the NPfI requires a modifying factor be applied to the outcomes of operational noise assessment presented for A-weighted noise (in dB(A)).

Octave Acoustics assessed LFN in accordance with Fact Sheet C of the NPfI. A screening test of the potential for low frequency noise impact ('C minus A' screening test) was undertaken based on the predictive modelling outcomes. The outcomes of the test indicated that C-weighted noise would be less than 15dB higher than predicted A-weighted noise and therefore low frequency noise is not a matter relevant for assessment. Regardless of this result, Octave Acoustics undertook a detailed evaluation of the 1/3 octave frequencies between 10Hz and 160Hz as described in Fact Sheet C of the NPfI. The results of assessment are presented in **Table 9** and indicate that it is unnecessary to apply a modifying factor correction for LFN to the operational noise assessment results.

Table 9
Low Frequency Noise Assessment Outcomes

	Third Octave Band Centre Frequency, Hz												
	10	**13**	**16**	**20**	**25**	**32**	**40**	**50**	**63**	**80**	**100**	**125**	**160**
LF noise at sensitive receiver	35	42	55	47	46	43	41	41	42	41	41	40	38
LF noise threshold	92	89	86	77	69	61	54	50	50	48	48	46	44
Source: Octave Acoustics (2020) – Table 1													

As a result of the above, no additional management measures are required to limit noise generation to account for annoying noise characteristics. Regardless, the following proposed noise mitigation measures that were discussed in Section 6.5.5 of the EIS would assist in reducing annoying noise levels.

- Frequency modulated reversing alarms would be used on all mobile equipment.
- Regular maintenance of all equipment.

It is also noted that the pit walls and levee banks would act as barriers to noise propagation and reduce the noise (including for annoying characteristics) that may be experienced at private residences.

Representative Comment(s)

The Noise Modelling Assessment provides noise contour maps for Stage 2 of the proposal, however noise contour maps have not been provided for all the proposed stages of work.

We recommend that the proponent provide the noise contour maps for each stage of the work, not just for Stage 2.

Response

Noise contour plots for each stage of operations are provided in **Appendix 10**. Only a single contour plot for Stage 2 of development was provided with the Noise Modelling Assessment (Octave, 2020) as this is the worst-case outcome of assessment. Noise impacts do not vary significantly as the Quarry progresses through the various stages of development with reductions in noise impacts at sensitive receivers expected as stages extract at deeper elevations or move further away from receivers.

Representative Comment(s)

The proposal is on the border of NSW and Victoria. The NPfl is a NSW policy and in the Noise Modelling Assessment it has been applied to the sensitive receivers on the NSW side of the border. The EPA note that there are sensitive receivers to the south of the premises, on the Victorian side of the border, who may be impacted by operations.

We recommend that the proponent considers assessing the potential noise impacts to those sensitive receivers to the south of the premises, on the Victorian side of the border.

Response

The applicable criteria for the assessment of quarry noise in Victoria are prescribed by EPA Victoria publication 1411 *Noise from Industry in Regional Victoria* (NIRV). The closest residences within Victoria to the Quarry Site are 1.5km from active areas. The relevant criteria for noise assessment of land in the vicinity of the Quarry would be:

- Day = 46dB(A)
- Evening = 41dB(A)
- Night = 36dB(A)

The noise modelling undertaken by Octave Acoustics indicates that noise levels 1km from the quarry towards Victoria would be approximately 33dB(A) in a worst case scenario. Noise levels at the nearest sensitive receivers in Victoria would be less than this as the closest is over 1.5km from the Quarry. Therefore, noise levels experienced at private residences in Victoria would satisfy the relevant criteria during all operating periods.

4.1.5 DPIE Water / Natural Resource Access Regulator

4.1.5.1 Water Take

Representative Comment(s)

Provide confirmation of water take occurring from connected water sources, such as the Regulated Murray River Water Source and the Upper Murray Groundwater Source, in accordance with the requirements of the NSW Aquifer Interference Policy (AIP). This requires modelling assessment to determine water take from both the adjacent groundwater source and the connected regulated river water source. Where additional entitlement is required the proponent will need to demonstrate this can be acquired on the water market.

Response

Following peer review of the groundwater modelling undertaken for the EIS by Mr Daniel Barclay of hydrogeologist.com.au, WatSec Environmental (WatSec) were engaged to undertake additional numerical groundwater modelling.

A key objective of this additional modelling was to predict the potential impacts of the Project on the interactions between surface water and groundwater systems, namely changes to the local discharge and recharge regime. WatSec assumed that Layer 1 of the groundwater model (Shepparton Formation of the Upper Murray Groundwater Source) would be the principal zone of surface and groundwater interaction. The groundwater model also assumed a constant water level in the Murray River that was the calculated average of recorded water levels at the Howlong Gauge (Gauge ID409037). It is acknowledged that Murray River levels vary substantially depending on regulation (principally in summer).

WatSec analysed the model Layer 1 water budgets from predictive modelling (refer Figure 27 of WatSec) to identify the annual inflows to, and outflows from, the Murray River to the Shepparton Formation as a result of the Project. Using this data, WatSec then calculated the annual nett loss from the Murray River by subtracting the modelled river inflows from the modelled river outflows. The technical modelling report prepared by WatSec and provided as Appendix A of Water Technology's updated *Groundwater Impact Assessment* (Water Technology, 2022) provides further detail on the modelling approach. Table 7-1 of Water Technology (2022) presents an annual summary of WatSec's predicted inflows (nett loss) from the Murray River to the Shepparton Formation and predicted groundwater inflows to the extraction areas (including evaporative losses).

Figure 10 presents the predicted water access licensing obligations, modelled river inflows from the Shepparton Formation to the Murray River, the modelled river outflows to the Shepparton Formation and the calculated nett loss over the Project-life.

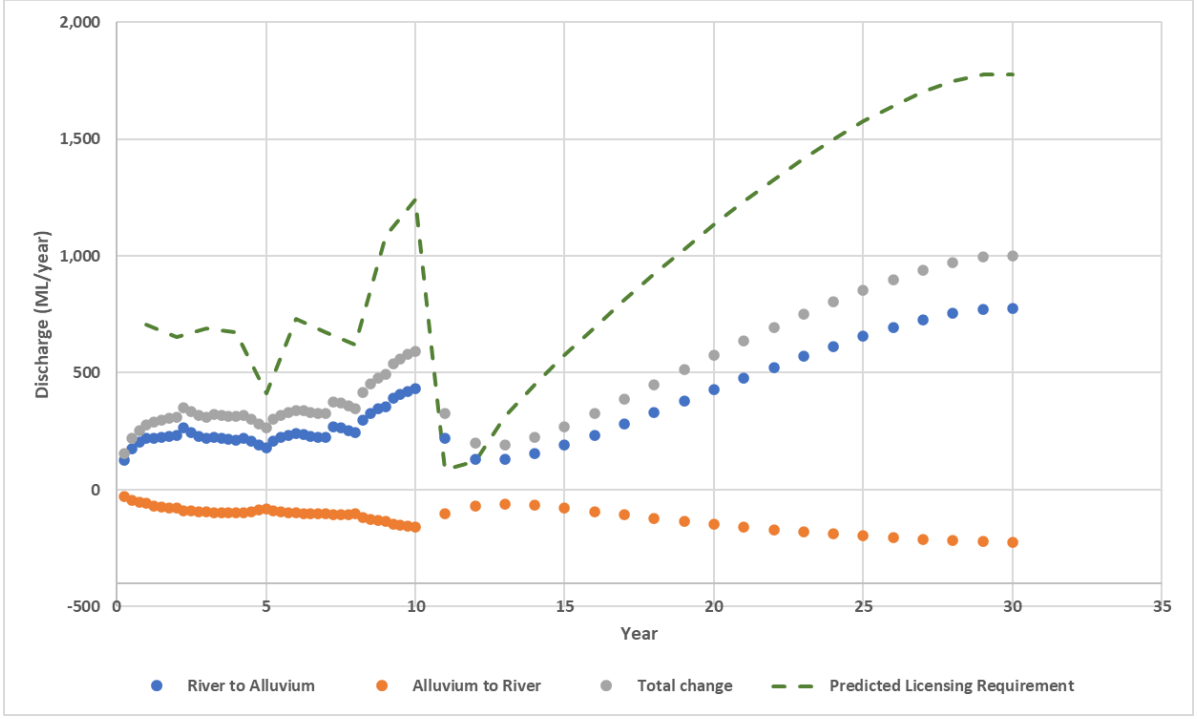


Figure 10
MODELLED SURFACE WATER AND GROUNDWATER EXCHANGE FROM PROJECT

Review of **Figure 10** identifies that on an annual basis, the Project would locally increase flows from the Murray River to the Shepparton Formation whilst concurrently reducing flows in the opposite direction. As extraction operation progress, the discharge from the river increases to a peak of 591 megalitres per year (ML/year) in Year 10 of operations (refer Table 7-1 of Water Technology [2022]). Following Year 10, the annual rate of discharge from the Murray River to the Shepparton Formation is predicted to decrease to 195ML/year before steadily increasing to peak at 1 002ML/year in Year 30. The nett loss clearly correlates with the Project's predicted licensing requirements, although in Years 11 and 13, there is a slight lag apparent between the predicted licensing requirements and nett loss.

Whilst the Upper Murray Groundwater Source is considered hydraulically connected with the regulated Murray River, the management of its groundwater resources is independent of the Murray River due to the lag times in the transmission of impacts from groundwater pumping to the river (DoI, 2019). It is further noted that the long-term annual average extraction limit for the Upper Murray Groundwater Source has been established with regards to the sustainable diversion limits set under the Basin Plan (2012) and acceptable impacts on the connected surface water resources and groundwater resources.

The Applicant holds Water Access Licences (29915 and 29975) with a combined total of 2 000 share components, equating to a minimum licensed volume of 2 000ML/a (1.0ML/share component) from the Upper Murray Groundwater Source. These licenses are sufficient to satisfy the Project's maximum 1 776ML/year obligations under the Aquifer Interference Policy. As the predicted impacts of groundwater inflow to the extraction areas from the Upper Murray Alluvium, including induced flow from the Murray River, are not dissimilar from the acceptable impacts to the surface water system as permitted under the Murray Alluvial Groundwater Sources Order 2020, no additional licenses are considered necessary.

It is proposed that the groundwater model would be reviewed and recalibrated 12 months after commencement of extraction for the Project and then every three years. For the purpose of establishing the maximum predicted licencing requirements that must be held for the Project, it is proposed that, by Year 10 of operations, the maximum predicted licensing requirement would be confirmed with NSW regulatory agencies. Re-calibration of the groundwater model would rely on the collection of additional site-specific data, furthering the Applicant's understanding of the local groundwater system. As the peak licence requirement does not occur until Year 30, this timing is considered appropriate to plan for water use requirements and the licences necessary to account for this.

4.1.5.2 Secondary Take

Representative Comment(s)

Confirm whether water returned to pits that are connected to the water source is proposed to be subsequently extracted. Where this is proposed, entitlement will be required for both the initial dewatering volume and the secondary water take for irrigation or other purpose.

Response

It is noted that there is no current policy that acknowledges (or credits) the return of water to a connected system. That is, water removed under licence and placed in a location connected to the groundwater setting is considered returned to the groundwater setting and further use of that water requires subsequent additional licensing. This is the case even though the physical water remains unchanged.

This policy position is acknowledged (however unfortunate), and a protocol for temporary storage of groundwater inflows that are removed from the extraction area (dewatering) has been developed as described in Section 3.2. Groundwater inflows to the active extraction area will be removed via pumping to provide dry conditions for operations. This water would be pumped to a 20ML to 30ML, clay lined turkeys nest dam which would be used as a balance storage for irrigation. As this turkeys nest dam would not have an external catchment and would not be connected to the groundwater setting, no additional licensing requirements to account for secondary water take would be required.

4.1.5.3 Water Access Licenses

Representative Comment(s)

Holders of all Water Access Licences proposed to account for water take from this project to confirm their commitment to make the necessary entitlement available when required. If inadequate entitlement is available, the proponent will need to demonstrate this can be acquired on the water market.

Response

As noted in Section 4.1.5.1, the Applicant holds sufficient water access licences to account for the maximum predicted groundwater inflows to the extraction areas, including evaporative losses from pit lakes. Protocols would be established in a Water Management Plan to meter all groundwater removed from extraction areas so that groundwater take can be accounted for.

4.1.5.4 Post-closure Water Take

Representative Comment(s)

Consider all options to minimise ongoing water take at the site post closure and hence maximise water use and availability for water users and the environment. Maintaining the final landform above the water table is the recommended outcome.

Response

The post-closure landform currently includes rehabilitated wetlands surrounded by retained and revegetated levees. Periodically, water would be extracted to support irrigation activities and to prevent evaporative concentration of salts in the pit lake water. As presented in Table 14 of WatSec (2022), this would require the Applicant to set aside 139 ML/year of its currently held water licences to cover the on-going anticipated nett evaporative loss from the pit lakes.

Measures that may be available to reduce evaporative water loss would be considered in closure planning and may involve selective planting of wetland plants that cover the water surface. However, at this stage of the development there are limited opportunities to reduce evaporative losses.

4.1.5.5 Peer Review

Ensure that the groundwater model is independently reviewed by a qualified recognised consultant as required by the AIP. This shall include an assessment of the class of model according to the Australian Groundwater Modelling Guidelines (2012) and a statement of fitness for purpose.

Response

As noted in Section 3.3.4, Mr Daniel Barclay of hydrogeologist.com.au was engaged to undertake a third-party peer review of the numerical modelling undertaken for the Project to establish whether the modelling was 'fit for purpose'.

This peer review was tasked with considering the numerical modelling prepared for the EIS against the Australian Groundwater Modelling Guidelines (Barnett et al., 2012), the NSW Aquifer Interference Policy and the Secretary's Environmental Assessment Requirements (SEARs) issued for the Project. Appendix B of the updated *Groundwater Impact Assessment* (Water Technology, 2021a) presents Mr Barclay's peer review of WatSec (2022) that concludes the groundwater model is 'fit for purpose'.

4.1.5.6 Floodplain Risks

Clarify the potential for increased erosion risk to the floodplain and/or the Murray River due to changes to flooding characteristics because of the proposed levees.

Response

Water Technology (2021b) was commissioned to review the flood modelling outcomes for the Project and assess the potential floodplain erosion risks that may result from flood levee construction. The assessment outcomes are presented in Section 3.3.5.2 and the report provided as **Appendix 9**.

Water Technology (2021b) considered risks associated with lateral migration and avulsion that may result from changes in flood velocity and shear stress caused by the presence of levees in the landscape. In summary, it was concluded that the flood levees would act as a mitigation, avoiding risks from flood capture of pit areas and possible avulsions caused by knickpoint progression or development. In addition, the proposed establishment of a 100m vegetated buffer from the Quarry Site to the river and the proposed schedule of riparian and buffer revegetation would reduce possible risks of erosive impact.

The risk associated with lateral migration of the river system was considered in light of possibility that flood flows could cause the direction of the Murray River to change in favour of the Black Swan Anabranch. However, the proposed levees and revegetation schedule would also limit possible lateral migration of the river system by stabilising the bank in the vicinity of the Quarry.

It is considered that during the operational life of the Quarry, the presence of the levees would minimise flood-related risks by ensuring that flood flows do not enter operational areas. Similarly, the presence of the levees would limit the risk of erosive impacts across the floodplain. It is proposed that the levees would be retained in the final landform to support wetland development. However, in the event that irrigation activities cease, a contingency for removal and establishment of a safe and stable landform would be required. This contingency would be considered in closure planning and be presented in a Closure Strategy that would be prepared at least two years prior to closure.

Clarify the risk to floodplain and pit stability due to floodplain flows if the levees are removed to address water quality issues in the pits post closure.

Response

As noted above, it is proposed that the levees would be retained in the final landform. This would protect wetland areas from flood flows. Continued use of water for irrigation is anticipated and a schedule of rotated water sourcing would be used to refresh water within the wetlands and reduce the potential salt build up through evaporation. In this scenario, evaporation would remove water but not salts in the water, therefore leading to an increase in salt concentration over time. Where water it taken for irrigation, the salts would also be taken from the system. Groundwater inflows would refresh the water within the wetlands. The salinity of the wetlands was modelled by Water Technology (2022) to increase by 10mg/L/y from an assumed starting salinity of 450mg/L. Water Technology (2022) note that this estimate is indicative only as the actual long term salinity regime within the wetlands would depend on a range of factors including climate, aquifer parameters, actual excavated pit dimensions and long-term pit management.

In the event that water is no longer used for irrigation, there would be no mechanism for refreshing water within the wetlands. In this scenario, the final landform concept may need to be revisited to remove the flood levees so that the wetlands may be refreshed through occasional flood flow as currently occurs in natural wetlands along the length of the Murray River. Water Technology (2021b) reviewed pit stability and erosion risks. Risks associated with lateral migration of the Murray River and avulsion caused by pit capture were identified. Water Technology (2021b) noted that should the levees be removed engineering design of the final landform would assist to mitigate erosion risks post-closure and may include plans to:

- maintain water levels as high as possible in the wetlands;

- apply rock armouring and flood flow entry and exit points; and
- maintain and potentially expand vegetated buffers.

It is currently proposed to maintain natural water levels and provide revegetated riparian buffers as part of the currently proposed landform. A design that incorporates rock armouring and flood flow entry and exit points would be required in the event the levees must be removed at closure. A concept closure plan to account for removal of flood levees would be presented in a Closure Strategy that would be prepared two years prior to closure and would be informed by an understanding of ongoing irrigation requirements. This would incorporate contingency planning in the event that irrigation ceases.

4.1.5.7 Flood Levee Alignment

Realign the levee at the location of the proposed 100m buffer to adjacent to the Stage 1 excavation area.

Response

The flood levee has been re-aligned to follow the extraction boundary in the southeastern corner of the Stage 1 extraction area (see **Figure 2**). It is proposed that the levee be constructed to the previous alignment while land reclamation occurs, after which time it would be removed and relocated. Both the temporary and permanent alignment are presented in **Figure 2**. This would ensure that operations in the Stage 1 extraction area are protected by the levee while these works occur, but that the final alignment reflects the final boundary of disturbance and the proposed wetland. The flood levee has also been re-aligned on the northern side of the Stage 1 extraction area to incorporate the overburden emplacement area.

4.1.5.8 Dewatering Water Storage

Representative Comment(s)

Demonstrate alternative dewatering water storage and or disposal in the event (however unlikely) that the current farm irrigation off-take is no longer tenable.

Response

The Applicant has projected demand for irrigation is 22ML every three days or approximately 7.3ML per day on average. This may be compared to the calibrated inflow volume prediction of 1.5ML per day.

Irrigation demand is based on 22ML used in a 24-hour period across four large and four small irrigation pivots initiated every three days on average. There are natural variations in irrigation demand with a higher demand in summer and less in winter and in response to climate variations such as rainfall or extended hot and dry periods. On the basis of predicted use of four large and four small irrigation pivots, the annual irrigation demand is in the order of 2 684ML per year, a much greater volume than the peak predicted inflow volumes (1 776 ML per day). The Applicant has reviewed the possible locations for future irrigated agriculture on the broader property and land that is owned by the Applicant on the northern side of the Riverina Highway. **Figure 11** presents an indication of locations on the broader property managed by the Applicant

that may be irrigated if needed and indicates there is substantial land available. It is also noted that water may also be irrigated on land not subject to cropping use, albeit in lower volumes to manage runoff potential. The Applicant has also been approached by neighbouring landowners who have indicated their interest in water supply arrangements should it be feasible. It is therefore considered highly unlikely that dewatering water storage and use in irrigation would become untenable.

Regardless, alternative strategies for management of groundwater inflows have been considered with the following options available to the Applicant.

1. Pumping water to the existing or completed extraction areas. Water Technology (2022) has estimated a period of six to eight years for groundwater level equilibration based on maximum extraction depth. The regulation regime for the Murray River may influence this process, however water from active areas may be pumped to completed areas, as needed. This process would speed up the equilibration process (therefore reducing groundwater draw to completed areas) but would have limited long term applicability once the completed areas fill with water.

   Water may need to be discharged to the natural environment. This would involve temporary storage to allow clays and other fine materials to drop out of suspension, possible application of a flocculant to reduce sediment levels and water quality testing prior to any discharge to ensure that water quality satisfies the requirements of the NSW Environment Protection Authority (EPA) as specified in an Environment Protection Licence.

   It is acknowledged that this would represent a change to the Project and introduce a potential impact not previously considered. Should this be required, an application to modify the development consent would be required and would involve detailed assessment of water pollution risks and geomorphic risks associated with the proposed method of discharge.

   Opportunities for discharge may involve direct pumping of water to the Murray River or the use of polishing basins to slow down discharge and encourage sediment to drop out of suspension. These are standard methods with their applicability dependent on the receiving system.

   A water pollution impact assessment would be prepared in consultation with the EPA and DPIE and would involve the following.

   – Review of all practical and reasonable measures to avoid or minimise water pollution and protect human health and the environment from harm.
   – An estimate the frequency and volume of the proposed discharges.
   – Characterisation of the expected quality of each discharge in terms of the typical and maximum concentrations of all pollutants likely to be present at non-trivial levels (including coagulants/flocculants).
   – Assessment of the potential impact of the proposed discharges on the environmental values of the receiving waterway, including for typical through to worst-case scenarios, with reference to relevant guideline values consistent with the national Water Quality Guidelines (ANZG 2018).

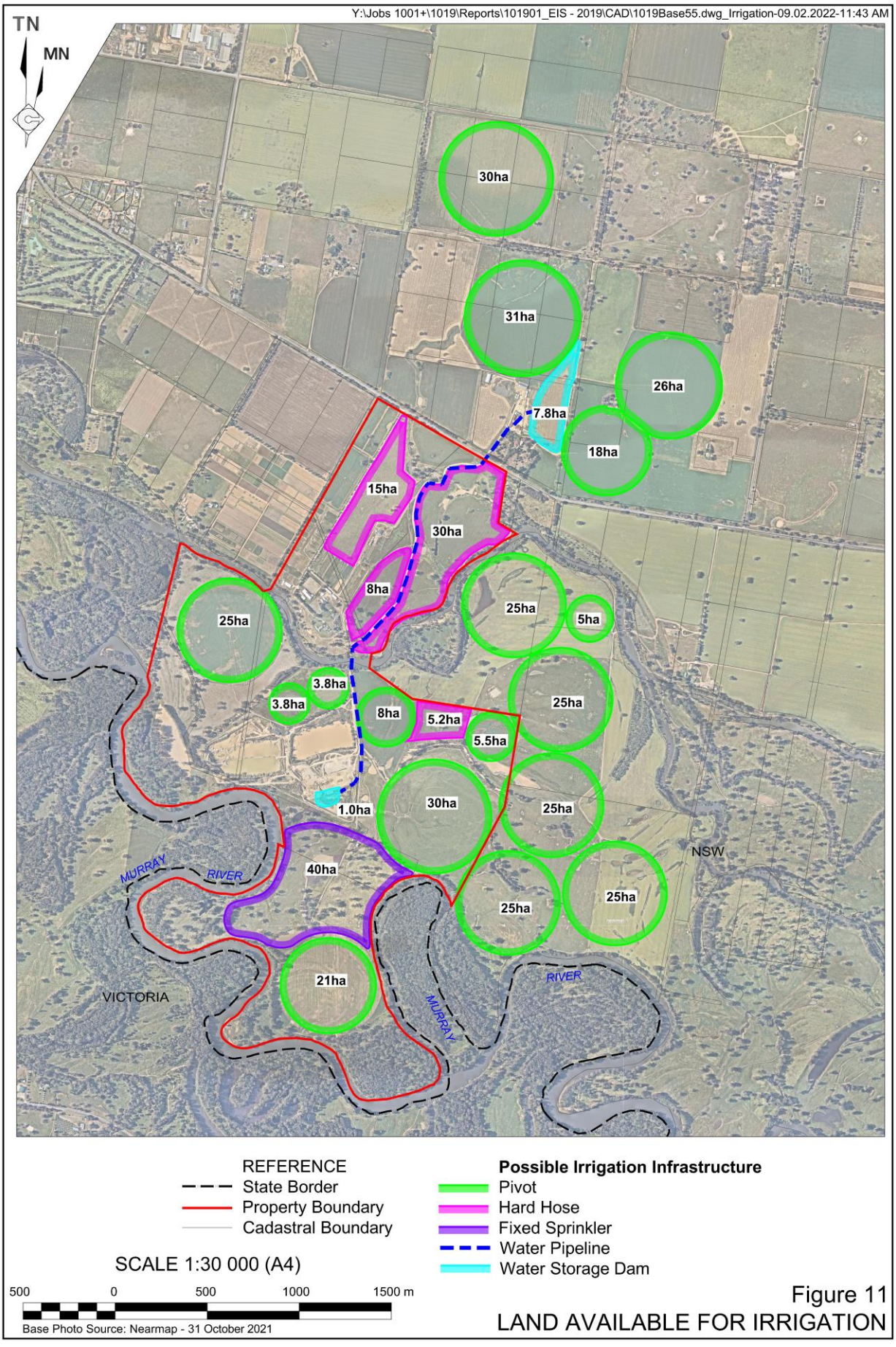


Figure 11
LAND AVAILABLE FOR IRRIGATION

– Where relevant, measures to mitigate impacts such as enlarged basins or transfer to other onsite storages would be identified.

It is noted that Section 6.4.2 and Table 6.7 of the EIS presented a summary of the outcomes of surface water quality monitoring within the Quarry Site and at one location in the Murray River. The results indicate relatively high turbidity in the Quarry Site compared to the river and therefore the need to allow for sediment to settle out of suspension in settling basins or application of a flocculant.

The Applicant has large areas available for the development of settling dams to reduce sediment loads in water for discharge and therefore it is not considered that water management for discharge would constrain the development.

As noted above, it is considered high likely that either of these options would be required given the benefits of reuse of dewatered groundwater for irrigated agriculture.

4.2 PUBLIC SUBMISSIONS

4.2.1 Introduction

The following subsections present responses to matters raised in community and organisation submissions. A total of 42 submissions were received from individuals and organisations. Of the public and organisation submissions:

- 25 submissions objected to the Project.
- 8 submissions supported the Project.
- 9 submissions commented on the Project.

For each matter raised, a representative comment is presented that best describes the matter requiring a response. Other submissions may have raised the same matter but are not presented here. All submissions have been considered in formulating a response. **Appendix 1** presents a submissions summary that lists each submission, the topics raised and where in the document the matter has been addressed. The matters are presented in alphabetical order for ease of review.

4.2.2 Biodiversity

Representative Comment(s)

There will be major changes within the environmental management zone for wetlands and for landscape and riparian. If we continue to abuse and take away these areas soon, we will have a negative impact on our local environment, and it will be too late to turn back time. Tourist come to the area because it is a wonderful area to visit and lots of birdlife.

Name Withheld – SE-126566

Response

Detailed assessments of potential impacts to biodiversity values have been undertaken including several field surveys of the area at different periods. It is a requirement for all State Significant Development in NSW to undertake a Biodiversity Development Assessment Report

(BDAR) which is a detailed investigation that has prescribed matters for assessment. The assessments undertaken for the Project have indicated that only minor areas (0.41ha) of native vegetation would be removed for the Project. In addition to this, the Applicant has committed to a substantial program of revegetation of the constructed flood levees, riparian areas and the areas surrounding the operation and plans to create artificial wetlands in extraction areas once works are completed. These actions would be described in a Biodiversity and Rehabilitation Management Plan and would include performance and completion criteria that would be subject to annual review and periodic independent auditing.

The Applicant considers that the Quarry operations would remain isolated from the natural features of the locality and that the program of environmental management would only act to attract wildlife and potentially tourists to the area.

Representative Comment(s)

Mining sand and gravel will likely increase the threat to already threatened ecosystems that are currently surviving, or trying to survive, in our local waterways including the mighty Murray River.

Olivia Noto – SE-125948

Vulnerable species include the Superb Parrot, which is known to breed in this area, and Sloane's Froglet – this is one of the last habitiats (sic) *of this disappearing amphibian species.*

Name Withheld – SE-126616

Sloane's Froglet has been uplisted from Vulnerable to Endangered under the Commonwealth Environment Protection and Biodiversity Conservation Act (EPBC Act) on 4 July 2019. Correspondence from the relevant Commonwealth department included in the exhibited project documents suggests the development does not require referral, but it is dated 4 June 2018.

Name Withheld – SE-126618

Response

Only a single threatened fauna species was identified within or near the proposed Quarry Site. EnviroKey (2021) identified numerous Brown Treecreeper along the Black Swan Anabranch indicating one but likely more family groups along this watercourse.

It is acknowledged that some species have the potential to occur in the area and measures would be put in place to ensure impacts are limited to approved areas. Principally, this would include bounding the site by flood levees outside of which vegetation removal would not be required, except for road access arrangements. All environmental management measures would be described in comprehensive environmental management plans that would need to be approved by DPIE prior to the commencement of operations. As described above, the Applicant has committed to a substantial program of revegetation of the constructed flood levees, riparian areas and the areas surrounding the operation and plans to create artificial wetlands in extraction areas once works are completed.

A 2.7m high flood levee would be constructed to provide protection up to the 1% average exceedance probability flood level (one in one-hundred-year event). The levees would also stop potentially sediment-laden water from leaving the active areas, minimising potential water quality issues associated with runoff from the development and hence protecting the ecosystems in the local waterways and the Murray River.

The potential presence of the White-bellied Sea Eagle and the Sloane's Froglet were identified from background research of local records and the predicted habitat presence. Despite targeted field survey for these species and especially the Sloane's Froglet, no individuals of these species were identified in the vicinity of the Quarry Site and none are predicted to occur in the previously disturbed operating areas. There were no signs of existing or former nests that may indicate eagle habitat. It is therefore not considered necessary to revisit the correspondence with the Commonwealth Department of Agriculture, Water and the Environment regarding impacts on species listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

4.2.3 Economic

Representative Comment(s)

This project is going to provide employment and it will also provide a much needed boost to the local economy.

Katrina Dutton – SE-125834

I strongly support the expansion of this pre-existing quarry. I believe it will provide great employment opportunities for some local residents who may be unemployed or are looking at a different career.

Name Withheld – SE-125937

Response

When operating, the Applicant currently employs eight people at the Quarry. The increase in extraction up to 330 000tpa is anticipated to increase the maximum number of employees to 10 full time employees. The Applicant will not employ road vehicle operators directly with all activities to be contracted or supplied by clients. The indirect employment of drivers and other maintenance and servicing contractors is considered likely to support an additional 25 full-time equivalent positions.

It is anticipated that all operational personnel would reside in Howlong, Corowa or Albury. Increased employment would have flow-on effects through the payment of wages and the subsequent purchase of housing or payment of rent, groceries and spending of disposable income in the Federation LGA.

Representative Comment(s)

I support the project as it will make concrete cheaper in the area. The price of concrete supply is very important to industry in the town of Albury as it allows buildings whether they be industrial, commercial or housing to be built at competitive rates.

Paul Gallagher – SE-126617

Response

The Applicant considers that the presence of a well-managed and environmentally responsible operation that is operating at a level that is greater than the current small-scale operations would only benefit the supply and cost of concrete in the region. It is anticipated that the Quarry would provide these benefits for many years to come.

Representative Comment(s)

We feel that the promises of jobs and other economic benefits to Howlong is a smoke and mirrors act. There will be minimal if any economic benefit to Howlong itself.

Name Withheld – SE-126566

For local people and the environment, the project brings a great deal of risk with virtually no benefit – just 2 additional onsite full-time jobs on top of the 8 already employed at the quarry site.

Name Withheld – SE-126616

If benefits are achieved they are unlikely to be achieved within Howlong to offset the impact of the additional truck movements.

Name Withheld – SE-126628

Response

It is appreciated that the benefits of local operations that support the construction industry, road maintenance and infrastructure development may not be easy to directly perceive for local community members. The benefits of these operations come through indirect actions. For example, a truck driver working at the Quarry may stop briefly in Howlong to purchase lunch or a person working contract jobs or with uncertain employment may be able to secure a full-time position that permits them to save and apply for a home loan and settle permanently in the local area. There would also be direct benefits such as the purchase of consumables.

As noted in Section 4.1.1 in response to the comments from Council, traffic generation for the Quarry would contribute only 2.6% of total traffic on the Riverina Highway to the west of the Quarry and a peak of no more 5 laden loads per hour (10 movements including the return). It is therefore considered that traffic level changes would be difficult to notice and that the economic benefits would outweigh residual minor traffic impacts.

4.2.4 Environmental Management

Representative Comment(s)

Given the obvious absence of any consistent regulatory and legislative enforcement presence in the township it is difficult to believe that any operational standards and conditions would be consistently and regularly monitored and compliance enforced.

Helen Jones – SE-126556

Response

It is acknowledged that community members may not regularly see regulators that manage extractive industry operations. However, it should be noted that the Project would be regulated through:

- the Compliance section of the Department of Planning, Industry and Environment;
- the Environment Protection Authority in accordance with the requirements of the Quarry Environment Protection Licence;

- the Natural Resource Access Regulator in accordance with the water access licences and works approvals granted for the operation;
- the Resource Regulator that also incorporates the Mines Safety Department.

Further to this, the Applicant would be required to prepare annual reporting on the activities undertaken and proposed, the environmental management outcomes, compliance management and complaints that have been received. All State Significant Development is required to undertake regular independently commissioned site audits with reports to be submitted to the DPIE Compliance section and published on the Company website.

It is therefore considered that the operation would be heavily regulated and the Applicant accepts this approach to its activities.

Representative Comment(s)

For communication: over the course of the development, the developer should make relevant documents and annual reports of community interest publicly available, for public comment.

Name Withheld – SE-126618

Response

It is a standard condition of consent for State Significant Developments that all documentation prepared for the operation must be made publicly available from the Company website. This would include any monitoring records required to be kept by the EPA.

4.2.5 Flooding

Representative Comment(s)

The levee proposed to protect the project is likely to cause any natural flooding to be redirected due to the significant size of the extended boundary of the site. Who is going to be the recipient of this water and given the recent natural disasters caused by water all over the world is a 1 in 100 year event the most appropriate level to be using as a basis for prescribing the protective measures?

Narelle and Graham Ashford – SE-126555

Can we have assurance that flood and pollution risks from the development – such as flooding upstream and downstream due to levees, and increased losses from groundwater – will not impact the town, including under future climate change expectations.

Name Withheld – SE-126618

Response

As described in response to the submission of Council, the assessment of flooding impacts resulting from the construction of the proposed flood levees is not expected to substantially alter flooding impacts within or beyond the floodplain. The 1% average exceedance probability flood levels (one in one hundred years) is a relatively standard planning metric that ensures a reasonable level of caution is applied, without being overly restrictive on development. If a greater planning level was applied it would substantially restrict any development including residential and commercial development in floodplain areas.

The level of flood planning and the proposed flood levees are considered appropriate for the development. The assessment of flood risks undertaken by Water Technology applied modelling assessment techniques to predict changes to the environment and the change to flood patterns. It is considered that an acceptable level of understanding of flood risks has been presented in order to support approval of the Project.

4.2.6 Groundwater

Representative Comment(s)

I also have a town bore for my vegetables and garden and would be concerned if this could be contaminated in some way. The gravel pit is close to the Murray River and I am concerned that this type of development may cause turbidity and other interference in water quality.

William Douglas Pressnell – SE-126527

Response

It is not anticipated that the Quarry would alter the groundwater setting to the extent that home-grown vegetable gardening would be adversely impacted. Given the location of the Quarry Site between the Murray River and the Black Swan Anabranch, the draw on groundwater under licence in the vicinity of the Project would be unlikely to substantially extend past these watercourse boundaries. The Project would not be handling or storing chemicals or hydrocarbons in volumes that present a significant risk of contamination of the groundwater setting. The presence of sediment laden water in extraction areas is consistent with the natural environment and would not cause contamination or turbidity in the Murray River. The flood levees that are proposed for the Project would limit the uncontrolled escape of water from the Quarry to the natural environment. Water captured within the Quarry would be used for irrigation of crops within the broader property, however this is not expected to impact land capability or lead to sediment-laden runoff in substantial volumes.

Representative Comment(s)

Loss of significant volumes of water over the life of the project, due to mine operation, evaporation, and groundwater interception. Climate change and water scarcity have already triggered 'water wars' in the Murray-Darling catchment, between upstream and downstream communities and conflicting commercial and environmental values. In 5-10 years' time (or sooner), this project is likely to become a liability in terms of environmental degradation and water use…

Interception of shallow and deep aquifers in the course of excavation and pit operation. The operation is upstream of Howlong, which depends on groundwater for irrigation and community use, especially during drought.

Name Withheld – SE-126616

We are particularly concerned that pumping high flows of water in the proposed quarry extensions will adversely affect water availability under Howlong and local farms and could cause mineral contamination, both under Howlong and in the river and anabranches if water is discharged from the quarry operations.

Roger Hall – SE-126547

Howlong has extensive bore water, which is widely used for multiple purposes. It is important any project does not interfere with the high flows available to the township.

Name Withheld – SE-126512

Response

The Applicant has demonstrated that all water required for the development and for irrigation activities on the broader property would be sourced under licence. Therefore, the Applicant is legally entitled to use this water. These processes would not limit the access to water for any landholder or for use in Howlong.

Further to this, the Applicant is allowing for a second beneficial use of the water required for the development by first using it to wash raw construction materials and then applying this water to land for agricultural activities. This is a positive outcome in terms of the efficient use of water resources.

As noted previously, it is not intended to discharge water from the Quarry Site. Uncontrolled discharge would be limited by the proposed flood levees.

4.2.7 Operating Hours

Representative Comment(s)

The report makes the presumption that it is acceptable that heavy vehicles are able to commence at 6.30am because that is how they operate now. This is not acceptable and the site should not be receiving heavy vehicles until 7.00am at the earliest.

Leigh Ashford – SE-126602

The proposed spread of operating hours for truck movements from 7am to 10pm is too expansive and provides maximum flexibility to the operator and nothing for the residents of Howlong.

Name Withheld – SE-126628

*Can we have assurance that noise from the quarry will not be heard from the town and that **all** truck movements begin no earlier than 7am and cease no later than 8 pm?*

Name Withheld – SE-126618

Response

The proposed operating hours are considered appropriate given the isolated location of the Quarry Site, direct access to the Riverina Highway, low total contribution to traffic and predictions of road noise generation.

While the Project may be permitted to operate over a given period, it does not follow that operations would occur at the limits set in the development consent over all hours and all days and that this would mean constant truck activity. The limits represent peak activities and not average traffic levels. For example, a peak of 10 movements for heavy vehicles in an hour can only be maintained for eight hours before the daily maximum of 80 movements is reached. The proposed operating hours cover 15 hours and therefore average traffic levels are likely to be much lower.

The Quarry is located on a rural property that is separated from neighbours and has direct access to a State highway (the Riverina Highway). Further, the Riverina Highway is designed and intended to accommodate freight traffic in the region, including construction materials. Assessment of road noise generation predicted that the Project would result in a negligible (1dB(A) during daytime operations) increase in road noise. In practical terms, a 1dB(A) increase or change in noise level is an imperceptible change. The noise of a single truck passing would remain consistent with the noise generated by heavy vehicles that use the road now.

From the perspective of the Applicant and its customers, the morning hours permit deliveries to concrete batching facilities to re-stock raw materials used in early morning concrete production. Later hours provide flexibility to supply evening and night road maintenance works and also to ensure that storage at concrete batching facilities is adequate to commence efficiently in the morning.

4.2.8 Property Values

Representative Comment(s)

The extension of the quarry could also have a negative effect on house prices in the area as people will not want to live in an area that has large truck going through the centre of the township. This will cause a downturn in rates at some stage.

Name Withheld – SE-126566

Response

It is acknowledged that the stigma associated with quarrying operations is often perceived as affecting the attractiveness of an area or a specific property and this could be reflected in property values. The experience of this matter is that there is no evidence of a direct correlation as there are many factors that influence why a person or family may choose to purchase a particular property or live in an area.

Contrary to the expectation expressed in the submission, it is expected that the operation would remain generally isolated from other properties and the centre of Howlong. The change in traffic levels would result in an additional 2.6% of vehicles on the road to the west of the Quarry and an 18.3% contribution to heavy vehicle traffic during peak operations. It is important to note that these traffic levels would not be experienced every day or on average but only during time of peak operations and are presented so the worst case outcomes can be considered and assessed.

4.2.9 Proximity to Market

Representative Comment(s)

Given the competitive nature of our Industry it is essential that our partners can access quality raw materials at a reasonable price point. This then enables us to be competitive within our market and therefore continue employment and further growth within our business. Further to this I would note that our customer base can also require reporting on environmental impacts. With a resource closer to our market and the reduction in transport requirements this can only result in a positive for all involved.

Fletcher Plumbing & Co Pty Ltd – SE-126636

The distance to market for ready mix concrete raw materials, such as sand and gravel, is a significant cost driver and having resources close to market provides a benefit to the local infrastructure builds. Sand and gravel resources in this area are limited and this key resource will secure local aggregate and sand supply for many years to come…

We fully support the application for expansion of the Howlong Sand and Gravel Quarry to 300,000 tonnes per annum. Expansion of the Quarry will ensure continued and reliable supply of construction materials for our projects and in turn, will continue to allow up to employ numerous resources within the building and construction industry.

Barker Group NSW Pty Ltd – SE-126608

As a current customer of the quarry, access to the local aggregate and sand enables Hanson to manufacture and supply premixed concrete into the local communities at cost competitive rates.

Hanson Construction Materials Pty Ltd – SE-126605

Response

A feature of the Project is its proximity to markets in regional NSW and Victoria as well as into metropolitan Melbourne, if required. This includes supply to areas currently the focus of infrastructure development such as the development of Snowy 2.0. Where resource access is scarce, a substantial distance must be travelled to source materials of suitable structure and quality. The cost of transport can become a significant component of the total cost of construction materials and disadvantages business in areas that cannot directly access resources. The Quarry has been operating for many years under its existing approval and the demand from the construction industry has prompted the proposed expansion and increased operating capacity. It is considered that the demand and location of the operation provides strategic justification for the Project at the scale and intensity proposed.

The indirect employment that the Project would contribute to is also noted from the above submissions as well as the general indirect benefit of an operation that generate employment and the use of consumable products and other services.

4.2.10 Rehabilitation

Representative Comment(s)

Requirements for rehabilitating and managing the relatively deep remnant pits as both wetland settlement ponds and irrigation dams are contradictory.

Name Withheld – SE-126616

*…there are issues around the excessive depth of the pits for wetlands; managing the pits for **both** irrigation and environmental purposes; and the long-term commitment for managing wetlands **after** the quarry has finished (including the long-term management of the levees).*

Name Withheld – SE-126618

Response

The use of water for irrigation would be ongoing during and after completion of operations but only as needed for the property. The areas under irrigation may be expanded or decreased, as needed. It is not the intention that extraction areas would be emptied for irrigation purposes but would be relied upon in rotation. The estimated irrigation demand of 22ML of water every three days gives an indication of how much water would be required and the frequency of use.

It is not agreed that drawing water from these areas for irrigation would limit wetland development and sustainability. In fact, the rotational nature of water sourcing would ensure that each of the wetland areas is continually refreshed and naturally occurring salts would not accumulate.

Long-term management of the wetlands would occur beside irrigation and agricultural use of the property. It is proposed that rehabilitation would be considered complete once wetlands are self-sustaining. This may prompt removal of irrigation pumps if it is beneficial to source water from a production bore placed on the property. This would be considered at closure. Further to this it is currently proposed that flood levees would be removed at closure, however this would also be considered in detail in planning for site closure.

4.2.11 Site Access

Representative Comment(s)

There is potential for sand from truck tyres to be spread onto the Highway surface creating additional hazards. What is being done to ensure sand and gravel will not be deposited from the truck tyres on to the road surface.

John Skinner - SE-126607

Response

The Quarry Access Road is approximately 1.8km long and would be sealed for 30m before meeting the seal on the Riverina Highway. This distance would ensure that the majority of materials would be knocked from vehicle wheels before they enter the public road network. Additional measures would have only marginal additional benefit.

Representative Comment(s)

In view of the increasing traffic that will enter and exit the Riverina Highway I feel the lack of turning lanes onto a busy road will become a very dangerous traffic hazard.

Stanley Smith- SE-126528

Response

The proposed upgrade to the intersection of the Quarry Access Road and the Riverina Highway is presented in **Appendix 3**. The intersection would be constructed with a sealed Basic Right Turn (BAR) and Basic Left Turn (BAL) treatment in accordance with the Austroads Guide to Road Design. These design requirements are based on consideration of vehicle movements at intersections and the existing and predicted traffic levels on the relevant roads. The intersection design is considered appropriate for this location and the commitment has been agreed in consultation with TfNSW.

4.2.12 Social Impacts

Representative Comment(s)

We simply advocate consideration and action on the prevention of the huge social impact such a development 's traffic would have on our town. If up to 10 b.doubles were to drive through Hawkins St per per (sic) *hour, it is hard to imagine the impact of the constant stopping and*

starting that would ensue, due to pedestrian traffic and the only entry to the supermarket being only a few metres from the turn to either left to the river crossing, or the right to continue on the Riverina Highway. It would be horrendous.

Margaret O'Donnell – SE-126467

As a frequent pedestrian to and from the shops, school and preschool, this would have a negative impact on my personal and my children's enjoyment of our walks, as well as a possible impact of the safety of the roads.

Penelope Pattinson – SE-125905

We shop in the main street of Howlong. We have excellent privately owned small businesses that cater for everybody needs…

We are greatly concerned with the extra number of heavy trucks travelling through our main street.

Debbie and Robert Travers – SE-126290

The balance of industry, retirees, young families, and a variety of other demographics is what makes Howlong unique and a increasingly desirable place to live.

I acknowledge that the quarry has its merits for employment and development but at this level of expansion, in current circumstances, Howlong would undoubtedly and sadly become an industrial thoroughfare.

Name Withheld – SE-126539

The increased, intrusive and repetitive noise would negatively impact on businesses who have seating outside, facing Hawkins St i.e. The Bakery and ½ Acre Café. The ambiance shattered, whilst constant heavy trucks rumble through. Impacting abilities to hear, hold a conversation or maintain one.

Name Withheld – SE-126557

Impact on community safety, amenity and quality of life: One heavy vehicle movement every five minutes of large earthmoving trucks, including B-doubles, along the Riverine Highway will destroy the peaceful amenity of the town for six and a half days (and nights) a week for 30 years.

Name Withheld – SE-126616

Response

The concerns felt by some members of the community is evident in the submissions received. The potential amenity impacts of the Project have been the subject of comprehensive technical assessments that predict that the Project would operate within acceptable criteria established in NSW guidelines and legislation. Assessment of physical amenity issues such as traffic levels and safety, visibility, noise and dust generation all indicate only minor changes to the local setting. These all influence outcomes relating to the proximity of the operations to Howlong. The Quarry is relatively isolated and separated from residential areas and the centre of Howlong. The potential for residual social impacts has been identified as a result of changes to local amenity which may influence the existing way of life for some stakeholders.

It is acknowledged that the existing number of heavy vehicles passing through Howlong would increase. This has been perceived as a significant change for some members of the community. It should be reiterated that traffic generation for the Quarry would contribute only 2.6% of total traffic on the Riverina Highway to the west of the Quarry and a peak of no more 5 laden loads per hour (10 movements including the return) which would mean a truck passing every six minutes on average or every 12 minutes in one direction.

The traffic levels assessed in the EIS and Road Transport Assessment (TTPP, 2020a) represent anticipated peak activities and not average traffic levels. It is not possible for the operation to maintain the peak levels over all operating days and hours. Peak levels are presented to inform the assessment of possible outcomes and to ensure these levels are acknowledged in conditions of consent. Average daily and hourly levels would be much lower. For example, a peak of 10 movements in an hour can only be maintained for eight hours before the daily maximum of 80 movements is reached. The proposed operating hours cover 15 hours and therefore average traffic levels are likely to be much lower.

The Riverina Highway is also a designated State Road designed and maintained to carry freight including construction materials in this location. The town of Howlong has grown around this road and now the traffic that enabled growth and vitality in the past is the subject of concern. The Applicant supports and would use a bypass of the centre of Howlong should it be constructed by the NSW Government.

It should also be acknowledged that the Quarry traffic would be managed under a Driver's Code of Conduct and Traffic Management Plan. Vehicle movements would also need to be monitored each hour to ensure that peak limits are not exceeded. The conditions of development consent would specify the limits and guide ongoing regulation and independent environmental auditing of the operation. For drivers that are transporting material for the Quarry, they risk losing their jobs or contracts with the company if they do not satisfy requirements.

The potential impacts presented in many submissions overestimate the potential outcomes based on what is expected by the community from a proposal that involves heavy vehicle transport activities. It is not expected that the outcomes presented in these submissions would eventuate but that it is more likely that the impacts experienced would be consistent with that described in the various technical assessments for the Project.

Representative Comment(s)

On 29 April 2020 my wife and I received a letter from NSW Planning, Industry and Environment concerning the proposed tenfold expansion of the quarry at Howlong. In spite of the fact that we live in Howlong and are involved in the community, the letter was the first official information that we had received about the project. This fact calls into question the extent of community consultation about the project, the veracity of the findings from the apparent consultation with residents, and the degree to which the findings can be generalised as a legitimate view of community concerns relating to the proposed development.

Name Withheld – SE-126530

Response

The consultation for the Project was described in Section 3 of the EIS and describes the consultation activities undertaken that included the following.

- Leaflet distribution and newspaper advertisement.

- Community Consultation Session (March 2018).
- Social Media posting.
- Community Group meetings.
- Engagement with Aboriginal stakeholders.
- Government agency consultation.

The outcomes of consultation were used to inform the Social Impact Assessment that was prepared by Dr Jonathon Howard which was presented as Part 11 of the *Specialist Consultant Studies Compendium*. While the Applicant considers that adequate consultation has occurred, it may not be possible to reach all interested community members.

The Applicant has committed to the following measures to keep interested community members informed of the progress of the development and to engage with the community on matters that are important to them.

- Preparation and implementation of a Community and Stakeholder Engagement Plan.
- Supporting the formation of a Community Consultative Committee and hosting meetings twice a year.
- Establishing a complaints register and protocols for recording, investigating and responding to complaints.

4.2.13 Sustainable Development

Representative Comment(s)

Sand and gravel, like coal and other resources from the earth, are finite and not sustainable for extraction. Due to ever-increasing construction demands, it cannot be replaced faster than it is extracted, and sand that is naturally sourced (e.g. from deserts) is not usable for construction.

It would be much for sustainable, and more profitable long-term, for Howlong to invest in renewable energy like solar and wind power. Such initiatives would heed the advice from experts and help Australia to meet our carbon emissions reduction targets. (See Reference 2).

Olivia Noto - SE-125948

Response

This comment overlooks the demand experienced in regional markets and metropolitan Melbourne for concrete which is used for residential and commercial buildings, the raw materials needed for road construction and maintenance and the concrete required for infrastructure developments such as Snowy 2.0 and the Westgate Tunnel.

Reducing access to sand resources would have a significantly adverse effect on life in Australia. In reality, without strategically located sand resources such as that at Howlong it would be likely that there would be a further increase to the cost of development as product users would need to source raw materials from more distant sources.

The construction industry has long acknowledged its role in encouraging technological development in concrete production to be more sustainable and cognisant of greenhouse gas emissions. For example, ECOPact is a low carbon concrete that has been developed by Holcim that reduces embodied carbon by 30%-60%. Further to this, the industry has been investing in a shift to electrical vehicles which will reduce emissions from vehicles but also reduce engine noise. These are whole-of-industry shifts that would influence operations of the Project.

4.2.14 Tourism

Representative Comment(s)

Increased noise from the trucks that will affect both locals and the Howlong Golf Resort motel. This could cause a downturn in their occupancy at the motel as no one will want to stay in a place where large trucks are going past their windows.

Name Withheld – SE-126566

Response

Traffic generation for the Quarry would contribute only 2.6% of total traffic on the Riverina Highway to the west of the Quarry and a peak of no more 5 laden loads per hour (10 movements including the return). Traffic levels would be limited by operating hours and ultimately the annual limit on production would ensure transportation activities occur at reasonable levels.

It is important to acknowledge that the Riverina Highway is a State highway. These routes are managed and maintained by the NSW State Government in recognition of their importance for regional transportation activities such as freight and in the case of the Quarry, the movement of construction materials.

It is not expected that the additional traffic generated by the Quarry would be noticeable to people staying at the Howlong Gold Resort Motel to the extent that the region would become known for heavy vehicle traffic.

4.2.15 Traffic and Transport

4.2.15.1 General

Representative Comment(s)

On the information provided I object to the approval of the proposed development. It exposes us, the residents abutting the transport route, and the Howlong community to additional significant, safety, noise and health issues. These have not been addressed nor have enforceable mitigation strategies been identified.

Leigh Ashford – SE-126602

Response

The characterisation of impacts as ‘significant’ in the context of transport-related safety, noise generation and health issues is not supported by the outcomes of technical assessments.

- A Noise Impact Assessment (Octave 2020) has assessed traffic noise and predicted there would be negligible changes to road traffic noise generation. The

sound of a single truck passing would remain the same is it is experienced now, with a minor change to frequency of this noise source.

- The Quarry is predicted to generate 2.6% of daily traffic and 18.3% of daily heavy vehicles on the Riverina Highway to the west of the Quarry. This change is not considered likely to result in road additional safety risks. The Road Transport Assessment prepared by TTPP (2020a) also reviews historic road accident data and could not identify any factors that would be exacerbated by the proposed change in traffic levels.
- There is no indication that transportation activities would present significant additional risks to the health of the local community be that through road safety, dust, noise or other concerns that have been identified in submission.

Nor is it appropriate to indicate that these matters have not been addressed as the Applicant has commissioned detailed studies to investigate and assessment potential environmental risks.

It is acknowledged that the Applicant has presented a proposal that would change traffic conditions along the Riverina Highway, which is a State road constructed to carry freight traffic, including heavy vehicles. A summary of mitigation and management measures that have been committed by the Applicant is presented in **Appendix 2** and details each of the mitigation strategies that would be given force through conditions of consent. A component of these commitments is ongoing monitoring and reporting on environmental performance outcomes. In addition, the Project would be subject to independent environmental audits every three years that would assess compliance with conditions of consent. Finally, the Applicant would maintain a system to record, investigate and respond to any complaints received by residents in Howlong. The Applicant encourages community members who experience poor environmental performance to contact the Company to advise them of the matter. In this manner the Applicant and Project can seek continual improvement of environmental performance and focus attention on improving the matters that are of greatest concern to the community.

4.2.15.2 Dust from Vehicles

Representative Comment(s)

Increased air pollution from diesel fumes, road dust and contaminant dust from the truck loads which will impact all businesses and residents of, and persons in the vicinity of, Hawkins Street and Sturt Street,…

Increased air pollution from diesel fumes, road dust and contaminant dust from the truck loads which will impact those businesses that provide outdoor seating areas for their customers.

Name Withheld – SE-126471

Response

An Air Quality Impact Assessment (AQIA) for the Project was undertaken by Todoroski Air Sciences Pty Ltd and presented as Part 6 of the *Specialist Consultant Studies Compendium* for the EIS. The assessment considered potential impacts associated with predicted dust dispersion from the Project at the five closest residences in the vicinity of the Quarry Site. The assessment confirmed that all of the assessed sensitive receptors, (within 2km of the Quarry Site), are predicted to experience levels below the relevant criteria for each of the assessed dust metrics ($PM_{2.5}$, PM_{10}, Total Suspended Particulates and Deposited Dust).

All vehicles would be covered prior to leaving the Quarry Site and would be restricted to travelling on designated routes, which has been optimised to reduce the distance of travel and hence diesel consumption.

4.2.15.3 Road Noise

Representative Comment(s)

Increased road/traffic noise which will impact all businesses and residents of, and persons in the vicinity of, Hawkins Street and Sturt Street,…

Increased road/traffic noise which will impact those businesses that provide outdoor seating areas for their customers.

Name Withheld – SE-126471

Did the study take that into consideration of the noise waking the residents impacted by the extra 12 trucks per hour/ 80 per day. It did not consider them.

Name Withheld – SE-126557

Response

While the total number of heavy vehicles passing along the Riverina Highway through Howlong to destinations in NSW and Victoria would increase under the Project, the total number of vehicles on the road would increase only marginally. Technical assessment of road noise generation predicted a negligible (1dB(A)) increase in road noise over the daytime period. In practical terms, a 1dB(A) increase or change in noise level is difficult for the average human ear to perceive.

The noise of a single truck passing would remain consistent with the noise generated by heavy vehicles that are approved to use the road now.

It is reiterated that the Riverina Highway is a State road that has been built and is maintained to manage freight traffic, including construction materials. Should an alternate route be identified that bypasses Howlong and is efficient for road transport, the Applicant would welcome its use.

4.2.15.4 Traffic Levels

Representative Comment(s)

The current report appears to have all quarry traffic travelling west from Quarry Road (Table 4.2) perhaps the submission should provide for a variety of heavy vehicles (as has been advised in para 2 of Section 4.1) which would enable quarry heavy traffic other than B Doubles to use the Riverina Highway both east and west of Quarry Road.

Name Withheld – SE-125844

Should the quarry operator wish, they could therefore assign 30 loaded truck movements, or 75% of the maximum allowable per day, between the hours of 5pm and 10pm. This could be as often as they like with assumed impunity over the next 30 years…

How do the residents of Howlong know that the quarry is in fact only scheduling 6 trucks per hour or 40 per day? It appears a throw away appeasement to offset the size of the expansion…

Name Withheld – SE-126628

Response

The Applicant has committed to limit heavy vehicle despatch to no more than 5 laden loads per hour and 40 laden loads per day. These loads would produce a return movement, so total heavy vehicles (in both directions) would be limited to 10 per hour and 80 per day. This limit does not include light vehicles or occasional service vehicles that may access the Quarry.

A range of heavy vehicles may access the Quarry to transport material. However, B-Double vehicles would be the most common vehicle type used.

Weighbridge records would be used to record hourly truck despatches from the Quarry and the total daily tally of laden vehicles that transported product. Traffic levels would be collated and reported annually in reporting on the Quarry's operation. The traffic levels would be subject to compliance actions and independent audit should it be considered that more trucks are leaving the Quarry in a given period than are currently approved.

4.2.15.5 Transport Route

Representative Comment(s)

Access roads around Howlong are not designed for regular truck use, these are country roads for local use.

Name Withheld – SE-126466

Response

The Riverina Highway is a State road designed and maintained to carry freight traffic. The traffic route for the Quarry follows State roads or highways for the majority of planned routes. Local roads would only be accessed to reach final destinations and drivers would be required to limit access to local roads as much as practically possible under the requirements of the Driver's Code of Conduct.

Representative Comment(s)

A designated truck bypass will provide a long-term solution to the many issues associated with increasing truck traffic through the centre of town. A designated truck bypass will also be an effective way of balancing the need for development and rights of residents to live in a safe, non-polluted, noise limited township.

Name Withheld – SE-126530

We could even consider a temporary bypass by utilizing the Kywong-Howlong Road and Drew Lane back to Sturt Street; there is also a by-pass road (Jindera Road) that would take vehicles into Albury and the Hume Highway to all points north and south.

Kevin Donovan – SE-126526

Response

The Applicant would support the use of a bypass around Howlong should it be constructed by the relevant road authorities. Given the relatively small volume of traffic that would be generated by the Project and the fact that it would likely be a State road, it is not appropriate that road upgrades such as a bypass be the responsibility of the Applicant. An upgrade to the intersection of the Riverina Highway and the Quarry Access Road would be constructed in light of anticipated peak traffic levels.

Representative Comment(s)

It is considered that the proposal should have properly considered the removal of the barriers and blockages affecting direct access to Albury as part of the assessment and not just dismissed them outright.

Leigh Ashford – SE-126602

Response

It is understood that the limitation on direct access to Albury along the Riverina Highway is the result of truck mass limits on this road. Given the amount of work required to resolve this matter and the relatively small contribution of the Quarry to total traffic, it is not appropriate that the Applicant be responsible for upgrading roads in this location.

Regardless, as long as the limits would not be exceeded, empty vehicles returning to the Quarry may access the Quarry Access Road from Albury directly along the Riverina Highway. However, this is not expected to be a regular occurrence.

Representative Comment(s)

Trips required for Albury, Wodonga and regions to the east of the quarry can also utilise approved 25/26 metre B Double routes such as the Riverina Highway (eastwards), Bungowannah Rd, Hueske Rd and Urana Rd.

Name Withheld – SE-126628

Response

It is true that the described route is approved for 25/26 metre B-Double traffic and should deliveries be required to the north of Albury this route may be required. However, it would require a longer journey, generally on local roads that may not be constructed to the standard of the Riverina Highway. It is preferred that the existing and proposed route be used as this relies upon State roads constructed to manage the traffic that is required.

4.2.15.6 Road Safety

Representative Comment(s)

This proposal is highly likely to result in an increased risk of accidents due to a high volume of heavy vehicles.

Name Withheld – SE-126524

The proposed quarry expansion would put increased pressure on what is already a barely adequate road system for this area. There are already a high number of trucks using the logic centre, saleyards etc and there are often delays and many near miss accidents. Increasing the traffic in an area already black spot prone without improvements to infrastructure would be dangerous in my opinion.

Name Withheld – SE-126539

Response

The concern in the community regarding road safety is acknowledged. TTPP undertook a comprehensive review of traffic accidents in the vicinity of the Quarry and towards Howlong for the Road Transport Assessment (TTPP, 2020). The majority of accidents were rear-end type accidents and only a small proportion involved heavy vehicles. There was no indication that the change to traffic levels would increase the likelihood of accidents.

Regardless of the above, it should be noted Quarry traffic would be managed in accordance with strict protocols enforced through a Driver's Code of Conduct and Traffic Management Plan. All drivers would be required to be trained and sign agreement with the code of conduct that contains detailed advice on disciplinary procedures. Drivers risk losing their employment if the code is not followed. It is not clear how many of the heavy vehicles currently using the Riverina Highway operate under similar requirements.

Representative Comment(s)

It is especially difficult for parked vehicles reversing, near intersection Hawkins and Sturt St… Drivers either hypervigilant or inattentive in the process of reversing, a truck will collect them.

Name Withheld – SE-126557

Many pedestrians and cyclists use the bridges and Sturt Street, walking from the camping area into the town, or accessing the Lions Park for swmming (sic)*, camping, picnics etc. there is not even a safe footpath along Sturt Street to the bridges so those people have to walk on the road.*

Judith Thomas – SE-126623

Besides the intersection of Ashford Road and the Riverina Highway, there are 15 other intersections along the proposed transport route through Howlong. They are all affected by fog and 10 affected by low sun angles.

Leigh Ashford – SE-126602

There are potential safety concerns for school children in this area as well, especially those riding their bikes to and from Howlong Public school along the road side as there are no formed footpaths available.

Name Withheld – SE-126628

Response

Drivers that are employed to transport product from the Quarry are professional truck drivers whose livelihood relies upon safe practices. Drivers are trained and would operate under a Driver's Code of Conduct and Traffic Management Plan. Allowing space for reversing cars and being mindful of pedestrians is simple courteous driving and should be common practice. Drivers would also be used to managing local features such as fog, sun glare and heavy rainfall. These matters are also described in the Driver's Code of Conduct.

School zones, bus stops and crossings are identified in transport route maps contained in the Driver's Code of Conduct (see **Appendix 11**). This would ensure that drivers are aware of these local features to the greatest extent possible.

It is not possible to ensure that every driver follows these rules at all times. Therefore, the Applicant would operate a complaints management system and would encourage community members that observe poor driving practices and behaviour to contact the operator. It is generally possible to track drivers using satellite navigation (common on Hanson vehicles amongst others), which provides information on speed, route and detailed information on the management of a vehicle.

Representative Comment(s)

The main street has experienced significant increases in truck movements in recent years from both sides of the river, this additional increase in heavy vehicles will significantly increase the risk of accidents.

David Longley – SE-126533

Response

The Road Transport Assessment (TTPP, 2020) assessed the volume of traffic now and predicted into the future assuming the presence of the Quarry, as proposed. There is no indication that the Riverina Highway is reaching capacity or would require upgrade as a result of the Project. Regardless, it is expected that should traffic substantially increase in Howlong, a bypass or other solution would need to be considered by the NSW State government. The Applicant supports any measures that may be implemented by the NSW State government to improve road safety.

4.2.15.7 Driver Behaviour

Representative Comment(s)

Trucks already use residential "side" streets to avoid the main roads and this causes significant noise and hazards for residents. Increasing this to the scale proposed in this development would be a serious concern to residents safety.

Mark Smit – SE-126545

The Caltex garage on the eastern outskirts of Howlong (which provides food services) will undoubtedly benefit with more truck movements and quarry growth. There is capacity for kerbside parallel and off road parking which is a magnet to passing trucks from 6am to 8pm. As a consequence, private driveways can be blocked and truck motors left running while purchases are made.

Name Withheld – SE-126628

Streets in Howlong, other than the Riverina Highway are not authorised B Double routes. This does not stop such vehicles however, from using local streets from time to time to perhaps avoid shopping centre traffic and school zones.

Name Withheld – SE-126628

In the proposed Drivers Code, drivers be made aware of the presence of threatened native species in the area, and drive with care when approaching them.

Name Withheld – SE-126618

Response

As noted above, drivers that are employed to transport Quarry products would be required to operate in accordance with a Driver's Code of Conduct and Traffic Management Plan. It is not clear what management protocols apply to other operations in the area that generate heavy vehicle traffic in terms of managing driver behaviour. In addition to this, the Applicant would maintain a complaint register and implement protocols for recording complaints, investigating matters raised and responding to complainants.

The concerns raised in these submissions are examples of poor behaviour that may require disciplinary action. There has been no indication in recent times of complaints relating to existing operations. Many heavy vehicles that transport Quarry products operate with in-vehicle tracking systems that use satellite navigation to track vehicles and in some cases record management of speed limit exceedances or other indicators of poor behaviour. The Driver's Code of Conduct would contain disciplinary protocols for drivers that fail to adhere to the Code's requirements. Drivers risk cancellation of contracts and loss of employment for not following the necessary protocols.

4.2.15.8 Road Degradation

Representative Comment(s)

The ACTUAL COSTS [sic] *to the project proponent FOR THE USE OF THE PUBLIC ROAD SYSTEM* [sic]*, if properly calculated, would in all likelihood make the project less attractive economically.*

Narelle and Graham Ashford – SE-126555

The Riverina Highway with the towns limits is already struggling to maintain it's structural integrity under the weight of current traffic volume.

Name Withheld – SE-126628

Response

The Riverina Highway is a State road designed and maintained to carry freight traffic such as that proposed for the Project. While there may be areas that show signs of wear, the proposed change to traffic levels would not be expected to substantially exacerbate existing road condition issues or significantly reduce the operating life of the road.

4.2.15.9 Vibration

Representative Comment(s)

Our dwelling vibrates in certain conditions when heavy vehicles pass. This is generally in summer when conditions are dry. It is expected that the 20% increase in heavy vehicles will increase the amount of vibration through the house to an unacceptable level.

Leigh Ashford – SE-126602

Response

It is not clear from the submission what causes the property to vibrate, nor its proximity to the Riverina Highway. While vibrations may be experienced from traffic on the road, the increase in traffic referred to in the submission is the change resulting from peak traffic generation,

which is not expected every hour or every day. As the Riverina Highway is a State road this route is designated for such traffic and alternative routes would be likely to have similar if not worse outcomes for residents.

4.2.16 Water Quality

Representative Comment(s)

There is also a concern for the storage of fuel at the site which could find its way into the Murray River.

Name Withheld – SE-126468

Would you please contact the EPA and ask for a ruling on storing diesel (and other toxic chemicals) on a flood plain.

Debbie and Robert Travers – SE-126290

Response

The Applicant has agreed with Council that diesel would not be stored within the Quarry Site and would rather be stored outside the floodplain on land owned by the Applicant and used for agricultural activities. While the Applicant is comfortable with the practices applied in past operations and the associated risks, it is considered appropriate to make this change. Refuelling activities would be undertaken similar to refuelling for agricultural activities with diesel transferred to a portable tank (likely on a utility vehicle) and transported to mobile equipment at the Quarry. Dedicated refuelling areas would be retained.

Representative Comment(s)

…there is a high risk that water sources will be polluted in the normal quarry operations or due to accidental spills of fuel and like pollutants.

Name Withheld – SE-126530

Human beings, fish and other aquatic life, birdlife, native animals and livestock, plants and trees all require the river to be in the most pristine condition possible. Murray River quality and flows downstream are of great concern to me overall - any changes upstream will have an affect downstream.

Name Withheld – SE-126543

Response

The risk of uncontrolled discharge of potentially sediment laden water from the Quarry Site has been previously identified and has been a key factor in design and planning of the Quarry development. The proposed flood levees would act to keep floodwaters from entering the Quarry Site but would also prevent water from leaving the site during periods of high rainfall.

The principal controls for water quality are described in Section 6.4.6 of the EIS and include the following.

- Prepare and implement a Water Management Plan including a description of surface water management procedures.

- Ensure that no water collected within the Quarry Site is discharged to any nearby watercourse. All water would be used for processing, irrigation or on-site dust suppression or would be stored and allowed to evaporate.

The Water Management Plan for the operation would also describe programs for water monitoring that would include monitoring of water quality at six monthly intervals within operating stages of the Quarry and also in the Murray River as a reference point.

This approach would ensure that water quality risks would be mitigated and water management applied throughout the life of the development.

5. EVALUATION OF THE PROJECT

5.1 INTRODUCTION

This section provides an update to the evaluation of the merits of the Project presented in Section 8 of the EIS. A number of refinements have been made to the Project to enhance Project outcomes and in direct response to the matters raised in submissions. Review of the submissions provided in response to the public exhibition of the EIS has prompted additional detailed technical assessment. The majority of assessment outcomes have not changed and in some cases, they have improved. These outcomes are summarised in this section and considered for the evaluation of the broader Project outcomes. This section also provides a final review of consequences of not proceeding with the Project and the public interest in conclusion to the document.

5.2 REFINEMENTS TO THE PROJECT

A number of refinements have been incorporated into the Project to improve environmental outcomes and management of the Quarry Site. These have included refinement to the flood levee alignment, the inclusion of an overburden emplacement for management of materials that are not useful for sand and gravel production and the inclusion of a water storage dam to better account for water take and use and to simplify the process of accounting for water use at the Quarry Site. In addition, the areas proposed for progressive revegetation in riparian areas and adjacent to the Quarry Site has been expanded to improve outcomes relating to stability of the landform and the ability to withstand flood flows (not related to the Quarry).

In consultation with Council and in response to community concerns, the Applicant has elected to store diesel fuel for Project equipment outside the floodplain on land owned by the Applicant and used for agricultural activities. This would remove this potential hazard from the floodplain and remove the risk associated with flood-related impacts.

Through detailed consultation with TfNSW, the Applicant has also agreed to an extended upgrade to the intersection of the Quarry Access Road and the Riverina Highway. This is intended to ensure that the Applicant is safely managing traffic entering and exiting the Quarry. In these discussions, the Applicant also agreed to reduce the maximum hourly traffic limits to five laden loads in any hour.

5.3 SUPPLEMENTARY ASSESSMENT

The Applicant requested its consultants to undertake a detailed review of the matters raised in submissions and provide the necessary clarification, additional information or, where needed, reassess potential impacts. In addition, a peer review of the groundwater modelling assessment was commissioned to provide third party oversight on this process. The outcomes of supplementary assessment may be summarised as follows.

- An Aboriginal Cultural Heritage Assessment was prepared by Landskape (2021) to provide more comprehensive Aboriginal community consultation and to include the outcomes of sub-surface investigations within land that has not previously been disturbed. The updated assessment was undertaken to provide

Heritage NSW, the Aboriginal community and the consent authority with greater confidence in the outcomes of this and previous investigations. The conclusions of assessment have not changed since the publication of the EIS. That is, there are no know objects, sites or areas of Aboriginal cultural heritage value within the proposed areas of disturbance. Protocols to manage any unexpected finds during the life of the Project would be described in a Heritage Management Plan for the Project.

- A Biodiversity Development Assessment Report was prepared by EnviroKey (2021) in order to ensure that the technical biodiversity assessment requirements were satisfied. The field surveys undertaken by EnviroKey have provided a greater understanding of predicted and potential residual environmental impacts. The outcomes of assessment have been clarified in accordance with the Biodiversity Assessment Methodology (2017) with the conclusions generally consistent with previous assessment. That is, minor impacts to biodiversity are predicted to occur with ongoing management of the Quarry Site in accordance with a Biodiversity and Rehabilitation Management Plan intended to ensure that development and progressive rehabilitation are implemented as proposed.
- Water Technology (2022) was commissioned to respond to the comments received from an independent peer review of the numerical groundwater modelling undertaken for the Project. Revised and updated modelling was undertaken that provided more detailed description of, and justification for, the approach taken. The application of more refined site-based data improved the understanding of aquifer behaviour and has allowed for a more robust calibration of modelling processes to measured data, improving the technical outcomes of modelling. Based on this approach, the peer review concluded that the groundwater model was ‘fit for purpose’, which was principally the satisfaction of objectives relating to the prediction of groundwater inflows to active extraction areas and through that understanding, predict water licence requirements and potential impacts to groundwater users including private bore owners and groundwater dependent ecosystems.

  The outcomes of groundwater modelling and assessment have improved predicted environmental impacts in this regard with predicted groundwater inflows within the licenced entitlements already held by the applicant (maximum of 1 776ML/year). The conclusions relating to potential impacts to groundwater users also remain consistent with previous conclusions. That is, the drawdown to groundwater levels is predicted to be largely bound by the Murray River and Black Swan Anabranch and would therefore not impact provide bore owners. Impacts to groundwater dependent ecosystems located between the extraction areas and the Murray River (within the 100m buffer that has been designated in this location) may occur as groundwater levels decrease from the river to the floor of the extraction area as the depth increases with development. However, as operating areas are not proposed to be maintained dry, the decrease in groundwater level may recover in between extraction campaigns. Further to this, the Applicant has proposed a comprehensive program of riparian corridor revegetation in these locations that would mitigate possible impacts.

A greater understanding of the possible interaction of the surface water of the Murray River and the groundwater setting has also been achieved. It is concluded that water that is lost from the Murray River as a result of extraction activities would a minor compared to average daily river flow volumes. This volume would also be accounted for in groundwater licence requirements for the Project and included in the Applicant's accounting for dewatering processes.

- Further investigation of potential flooding-related risks was commissioned to gain a better understanding of risks to private property and public infrastructure as well as erosion risks associated with flood behaviour following the construction of the proposed flood levees. The reporting identified minimal changes to flood behaviour in proximity to private residences and the Riverina Highway and impacts to private property (Water Technology, 2021a). Options to mitigate erosion risks during flood flows was also investigated (Water Technology, 2021b). Water Technology (2021b) considered possible risks from shear stresses during flooding causing lateral migration of the riverbank as well as the risk of avulsion through overland connection of extraction areas and the river. The Applicant's commitments to construct flood levees, revegetate riparian corridors and establish a minimum 100m revegetated buffer between extraction areas and the Murray River would mitigate potential erosive risks.
- Additional technical assessment of low frequency noise generation and possible impacts was undertaken by Octave Acoustics (2020) and concluded there would be no discernible impact from annoying noise characteristics due to the Project.

The outcomes of supplementary technical assessments undertaken for the Project continue to support the overall conclusion that the Project presents relatively minor environmental risks that would be managed through the Applicant's commitments and enforced through conditions of consent.

5.4 UPDATED JUSTIFICATION OF THE PROJECT

5.4.1 Biophysical Considerations

The supplementary assessments undertaken for the Project have provided a more comprehensive understanding of the potential environmental risks associated with the Project. The following presents a summary of each of the biophysical assessment outcomes of the Project. **Appendix 2** provides an updated summary of environmental management and mitigation measures which have been committed to by the Applicant.

Traffic and Transport

The review of submissions has resulted in changes to the proposed traffic limits and extension of the proposed upgrade to the intersection of the Quarry Access Road and the Riverina Highway. The Project would result in no more than 80 heavy vehicle movements (40 laden loads) on any operating day and no more than 10 heavy vehicle movements (5 laden loads) in an hour.

The Quarry is predicted to contribute a maximum of 18.3% of daily heavy vehicles on the Riverina Highway west of the Property (or approximately one in every five or six heavy vehicles) and 14.5% of heavy vehicle traffic on Sturt Street South of the Riverina Highway (or approximately one in every seven vehicles). The proportion of heavy vehicles would increase on a Saturday should the Quarry be operating at peak capacity at this time.

The proposed upgrade to the intersection of the Quarry Access Road and the Riverina Highway would be undertaken in accordance with the Austroads requirements and in consultation with TfNSW. Consent under Section 138 of the *Roads Act 1993* would be required for these works and Works Authorisation Deed agreed.

Assessment of the potential traffic-related risks has concluded that the existing road network would accommodate the proposed traffic levels with acceptable impacts to the capacity, efficiency and safety of the road network.

Driver behaviour would be managed in accordance with a Traffic Management Plan and Driver's Code of Conduct.

Groundwater

Water Technology (2022) has undertaken a more detailed investigation of potential groundwater impacts including updated numerical groundwater modelling that has been calibrated to site-based observations. The Quarry operation would continue to draw water from the groundwater setting under licence. These inflows would be used for irrigated agriculture on the broader property consistent with current practices. It is likely that the requirements for agricultural use would exceed inflow volumes. All groundwater inflows removed from the setting would be metered to provide accurate records of water use from the aquifer. Estimates of evaporative loses from open water and records of rainfall would be used to predict the ongoing water use for the Project. The Applicant currently holds more than sufficient water access licence entitlements to account for predicted groundwater inflows.

Peer review of the numerical groundwater modelling has concluded that the groundwater model is 'fit for purpose' which is principally the estimation of groundwater inflows to enable an accurate assessment of potential impacts. The outcomes of modelling and impact assessment has concluded there would be no impacts to registered bore users. In addition, identified potential terrestrial groundwater dependent ecosystems located in the 100m buffer area between the extraction areas and the Murray River may experience a reduction in available groundwater as the water level decreases with increasing depth of extraction. This is likely to be mitigated through variation in the timing for dewatering and extraction which may result in fluctuations in groundwater levels rather than steady decline. In addition, the Applicant has committed to revegetation of the 100m buffer area including riparian corridors which would mitigate possible impacts to GDEs.

The predicted interaction of surface water in the Murray River and the groundwater setting has been assessed and predictions of water exchange between these systems predicted. The predicted volume of water induced from the Murray River due to extraction activities would represent only a small component of average daily flow in the river. This water use would be accounted for through licenced groundwater use, consistent with most irrigators that access water from the Upper Murray alluvial setting.

The principal change to the groundwater setting would be the development of ponds in the final landform. These areas would require an ongoing licence entitlement to account for water removed for ongoing irrigation practices and evaporation (lower than that currently held by the Applicant). Flood levees would remain in the landform and a schedule for pumping water for irrigation in the final landform would be applied to minimise salinisation of the rehabilitated ponds. These practices would be formalised in a Water Management Plan.

Potential impacts to the groundwater setting would be mitigated and managed through the implementation of a Water Management Plan that would include a comprehensive monitoring program that would ensure advanced identification of unexpected outcomes.

It is concluded that the Project would continue to operate with minimal impacts to the regional groundwater setting.

Flooding and Surface Water

Flooding-related risks have been assessed in relation to the potential risk of flood levee construction with the floodplain. A detailed review of flood modelling outcomes has demonstrated there would be minimal changes to flood patterns at private residences and public infrastructure.

The flood levees would become an important mitigation against flood erosion risks which would otherwise risk lateral migration of riverbanks and avulsion risks associated with overland flow to extraction areas. In addition, the Applicant's commitments to establish a 100m revegetated buffer between extraction areas and the Murray River and the proposed program of riparian revegetation would stabilise areas that may otherwise be prone to erosive risks as a result of flooding shear stresses.

Given that all operations would occur within a closed system, with no contributing catchment of clean water and there would be no discharge outside the levee banks, risks to water quality outside of the proposed levees would be minimal. The Quarry Access Road would be regularly graded and maintained to ensure that it is not a substantial source of sediment in the environment. Management procedures would be established to minimise the potential for spills or contamination within the Quarry Site.

Operations would not draw water from the Murray River or adjoining watercourses directly. In addition, the minor loss of rainfall runoff from within the catchment area delineated by the levee banks would be minor in the context of the regulated and natural river flow levels. Therefore, there would be negligible impacts on water availability for downstream users.

The proposed upgrade to the bridge over the Black Swan Anabranch would not require modifications to the foundations of the bridge and therefore impacts to the structural stability of the bank of the Black Swan Anabranch would be avoided.

As a result, it is concluded that the Project would continue to operate with minimal risk of impact to surface water resources.

Noise

Predictive noise modelling assessment indicates that the predicted operational noise levels are not anticipated to exceed the relevant criteria at any residence.

The predicted public road noise level results show that the road noise assessment criteria would be satisfied and that overall, only a minor increase to existing conditions of 1dB(A) during daytime operations is predicted along two sections of road. In practice, this increase in sound level is an imperceptible change.

Operational activities and Project-related traffic noise would not be likely to cause sleep disturbance and an assessment of low frequency noise (or annoying characteristics) indicates there is minimal risk of perceived impact.

As a result, it is concluded that the Project would continue to operate with minimal risk of adverse noise-related impacts.

Air Quality

The results of predictive dust dispersion modelling undertaken by Todoroski (2020) based on the operation of the Quarry at full capacity has concluded that the Project would comply with all impact assessment criteria for each relevant averaging period for TSP, $PM_{2.5}$, PM_{10}, and dust deposition.

The Applicant would continue to implement appropriate operational and management measures to manage dust emissions.

As a result, it is concluded that the Project would continue to operate with minimal risk of adverse air quality-related impacts.

Land Resources

The Land Resources Assessment undertaken by AES (2020a) indicates that with adherence to the recommended soil and growth medium stripping, handling, stockpiling procedures and other management practices, together with appropriate rehabilitation practices, the Project would result in a minimal impact to soils and land capability.

The Project would not impact adversely on the agricultural potential of the land given the existing land uses and the prevalence of moderate capability soils within the Quarry Site.

As a result, it is concluded that the Project would continue to operate with minimal risk of adverse land resource-related impacts.

Biodiversity

An updated BDAR has been prepared to ensure the technical requirements of biodiversity assessment have been satisfied. The outcomes of field survey by EnviroKey (2021) have added to previous field survey. The following general conclusions relate to the biodiversity impacts of the Project.

- Biodiversity impacts associated with 0.41ha of native vegetation clearing would not result in a significant impact to threatened flora or fauna.
- An assessed biodiversity credit obligation of one ecosystem credit for PCT 5: *River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion* (OEH, 2020b) would be required to offset the residual biodiversity impacts of the Project. This obligation would be

satisfied through credit purchase on the market or direct payment to the Biodiversity Conservation Trust in accordance with the requirements of the NSW Biodiversity Offsetting Scheme under the *Biodiversity Conservation Act 2016*.

- No impacts to Matters of National Environment Significance would occur under the Project and therefore the matter does not require assessment and approval under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*
- Sloane's Froglet (*Crinina sloanei*) has not been recorded at the Property on which the Quarry Site is located.
- Impacts to other threatened species with potential to occur within the Property would be insignificant because:
  - existing habitat within the proposed disturbance footprint has been subject to disturbance;
  - proposed vegetation clearing would result in minimal disturbance of potential habitat areas; and
  - potential habitat within and in the vicinity of the disturbance footprint would be retained, where possible.
- The Quarry does not contain geological features that may provide habitat for threatened flora or fauna. However, once decommissioned and rehabilitated, extraction areas are likely to provide wetland habitat suitable for threatened and other species.
- The Applicant would backfill and reinstate a 100m buffer between extraction operations and the top bank of the Murray River. The Applicant would also revegetate riparian areas surrounding proposed disturbance areas. These activities would enhance local biodiversity values.
- The Quarry Site does not support 'core Koala habitat' under the *SEPP (Koala Habitat Protection) 2019*.

As a result, it is concluded that the Project would continue to operate with minimal risk of adverse biodiversity-related impacts.

Cultural Heritage

An Aboriginal and Historic Cultural Heritage Assessment was prepared by Landskape (2021) and included the outcomes of field survey including subsurface investigation in the Stage 4 extraction area. These assessment outcomes added to the previous archaeological field surveys undertaken for the Project and presented in the EIS.

- No artefacts, sites or areas of Aboriginal cultural value were identified within the disturbance areas for the Quarry Site during field surveys or subsurface investigations.
- A single Aboriginal site (Howlong 1) has been identified outside the area of proposed disturbance. The Applicant has agreed to fence off this area to avoid inadvertent impact including from agricultural activities on the property.

- The historic heritage items in the vicinity of the Property would not be adversely impacted by the Project.
- Protocols to manage any unexpected finds during the life of the Project would be described in a Heritage Management Plan for the Project.

As a result, it is concluded that the Project would continue to operate with minimal risk of adverse cultural heritage-related impacts.

Visibility

The visual assessment undertaken by AES (2020d) and Realm (2020) determined that vegetation, distance, intervening topography, and daytime only operating hours together with the proposed mitigation measures would continue to effectively screen the Quarry from local vantage points and residences for the life of the Project resulting in minimal visual and lighting impacts.

Public Safety and Hazards

The Applicant would ensure that all activities with the potential to initiate bush fire are appropriately managed. The storage of diesel fuel for the Project has been relocated offsite to a property owned by the Applicant and outside the floodplain area. As a result, it is concluded that the Project would continue to operate with minimal risk of adverse public safety and hazard-related impacts.

5.4.2 Economic and Social Considerations

The economic and social implications of the Project remain largely unchanged as result of the review of public and Government agency submissions. The Applicant has a greater understanding of the concerns of some residents of Howlong and has presented a Driver's Code of Conduct in advance of an approval of the Project in order to demonstrate its commitment to the management of transportation activities.

It remains the conclusion of the Applicant and this document that the net economic benefits of the Project would outweigh the costs as the Project would:

- contribute towards the supply of sand and gravel products to markets in NSW and Victoria;
- provide ongoing employment opportunities directly and indirectly;
- contribute to the continued economic growth at local, regional, State and National levels through flow-on effects; and
- avoid, minimise and/or mitigate environmental and social impacts to the greatest extent practicable which in turn relates to the economic costs of the Project.

The concerns raised by the community regarding social amenity within Howlong, principally relate to the experience of heavy vehicles travelling through urban areas. Concerns regarding road safety, truck noise and dust and simply the change to the experience of visiting a café in town have been raised in submissions and have been reviewed by the Applicant. However, it not agreed that the Project would result in the expected impacts as expressed in submissions. At

a peak of operations (40 laden trucks in a day), the Project would result in only minor changes to total traffic on the Riverina Highway through Howlong. There would be a greater proportionate change to heavy vehicle numbers (18.3% of total heavy vehicle traffic) when traffic is at its peak, however this would not be expected every day or every week. The limit of five laden loads in any hour would mean that on average a truck would depart the Quarry every 12 minutes.

It should also be noted that the Project would result in social benefits through the provision of employment opportunities which would build human capital in the region. The Project would also open up of an important source of sand and gravel for local markets and the broader, growing region. The Applicant would prepare and implement a Community and Stakeholder Engagement Plan that would describe ongoing engagement activities and also consult with the community on an ongoing basis through the formation of a Community Consultative Committee. Through that forum, the Applicant would keep the community informed of the development's progress and be able to hear first-hand the feedback from the community.

5.5 THE CONSEQUENCES OF NOT PROCEEDING WITH THE PROJECT

The consequences of not proceeding with the Project remain unchanged since the preparation of the EIS and include the following.

i) The opportunity to establish secure access to and provide sand and gravel products to construction markets in both NSW and Victoria would be forgone.

ii) The opportunity to increase employment opportunities in the local area would be foregone. This would also impact on the economic activity of the local community and Federation LGA.

iii) Payments of elevated rates (to Federation Council), State and federal taxes would be foregone.

iv) The various adverse impacts attributed to the Project that are identified throughout Project documents would not occur. It is considered that the level of predicted impacts arising from the Project are acceptable given the extent of mitigation measures proposed to be given force through conditions of consent.

v) The benefits of proceeding with the proposed expansion of the Howlong Sand and Gravel Quarry are considered to outweigh the predicted impacts on the environment that would result if the Project was approved.

5.6 THE SUITABILITY OF THE SITE

The Quarry Site is an existing extractive industry development, albeit operating at a much lower intensity than is proposed for the Project. Regardless, the potential risks are well understood by the Applicant through past practices. The proposed Project would adapt existing practices to a higher production target with the aim of become an important source of sand and gravel to the region (Albury/Wodonga and Benalla) and to construction activities as far away as Melbourne and for regional infrastructure projects such as Snowy 2.0.

The location of the Quarry Site is considered ideal, as it is in a remote location away from residences, urban areas and has direct access to the Riverina Highway, a State road that connects the Quarry Site to locations in NSW and Victoria. The outcomes of technical assessment supports these conclusions with minimal operational impacts to local amenity predicted. Regardless of this, the proximity of the development to the Murray River has required detailed assessment and planning to ensure that potential impacts to the river are assessed and are acceptable. The key risks to the Murray River have been identified and addressed as follows.

- **Physical impacts to the Murray River** – There would be no direct use or encroachment upon the Murray River. The Applicant's commitment to revegetate riparian areas and the 100m buffer between the extraction areas and the river would improve the physical condition of the river in this location by enhancing stability and providing habitat for native fauna.
- **Water quality in the Murray River** – The Quarry has been designed to contain all water within the flood levees with groundwater inflows to active extraction areas pumped to the broader property to support irrigated agriculture. This is consistent with current practices and would be expanded to manage groundwater inflow volumes or in response to agricultural demand. There would be no risk to downstream water quality for water users including where the water is used as drinking water.
- **Draw of water from the Murray River** – No water would be drawn directly from the Murray River for use in the Quarry Site. The numerical groundwater modelling assessment has predicted the level of interaction between the river and the groundwater setting and predicted the total volume of water lost from the Murray River as a result of extraction activities (including changes to river seepage which is water drawn from the river towards the aquifer, and groundwater baseflow, which is the loss of water that would normally flow from the aquifer to the river). The assessed maximum volume of water lost from the Murray River is a small proportion of daily river flow volumes and therefore would not have a discernible impact on downstream water availability (maximum of 2.7ML/day which may be compared to winter river flows of 2 000ML/day (0.14%) and summer flows of 7 000ML/day (0.04%)). All water drawn from the Murray River would be accounted for through the Applicant's groundwater access licensing consistent with irrigators along the Murray River that draw water from the alluvial aquifer that is highly connected to the river.
- **Flood-related risks to the Quarry Site and the geomorphology of the river** – Flood levees would be constructed to limit flood water flows into the Quarry Site. The levels would be built to withstand a 1% Average Exceedance Probability flood event. The levees would also reduce flood-related erosion risks in the landform. Further mitigation would be provided through the establishment of a 100m revegetated buffer between the Murray River and extraction areas and the progressive revegetation of riparian areas in the vicinity of the Quarry Site, including along the Black Swan Anabranch. Therefore, risks to impacts within the Quarry Site and to the river in the vicinity of the Quarry would be suitably mitigated.

- **Flood behaviour changes impacting the floodplain** – A flood modelling assessment has considered possible risks to private property and public infrastructure and concluded that there would be no evident change to flood levels at these locations (including for the Riverina Highway). Access to the Quarry Site is predicted to be cut off under most flooding conditions and therefore changes to flood levels along the access road have no material effect on site access.
- **Quarry Site closure** – The conceptual final landform retains flood levees and features wetland areas surrounded by native vegetation. The water quality of the wetland areas would be managed through continued use of water for irrigation which would naturally refresh the water by removing salts with the water taken and inducing replenishment from the groundwater setting. Although it is considered unlikely, should irrigation activities not be tenable at closure, a strategy for managing water quality would be required. This would include removal of flood levees and the establishment of rock-lined entry and exit points to direct flood flows and mitigate potential erosion risks. The flood flows would provide for the needed refresh of wetlands that would limit salinity in the water bodies. These matters would be considered in detail in a Closure Strategy for the Project and therefore represent acceptable long-term risks to the establishment of a passive and rehabilitated landform.

Another aspect of the suitability of the Quarry Site for the proposed land use is the intended use of available transport routes. A key issue raised in objections to the development was the proposed change to traffic levels and associated amenity impacts for the residents of Howlong. As noted above, the Project would rely on the Riverina Highway which passes through Howlong to the west of the Quarry Site. The road is a State road in this location and has been built to carry freight loads and connect regional towns along the Murray River. Technical assessment of amenity-related impacts has concluded that impacts for the residents of Howlong would be acceptable and represent only a minor change to existing conditions. The Applicant would support any Government-funded programs for a vehicular bypass of Howlong. It is proposed that ongoing environmental management, the implementation of a Driver's Code of Conduct and a complaints protocol would ensure that transport activities are being managed in an appropriate manner that adapts to the concerns of residents. On this basis, it is considered that the use of the proposed transport route is the most suitable for the development and would result in acceptable changes to traffic levels and road safety and amenity in Howlong.

5.7 THE PUBLIC INTEREST

Review of submissions received from the public and Government agencies has led to refinement of some elements of the Project to improve environmental and management outcomes. Additional technical assessment of the Project has provided a greater understanding of the potential environmental risks. However, the outcomes of assessment remain largely consistent with those presented in the EIS. The Project incorporates a range of design and operational mitigation measures to ensure all relevant statutory goals and criteria, environmental objectives and reasonable community expectations are satisfied. These measures would be given force through conditions of consent which would include requirements for ongoing reporting, auditing, and compliance management.

The Quarry would provide important social and economic benefits through employment (directly and indirectly), local spending on consumables and maintenance and the distribution of this contribution through the local community. The Project would become an important supplier of sand and gravel products in both NSW and Victoria. The Federation LGA features predominantly agricultural industries, and the development of a viable extractive industry operation would provide much needed economic diversity.

The predicted environmental impacts of the Project are considered acceptable and would be managed and monitored over the life of the Project. It is concluded that the Project would result is a net benefit for the local community, the Federation LGA and the State of NSW and therefore it is considered to be in the public interest.

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