Statement of Environmental Effects: Umberumberka Flood Mitigation Sand Quarry

Umberumberka Creek
Silverton, NSW
For Consolidated Mining and Civil Pty Ltd

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Rev	Purpose of document	Author	Reviewer	Issue date
A	Internal review	E. Clarke	C. Alderton	29/9/2022
B	Draft for client comment	C. Alderton	C. Alderton	3/11/2022
C	Draft for LOC	C. Alderton	C. Alderton	17/11/2022
0	Final for consent	C. Alderton	C. Alderton	26/04/2023
1	Final include amendments requested by Crown Lands	C. Alderton	C. Alderton	03/05/2023

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1.0 Introduction

1.1 Project background and description

The proposed flood mitigation sand quarry is north-west of Broken Hill and is located in the Unincorporated area of Western New South Wales, at Silverton. The land is referred to as Umberumberka Creek and runs adjacent to Silverton Road (refer to Figure 1).

The proposed project will be located on crown land stretching from Gipps Street, west of Penrose Park, along Umberumberka Creek to Lot 7307 DP118085.

Table 1: Cadastre and tenure details

Quarry name	Lot and DP	Tenure	Disturbance history
Umberumberka Flood Mitigation quarry	Crown Land	Western lands lease	Flood mitigation project to project Silverton township from flooding, utilising existing tracks and creek accesses
Stockpile area 1	Lot 1 to Lot 4 DP1410	Freehold	Disturbed area for stockpiling sand

1.2 Objectives of the proposal

The objective of this proposal is to remove a build-up of sand as a flood mitigation measure to reduce potential flooding of the Silverton Township and secure a source of sand for the mining and construction industries. The sand is proposed to be used as a construction material for the production of cement. There are limited alternative sources of sand in the area. This proposal aims to address the supply issue by making additional resources available.

Construction sand, soil, gravel or similar materials (which are not prescribed as minerals within the meaning of the Mining Act 1992) are defined as 'extractive materials' in the Extractive Industries Dredging and other Extraction in Riparian Areas (Department of Department of Planning and Infrastructure (September 1996).

The proposed sand quarry has the following characteristics (refer Table 2), with data gained by Geographic Information System analysis. Extraction rates are based on historical quarrying in nearby locations under current and historical licences.

Table 2: Characteristis of the propsoed quarry

Quarry name	Size (Ha)	Potential resource (m³)	Potential resource (T)	Lifespan (yrs)	Comments
Umberumberka Flood Mitigation quarry	12.4 (est 6.2 usable)	124,000	173,600	5	New quarry, located to minimise impact, utilising existing tracks

1.3 Characteristics of the resource

The proposed quarry area contains sand, which is ideal for the construction industry and the production of concrete. To be economically viable, the sand quarry needs to be located where there is suitable material available and within a short distance from its end use. An analysis of the material in similar creeks revealed the raw material contains 7% clay and fine silt, which after washing will be reduced to 3% clay and fine silt, which is ideal for the proposed use.
The potential resource and quality have been confirmed on site through historical quarrying upstream and through other existing quarries in the area (production and quality).

1.4 Description of extraction operation

CMC were the successful recipients to a Crown Lands expression of interest (EoI) process to extract sand from the creek as a flood mitigation measure. The EoI was run by Crown Lands.
The operation will be undertaken in various phases as stated in Section 1.10. The phases referred to are the gradual stripping down of sand in approximately 400mm layers across the five phases.
During the extraction process, sand will be won and loaded by a front-end loader into a dump truck (Moxy), which will then transport the sand to stockpile area (refer Appendix A). Sand will be stockpiled as required (no more than 1,500T for periods of up to three months). The sand will be progressively stripped in sections along the bed of the creek which may be up to 2.5m deep in places (quarrying will occur down to a maximum of 2m).
The sand will then be loaded on to road train transport and carted to Broken Hill for processing. After processing, the sand will be loaded directly onto trucks for delivery to customers.

1.5 Site lay out plans

The site layout is presented in Appendix A.

1.6 Site preparation

Site preparation for the proposed development will consist of:

- formally marking the proposed development area (including 'no go' zones) using flagging or bunting
- levelling the existing haulage track leading from the Silverton Road to the proposed site
- installing 'truck entering' signs and general safety signs at the quarry.

1.7 Infrastructure considerations

No permeant infrastructure will be required on site.

1.8 Potential impacts

The proposal has the potential to impact on the environment both directly and indirectly. Differing from other projects where there are construction and operation phases, this project will only include an operation phase. The direct impacts will be minor and there will be only temporary impacts on the vegetation and fauna at stockpile area and where there will be extraction of sand from the creek bed. These impacts are well known through previous projects in the area, and recovery on completion of the project will be high in this resilient landscape.

Indirect impacts include noise and potential raised dust during extraction campaigns. It is expected that extraction will take place in short campaigns of up to a week duration as dictated by demand. As observed at other similar sites, there have been no long-term indirect impacts to fauna and flora.

1.9 Rehabilitation

Rehabilitation will occur throughout the operational phase of the project. Rehabilitation will be undertaken as per the Environmental Management and Rehabilitation Plan (EMRP), Section 6. It is expected that there will be no agricultural issues during or following quarrying activities proposed are small areas or previously disturbed sites within a creek bed.

1.10 Previous and existing operations

The only other quarry activity in the area is the existing operations (licence number 636600) by Consolidated Mining and Civil Pty Ltd.

The Former Department of Industry – Lands and Water has approved an application for Consolidated Mining and Civil Pty Ltd to Request for Direct Negotiation with the department (DOC18/252648).

1.11 Timeline

The proposed timeline is an estimation based on current requirements and the timeframe for removal of sand in each year of the project. It is expected that approximately 2,400T per month will be extracted.

1.12 Consideration of the alternatives and justification

All viable alternatives have been considered, including:

- extracting sand further upstream to reduce the sand slug
- identifying other locations within the same watercourse and avoiding areas with higher environmental values
- lowering the causeway to reduce the sand slug, allowing the sand to pass downstream

Many avoidance measures have been investigated as part of the planning for this project. It is necessary to strike a balance between finding a site with minimal distance to the processing point in Broken Hill and minimising impacts on the environment. Other areas with higher environmental values have been avoided.

All above options have been considered and costed. The preferred option is presented in this SEE. The option relevant to this proposal is favoured, as it:

- was identified by Crown Lands in their flood mitigation EoI
- is close to the Silverton Road
- will utilise existing haul roads
- will have minimal impact on the quarry environment and surrounding environment
- will not cause impacts to threatened flora or fauna
- will not block fish passage
- is close enough to the processing plant to make it cost effective.

No other existing or likely future uses or activities on or near the site would be disadvantaged by this proposal. The proposal will not affect any world heritage properties, national heritage places, wetlands of international importance (Ramsar sites) or Commonwealth marine areas.

There are no other alternatives or products available to replace river sand as an additive to cement products. The substantial benefits its use provides to the local construction industry fully warrants the continued local supply of this essential product.

2.0 Planning context

2.1 Purpose of this report

The Department of Planning and Environment (DPE) is the consent authority to which this Statement of Environmental Effects (SEE) and other requested documentation will be lodged. The proposed location is in the unincorporated area of Western New South Wales. The NSW Crown Lands issue the owner's consent and extractive industry licence, as integrated development.

Environmental Planning and Assessment Act

The overarching state legislation in relation to this activity is the *Environmental Planning and Assessment Act 1979 (EP&A Act* 1979*)* and Environmental Planning and Assessment Regulation 2021. Part 4 of the Act sets the direction for making decisions in relation to proposed developments, namely state environmental planning policies (SEPP) and local environmental plans (LEP).

Under Part 4 of the *EP&A Act*, extractive industries may require development consent under a LEP or other planning instrument. Extractive industries that are located in sensitive locations, such as in or near water bodies; are greater than two hectares in area or annual/total extraction volumes are greater than regulated volumes are classed as 'designated' and an Environment Impact Statement (EIS) must be prepared.
In this case a SEE is required as under Schedule 3 of the Environmental Planning and Assessment Regulations 2021, states:

> *26 (4) This section does not apply to the following—*
> *(a) an extractive industry facility on land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies,*
> ***(b) an extractive industry facility on land in the Western Division, within the meaning of the Crown Land Management Act 2016.***

2.2 Legal permissibility

The DPE is the consent authority to which this Statement of Environmental Effects (SEE) will be lodged, following landowners consent by Crown Lands. The proposed location is in western New South Wales.

Crown Land Management Act

Licensing of Crown land facilitates multiple uses of Crown land to support its economic, social, cultural and environmental value, while ensuring its appropriate use and management. The objectives of the act are to:

The objects of this Act are:

> (a) to provide for the ownership, use and management of the Crown land of New South Wales, and
>
> (b) to provide clarity concerning the law applicable to Crown land, and

(c) to require environmental, social, cultural heritage and economic considerations to be taken into account in decision-making about Crown land, and

(d) to provide for the consistent, efficient, fair and transparent management of Crown land for the benefit of the people of New South Wales, and

(e) to facilitate the use of Crown land by the Aboriginal people of New South Wales because of the spiritual, social, cultural and economic importance of land to Aboriginal people and, where appropriate, to enable the co-management of dedicated or reserved Crown land, and

(f) to provide for the management of Crown land having regard to the principles of Crown land management.

As outlined in 5.6 Licences of Crown Land under the Act:

(1) A licence may authorise the use or occupation of Crown land for the purposes that the Minister thinks fit.

(1A) Without limiting subsection (1), a licence may authorise the use or occupation of Crown land for the purposes of accessing water on, or transporting water from or across, the land (including the use or undertaking of any ancillary works).

(2) A licence may be granted for the term that the Minister thinks fit.

(3) Subject to section 5.25, the Minister may grant a licence for any purpose over Crown land under a lease under this Act (including for the purposes of a filming project), but only with the consent of the holder of the lease.

A licence for the use and occupation of Crown land will be applied for.

Mining Act

The *Mining Act* 1992 does not apply to this proposal as the Mining Regulations (2016), Schedule 1, does not list sand as a mineral.

Local Lands Services Act

The *Local Lands Services Act 2013* (LLS Act) identifies what is classed as native vegetation and regulates the clearing of native vegetation in rural areas. Clearing of native vegetation is defined under the Act as:

(a) cutting down, felling, uprooting, thinning or otherwise removing native vegetation,

(b) killing, destroying, poisoning, ringbarking or burning native vegetation.

A Native Vegetation Regulatory (NVR) Map has been developed and identifies rural land that is regulated under the new land management framework. The project has been designed so no impacts to native vegetation will occur.

Western Local Land Services also issues stock permits, in accordance with Part 6 of the Local Land Services Act 2013. None of the proposed work is on Travelling Stock Routes (TSR's) under the management of the LLS.

Biodiversity Conservation Act

The *Biodiversity Conservation Act 2016* (BC Act) has the purpose to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development. The Act contains 14 parts and 9 schedules, Part 2 establishes the offences and limited defences under the Act. It also sets out the framework for biodiversity conservation licences that provide authorisation to undertake activities that would otherwise be an offence. Part 3 identifies areas of outstanding biodiversity value and part 4 identifies threatened species and threatened ecological communities. Part 6 establishes the biodiversity offsets scheme, including provisions for establishing a method to assess biodiversity; the creation of, and dealings with, biodiversity credits, scheme for accreditation and the Biodiversity Conservation Fund. Part 7 sets out biodiversity assessment requirements for different activities, including state significant development or infrastructure and when a Minister's concurrence is required.

Biodiversity Conservation Regulation 2017

The Biodiversity Offsets Scheme threshold is a simple, objective, risk-based test used to determine when the biodiversity assessment method and the Biodiversity Offsets Scheme apply. The Biodiversity Offsets Scheme applies to:

- local development (assessed under Part 4 of the *Environmental Planning and Assessment Act 1979*) that triggers the Biodiversity Offsets Scheme threshold or is likely to significantly affect threatened species based on the test of significance in section 7.3 of the *Biodiversity Conservation Act 2016*
- state significant development and state significant infrastructure projects, unless the Secretary of the Department of Planning and Environment and the Chief Executive of OEH determine that the project is not likely to have a significant impact
- biodiversity certification proposals
- clearing of native vegetation in urban areas and areas zoned for environmental conservation that exceeds the Biodiversity Offsets Scheme threshold and does not require development consent
- clearing of native vegetation that requires approval by the Native Vegetation Panel under the *Local Land Services Act 2013*
- activities assessed and determined under Part 5 of the *Environmental Planning and Assessment Act 1979* (generally, proposals by government entities), if proponents choose to 'opt in' to the Scheme.

The Biodiversity Conservation Regulation 2017 sets out threshold levels for when the Biodiversity Offsets Scheme will be triggered. The threshold has two elements:

- whether the amount of native vegetation being cleared exceeds a threshold area set out below
- whether the impacts occur on an area mapped on the Biodiversity Values map published by the Minister for the Environment.

If clearing and other impacts exceeds either trigger, the Biodiversity Offset Scheme applies to the proposed development including biodiversity impacts prescribed by clause 6.1 of the Biodiversity Regulation 2017.

The area threshold applies to all proposed native vegetation clearing associated with a proposal, regardless of whether this clearing is across multiple lots. The minimum lot size in the locality is 40ha to less than 1,000ha, meaning the threshold for vegetation clearing is 1ha or more to commence the BOS.

Minimum lot size associated with the property	Threshold for clearing, above which the BAM and offsets scheme apply
Less than 1 ha	0.25 ha or more
1 ha to less than 40 ha	0.5 ha or more
40 ha to less than 1000 ha	**1 ha or more**
1000 ha or more	2 ha or more

The proposed development area is located on land mapped under the biodiversity values (BV) map. If development within areas on the BV Map does not involve clearing native vegetation (including groundcover, trees and understorey plants) or a prescribed impact (as set out in clause 6.1 of the Biodiversity Conservation Regulation 2017) within the mapped area, the BOS is not applied based on the BV Map.

However, the proponent must also consider other criteria for the BOS:

- whether the area of native vegetation clearing in areas not on the BV Map exceeds the clearing area thresholds as specified in clause 7.2 of the Biodiversity Conservation Regulation 2017
- whether the proposed development or activity is likely to significantly affect threatened species, or ecological communities or their habitats based on the test of significance in section 7.3 of the BC Act.

Division 6.1 of the Biodiversity Conservation Regulations lists the following additional biodiversity impacts to which scheme applies:

> (1) The impacts on biodiversity values of the following actions are prescribed (subject to subclause (2)) as biodiversity impacts to be assessed under the biodiversity offsets scheme:
>
> (a) the impacts of development on the following habitat of threatened species or ecological communities:
>
> (i) karst, caves, crevices, cliffs and other geological features of significance
>
> (ii) rocks
>
> (iii) human made structures
>
> (iv) non-native vegetation

(b) the impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range,

(c) the impacts of development on movement of threatened species that maintains their lifecycle

(d) the impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities (including from subsidence or upsidence resulting from underground mining or other development)

(e) the impacts of wind turbine strike on protected animals

(f) the impacts of vehicle strike on threatened species of animals or on animals that are part of a threatened ecological community.

(2) The additional biodiversity impacts prescribed by this clause:

(a) are prescribed for the purposes of assessment and biodiversity assessment reports under the Act, but are not additional biodiversity impacts for the purposes of calculating the number and class of biodiversity credits that are required under a biodiversity assessment report to be retired to offset the residual impact on biodiversity values of proposed development, proposed clearing of native vegetation or proposed biodiversity certification of land

(b) may be taken into account in the determination of the biodiversity credits required to be retired (or other conservation measures required to be taken) under a planning approval or vegetation clearing approval or under a biodiversity certification of land.

Based on additional species assessment, the BOS is not triggered as no clearing of native vegetation will occur with the area mapped under the biodiversity values map. The project will also not impact any of the prescribed impacts as outlined in clause 6.1 of the Biodiversity Conservation Regulations 2017.

Fisheries Management Act

The development complies with the requirements of the *Fisheries Management Act 1994*, including the aquatic habitat protection and threatened species conservation provisions in Parts 7 and 7A. No Part 2 or 7 Permit is required as the works are authorised under the *Crown Lands Management Act 2016* or by a relevant public authority (not a local government authority ie DPE).

Aboriginal Lands Rights Act

The *Aboriginal Land Rights Act 1983* (ALR Act) introduced land rights for Aboriginal people in New South Wales, allowing the Aboriginal Land Councils constituted under the Act to claim land as compensation for historic dispossession of land and to support the social and economic development of Aboriginal communities. The ALR Act recognises the traditional ownership and occupation of the land by Aboriginal peoples and the

importance of their connection to land. This means the ALR Act recognises the spiritual, social, cultural and economic importance of land to the State's Aboriginal peoples.

The ALR Act also acknowledges that past governments' decisions have progressively reduced the lands set aside for Aboriginal people without compensation.

The purposes of the ALR Act are set out in Section 3:

- To provide land rights for Aboriginal persons in New South Wales
- To provide for representative Aboriginal Land Councils in New South Wales
- To vest land in those Councils
- To provide for the acquisition of land, and the management of land and other assets and investments, by or for those Councils and the allocation of funds to and by those Councils
- To provide for the provision of community benefit schemes by or on behalf of those Councils

The principle of self-determination underpins the ALR Act. Since the introduction of the ALR Act many of the powers within its provisions, and the right to make decisions, have been gradually transferred to Aboriginal Land Councils.

The ALR Act provides a role and responsibility for the relevant Local Aboriginal Land Council (LALC) with respect to Aboriginal culture and heritage. As such, the Broken Hill LALC has been consulted on this proposal.

As identified in Section 4.12.1, a number of unresolved Aboriginal Land Claims exist on the land parcel adjacent to the proposed development, so no further requirements exist.

National Parks and Wildlife Act

The *National Parks and Wildlife Act 1974* (NPW Act), administered by the Office of Environment and Heritage (OEH), is the primary legislation for the protection of some aspects of Aboriginal cultural heritage in New South Wales.

Part 6 of the NPW Act provides specific protection for Aboriginal objects and declared Aboriginal places by establishing offences of harm. A due diligence process has been undertaken as per the Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (DECCW, 2010).

Water Management Act and regulations

The *Water Management Act* 2000 (WM Act) is administered by the DPE -Water. The object of the Water Management Act is the sustainable and integrated management of the state's water for the benefit of both present and future generations. This act will not be triggered, as no water will be required for the proposed works. The works will occur within 40m of a waterway.

The objectives of the *Water Management Act (2000)* are to provide for the sustainable and integrated management of the water sources of NSW for the benefit of both present and future generations. One key aim is to integrate the management of water sources

with the management of other aspects of the environment, including the land, its soil, its native vegetation and its native fauna.

The proposed project is not relevant to this Act as the proposed works will not require water for processing on site. The Water Management (General) Regulation 2011 sets out a number of exemptions in relation to controlled activities. Under Part 3, Division 2, Subdivision 4 and Schedule 5, Part 2 of the regulations, a controlled activity approval is not required if the controlled activity is to be undertaken in accordance with any mining, Crown lands or western lands lease, licence, permit.

Protection of the Environment Operations Act

The object of the *Protection of the Environment Operations Act 1997* is to achieve the protection, restoration and enhancement of the quality of the NSW environment. The Act provides for the issuing of three types of environment protection notices: clean-up, prevention and prohibition notices.

Clean-up notices can be issued to deal with pollution incidents (e.g. a spill of pollutants). Prevention notices can be issued where an activity is being carried out in an environmentally unsatisfactory manner. Clean-up and prevention notices are issued by the regulatory authority for the activity or premises concerned. In emergencies, the EPA can issue a clean-up notice even though it is not the regulatory authority in the circumstances.

An EPA licence under the protection of the *Environment Operations Act 1997*, is required if the quarry extract more than 30,000T per year, making the activity a scheduled activity. In this case no licence is required.

Environmental Protection and Biodiversity Conservation Act

Under the federally administered *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act), actions which are likely to have a significant impact on Matters of National Environmental Significance (MNES) require approval from the Commonwealth Minister for Environment and Heritage. MNES include:

- World Heritage Areas
- RAMSAR Wetlands of International Importance
- nationally listed threatened species and ecological communities
- listed migratory species
- items of national heritage significance
- nuclear actions
- listed threatened species and ecological communities
- the Great Barrier Reef Marine Park
- a water resource, in relation to coal seam gas development and large coal mining development.

Further assessments undertaken as part of this SEE revealed that no matters of national significance will be impacted upon; therefore, no referral under the EPBC Act is required.

2.3 Relevant policies

State Environmental Planning Policy (State and Regional Development) 2011

The aims of this Policy are as follows:

(a) to identify development that is State significant development,

(b) to identify development that is State significant infrastructure and critical State significant infrastructure,

(c) to identify development that is regionally significant development

Subject to section 74 (1) of the Act, in the event of an inconsistency between this Policy and another environmental planning instrument, whether made before or after the commencement of this Policy, this Policy prevails to the extent of the inconsistency.

Schedule 1 (Part 7- Extractive Industries) of the policy lists the following as state significant development:

(1) Development for the purpose of extractive industry that:

(a) extracts more than 500,000 tonnes of extractive materials per year, or

(b) extracts from a total resource (the subject of the development application) of more than 5 million tonnes, or

(c) extracts from an environmentally sensitive area of State significance.

(2) Subclause (1) (c) does not apply to extraction:

(a) by a public authority in maintenance dredging of a tidal waterway, or

(b) in maintenance dredging of oyster lease areas, or adjacent areas, in Wallis Lake.

(3) Development for the purpose of extractive industry related works (including processing plants, water management systems, or facilities for storage, loading or transporting any construction material or waste material) that:

(a) is ancillary to or an modification of another State significant development project, or

(b) has a capital investment value of more than $30 million.

(4) This clause does not apply to development for the purpose of extractive industry or extractive industry related works that is part of a single proposed development if any other part of the development is State significant infrastructure.

(5) This clause does not apply to development specified in Schedule 1 to State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (now repealed).

The project does not exceed impacts to any of the above, so is not considered State Significant Development.

Schedule 7 - Particular designated development

Development for the purposes of:

(a) extractive industries, which meet the requirements for designated development under clause 26 of Schedule 3 to the Environmental Planning and Assessment Regulation 2021.

State Environmental Planning Policy Resources and Energy 2021 (Resources and Energy SEPP)

The State Environmental Planning Policy Resources and Energy 2021 (Resources and Energy SEPP) consolidates and repeals the provisions of the following 2 SEPPs:

1. SEPP (Mining, Petroleum Production and Extractive Industries) 2007 (Mining SEPP)

2. Sydney Regional Environmental Plan No. 9 – Extractive Industries (No 2 – 1995) (Extractive Industries SREP).

The aims of this Chapter 2 are, in recognition of the importance to New South Wales of mining, petroleum production and extractive industries—

(a) to provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State, and

(b) to facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources, and

(c) to promote the development of significant mineral resources, and

(d) to establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of development of mineral, petroleum and extractive material resources, and

(e) to establish a gateway assessment process for certain mining and petroleum (oil and gas) development—

(i) to recognise the importance of agricultural resources, and

(ii) to ensure protection of strategic agricultural land and water resources, and

(iii) to ensure a balanced use of land by potentially competing industries, and

(iv) to provide for the sustainable growth of mining, petroleum and agricultural industries.

The project is not at variance to the objectives and aims of the SEPP.

SEPP Biodiversity and Conservation (2021)

This SEPP contains:

- planning rules and controls for the clearing of native vegetation in NSW on land zoned for urban and environmental purposes that is not linked to a development application
- the land use planning and assessment framework for koala habitat
- provisions which establish a consistent and co-ordinated approach to environmental planning and assessment along the River Murray
- provisions seeking to protect and preserve bushland within public open space zones and reservations
- provisions which aim to prohibit canal estate development
- provisions to support the water quality objectives for the Sydney drinking water catchment
- provisions to protect the environment of the Hawkesbury-Nepean River system
- provisions to manage and improve environmental outcomes for Sydney Harbour and its tributaries
- provisions to manage and promote integrated catchment management policies along the Georges River and its tributaries
- provisions which seek to protect, conserve and manage the World Heritage listed Willandra Lakes property.

Chapters 2 (Vegetation in non-rural areas), and 4 (Koala habitat protection 2021) are

There are no relevant triggers under the SEPP applicable to this project.

2.4 Local environmental plans

The proposed quarry is located within the unincorporated area of north-west New South Wales and, therefore, is not under any local environmental plan (LEP).

2.5 Relevant guidelines

A number of guidelines were consulted during the preparation of this SEE including:

- EIS Guidelines Extractive Industries - Dredging and other Extraction in Riparian Areas – (Department of Urban Affairs and Planning)
- An Environmental Management and Rehabilitation Plan (Department of Conservation and Land Management)
- Guidelines for developments adjoining land and water managed by the Department of Environment, Climate Change and Water (DECC, 2010)
- Agricultural Issues for Extractive Industries Development fact sheet (Department of Primary Industries)
- Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings (NSW Fisheries).

2.6 Zoning

A number of allotments occur adjacent to the proposal area. The proposed licence area is within the Unincorporated Area, Crown waterway known as Umberumberka Creek managed under the *Crown Land Management Act 2016*.

2.7 Summary of approvals

This project will be assessed under Part 4 of the EP&A Act. Table 3 outlines the applicable approval and concurrences required.

Table 3: Approvals required for the project

Act	Provision	Approval/concurrence
Environmental Planning and Assessment Act	Part 4	Development consent in the unincorporated area of NSW
Crown Lands Management Act 2016	Division 5.6	Crown land licence for the flood mitigation quarry

2.8 Determining authority

The determining authority is the DPE, under delegated authority of the Minister for Planning.

3.0 Location

3.1 Site description

The proposed flood mitigation quarry is located in the bed of the Umberumberka Creek, which runs through land that is used for grazing under Western Lands Lease (WLL).

Further details on the site assessment are provided in section 4.9. The vegetation habitat type along the creek channel is Plant Community Type (PCT) 41 River Red Gum open woodland of intermittent watercourses mainly of the arid climate zone vegetation community.

Figure 1: Typical view across Umberumberka sand quarry

3.2 Land system and geology

The land system is known as Nine Mile of the Downs Country. The land system is made up of lower slopes and outwash areas of the Barrier Range which total an area of approximately 1,575 square kilometres. The creeks of the downs and plains are classified as meandering tree-lined creeks, usually dry, with vegetation dominated with River Red Gum (*Eucalyptus camaldulensis*), Acacias and grasses, with soils consisting of sand and pebbles (Cowling, 1995).

The geology of the Barrier Range is known as the Willyama complex, which is characterised by sediments laid down 1800 million years ago. These sediments have subsequently been dominated by complex folding, heat and pressure and more recently erosion (Cowling, 1995).

The proposed site lies within the Murray Basin, one of the four recognised geological provinces of New South Wales. The Murray Basin is almost completely covered by quaternary material. The western part of the basin in New South Wales is characterised by gently undulating dunes and plains with soils of aeolian (windblown) deposits (Cunningham *et al.* 1981). Many of the rocks and minerals found in the region are of considerable interest and economic importance, and geology exerts strong controls on the landscape.

The proposed quarry has no aspect and a slope is not greater than 8% across its length. The elevation across the site is approximately 240m Australian Height Datum (AHD).

3.3 Hydrology and geomorphology

The Umberumberka Creek transports sand from the hills of the surrounding range and deposits them on the flatter ground as the creek water flow decreases in velocity.

Streams in the region have cut steep-sided gorges containing sheltered waterholes through the ranges. Beyond the foot slopes the streams expand as alluvial fans, distributing sediment into sandy flood outs and clay playas (DECC 2008).

Rock-weathering processes have been operating continuously in the region for more than 90 million years and a deep weathered mantle has formed across most of the landscape. Many slopes are mantled by gibber (rounded, silica-rich boulders) derived from the breakdown of silicified sediments (silcrete duricrusts) (DECC 2008).

There are no stream gauges located in Umberumberka Creek and no historic data on length of flow, water quality or quantity. The creek flows on average a few times per year and generally flows subside within 24 hours.

The creek has always accumulated sand in the section relevant to this proposal. The course of the creek has continued to evolve, as vegetation (River Red Gums) in the bed of the creek assist in accumulating sand, therefore, varying flows and alignment of the creek. The bed of the creek consists of 95% sand with some gravel of varying size - from 2cm to 10cm, fallen tree limbs, washout sections, eroded banks and vegetation.

3.4 Soil

Soils in the depositional basin are deep red sands with variable sandy profiles under dunes, and gradational profiles in the sandplains. Most soils have a moderate to high level of calcium carbonate in the profile. Heavy cracking clays in flood outs and on lake beds are often un-vegetated because they contain high levels of gypsum and sometimes salt (DECC 2008).

The soil in the proposed licence area consists of a variable sandy and silty soil containing between approximately 7% clay and fine silt. Once washed (to a clay and fine silt content of 3%) the quality of sand is excellent for its proposed use. Due to the chemical makeup of sand (clay content and chemical structure) its grains are highly unstable and transportable via alluvial (water) and aeolian (wind).

Within the Umberumberka Creek, the main process occurring is alluvial transportation of sand. The soil to be quarried is not known to be contaminated and not in a high-risk category to become an acid sulphate soil, as it does not undergo extended periods of inundation followed by periods of drying.

The soil profile consists of variable horizons of sand and silt 10–75mm thick. The depth to the clay creek base is variable and up to 2.5m deep. Topsoil will not need to be managed differently to sub surface material.

3.5 Climate

The annual average mean minimum temperature recorded from the Umberumberka Reservoir (site number: 047039) is 13.6ºC, monthly values varying from 6.9ºC during July to 20.1ºC during February. The annual average maximum temperature is 24 deg C - monthly values vary from 14.8ºC in July to 32.2ºC in January (Bureau of Meteorology, 2022).

The annual average rainfall total of 206.3mm is evenly distributed throughout the year but is more concentrated in the summer and autumn months. The month of November is on average the wettest, receiving 21.2mm (see Table 4). By contrast, the year's driest month, October, receiving only 13.2mm (Bureau of Meteorology, 2022).

Table 4: Umberumberka Reservoir temperature and rainfall data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean maximum temperature (°C)	32.2	31.9	28.7	23.3	19.0	15.3	14.8	17.4	21.1	25.0	28.4	31.0
Mean minimum temperature (°C)	19.6	20.1	17.3	13.6	10.5	7.8	6.9	8.1	10.8	13.6	16.4	18.9
Mean monthly rainfall (mm)	20.5	18.0	15.2	13.2	19.1	16.5	15.5	14.7	17.1	19.3	21.2	19.9
Highest monthly rainfall (mm)	171.8	87.9	114.0	142.2	90.8	109.0	62.0	47.0	91.7	96.2	183.4	111.1
Lowest monthly rainfall (mm)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Highest daily rain (mm)	70.0	65.6	96.4	56.6	46.7	55.4	30.4	34.5	59.4	50.4	179.3	51.1

4.0 Environmental impacts and management

Consolidated Mining and Civil (CMC) Pty Ltd are to extract the sand from the flood mitigation quarry. CMC has been operating from various locations around New South Wales for almost 100 years. In that time the company has had minimal impact on the environment by undertaking various management activities. The company is also familiar with the requirements for compliance with relevant legislation and for ensuring implementation of the environmental safeguards deemed necessary to avoid and minimise impacts.

4.1 Natural resource use

The natural resource to be won is high quality construction sand. The adjacent quarry as shown that with further processing (washing in Broken Hill) can provide high quality cement sand to the mining and construction industry.

The quarrying and transporting of the sand will utilise existing tracks and impacts on vegetation will be minimised where possible.

4.1.1 Mitigation measures

- quarrying site to be marked out using permanent markers
- supervision of earthworks will be undertaken by a suitably qualified/experienced mines manager as per company policy
- staff trained in best practice management in all areas of sand quarrying
- no refuelling within 40m of the waterway
- staff should be trained in firefighting techniques in the event of a bushfire, or fire on plant or equipment
- compliance with the Environmental Management and Rehabilitation Plan (EM&R Plan).

4.2 Hydrology and geomorphology

Similar sand extraction in this and nearby creeks has been undertaken under licence by Consolidated Mining and Civil for many years. There will be no impact on surface flows to the creek as a result of this project.

The morphology of a stream channel is the result of the processes of erosion and deposition operating both locally to produce scour and fill, and more generally, within the catchment to define longer-term channel evolution (Sear, 1996).
The sustainability of a particular channel form can be defined (in basic terms) in relation to the balance between sediment supply, transport and storage:

- if sediment supply from upstream catchment > sediment transport through the reach = sediment storage and channel aggradation
- if sediment supply from upstream catchment < sediment transport through the reach = sediment scour and channel degradation.

The site assessment indicates the supply of sediment to the reach proposed for quarrying is located in an area that exceeds the transport capacity, leading to significant

sediment deposition or 'sand slug.' This sand slug has led to floodwater leaving the Umberumberka Creek and traversing the Silverton Road to the south.
Various aerial views of the subject reach are presented in Figures 3 to 6. The aerial images provide an overview of the geomorphic form of the Umberumberka Creek and its tributaries and allow geomorphic processes to be inferred.

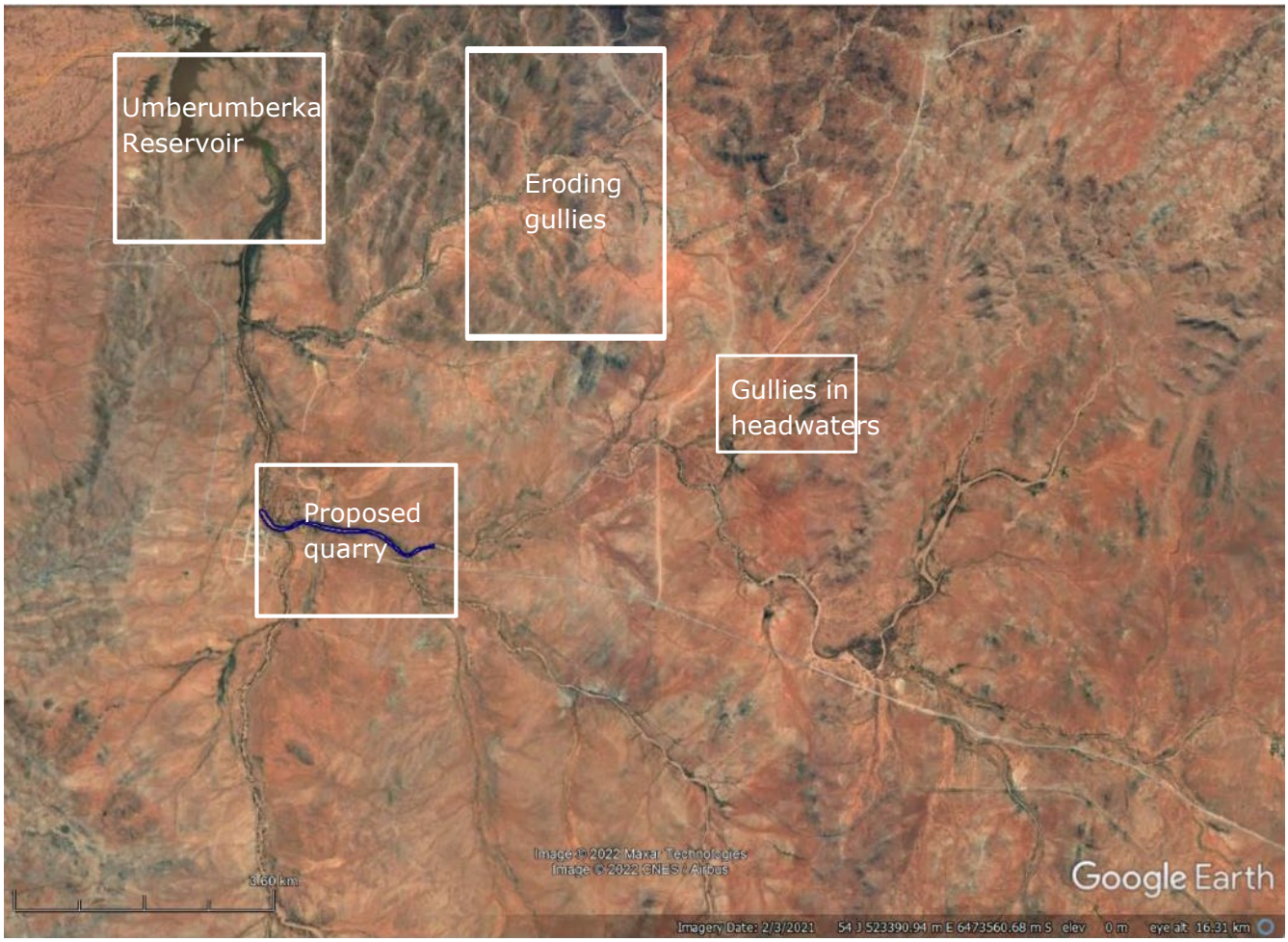

Figure 2: Geomorphoc processes at Umberumberka Creek Catchment

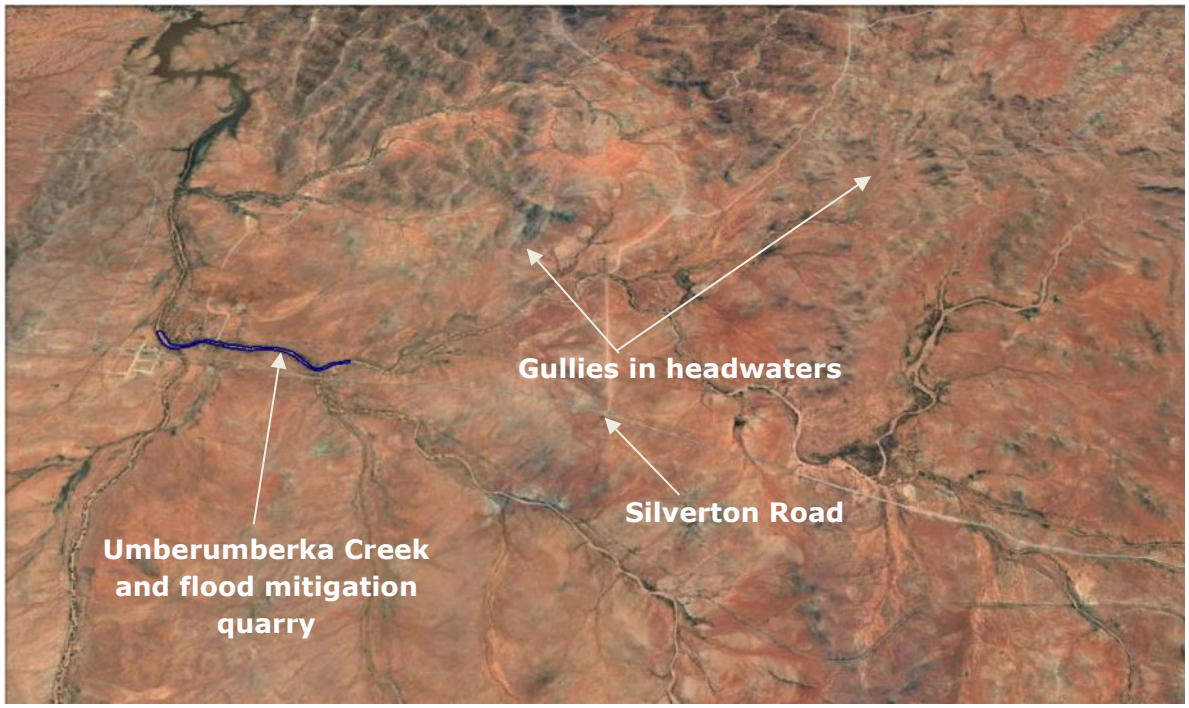

Figure 3: Gullies in headwaters of Umberumberka Creek Catchment

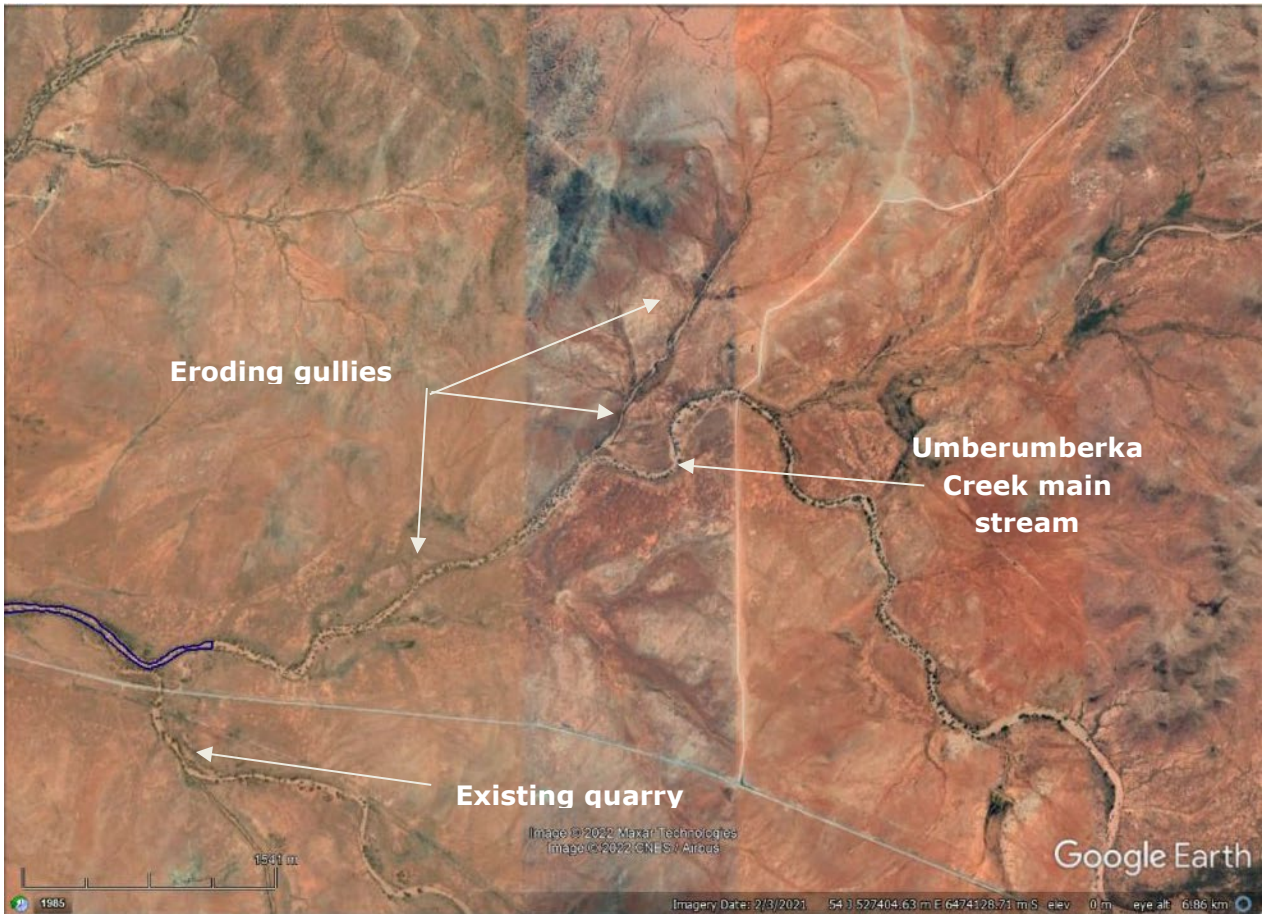

Figure 4: Eroding gullies discharging directly to Umberumberka Creek

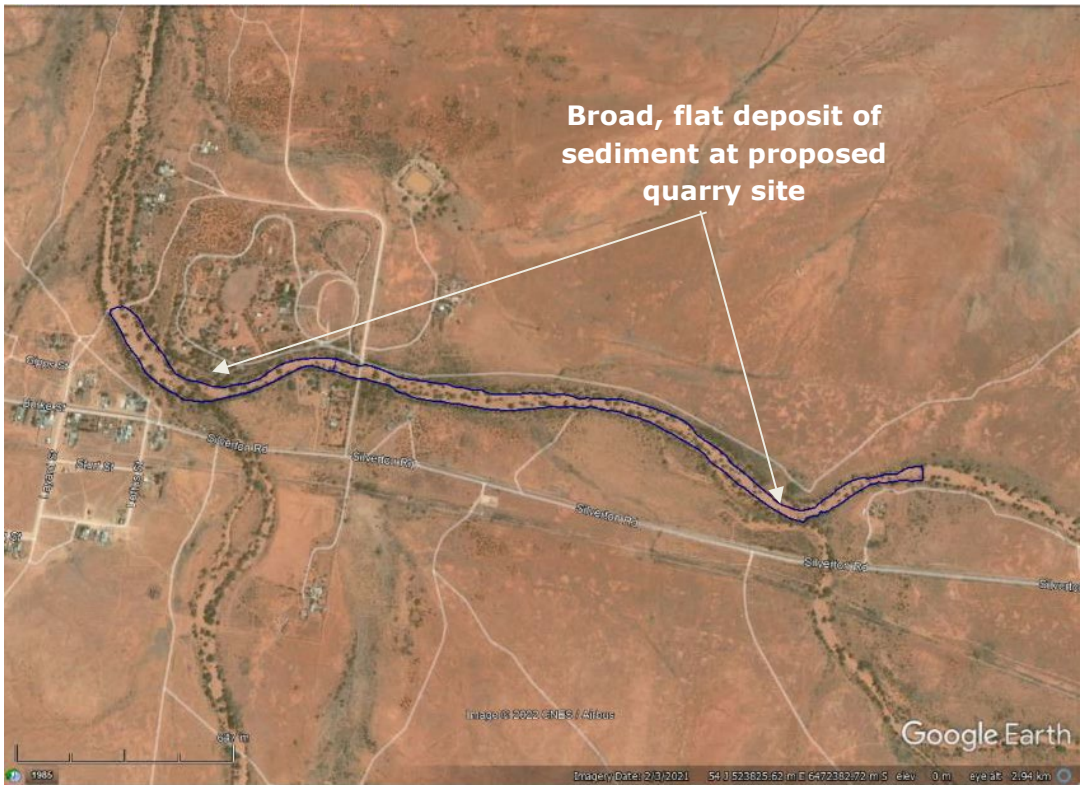

Figure 5: Aerial image of proposed quarry site

The assessment revealed the following features:

- channel banks are relatively low with shallow bank angle
- there is some mature vegetation on the channel banks
- no significant vegetation, other than River Red Gums are present in the channel
- there is a difference in composition between bed and bank sediment (identified on basis of colour), indicating in channel sediment has been transported from elsewhere to this location
- the sediment deposit appears to be flat and relatively featureless, with minimal (if any) bed diversity.

A range of geomorphic impacts from the in-channel sediment quarrying have been documented at the site, including:

Bank collapse

Bank collapse due to increased bank height following the sand removal has been observed in a number of systems (e.g, Rutherford and Budahazy 1996). Bank collapse can occur through mass failure processes such as cantilever failure, rotational slumping and plane failure. These processes are driven by an imbalance between gravitational forces exerted on the bank and strength of the bank material.

The removal of sand from an instream deposit, below the level that would occur without aggradation processes (i.e the supply of sediment is greater than the amount of material that the system is able to transport), can lead to increases in the height of the channel banks and consequently the forces driving mass failure processes. The instream deposit also forms a restoring pressure on the bank that resists the pressures from soil, hydraulic and other loads. When this restoring material is removed, the bank is exposed

and relies solely on its material strength, reinforced by the binding effect of vegetation, to remain intact. This can be exacerbated by machinery or vehicle loading on the bank during and following the extraction activity.

A slow rate of extraction will allow the bank to batter back and reach a new stable bank angle. Quarrying the area in phases to approximately 400mm will minimise the potential for bank collapse. Not quarrying close to the bank and maintaining the bank batter will, as with the existing quarry will minimise bank scour. Minimising and utilising existing creek access tracks will also minimise impacts on vegetation.

Bank scour and exposure or raw (unvegetated) banks

Riparian vegetation is critical to bank stability in most fluvial systems. It is unknown exactly how important riparian vegetation is in maintaining stable banks in Umberumberka Creek, but previous studies (e.g. Rutherford and Budahazy 1996) found that rapid extraction of sand in the Glenelg River catchment in south-eastern Victoria exposed raw banks before vegetation was able to become established, leading to rapid erosion of sandy benches. The key issue was identified as being the rate at which the sand is removed (Rutherford and Budahazy 1996).

The risk of bank scour of this nature occurring as a result of exposure of raw channel material in Umberumberka Creek is dependent on the relative resistance of bank sediments to being eroded and the role of vegetation in controlling bank erosion. Riparian vegetation is present along the majority of the bank, which will protect the bank from bank scour.

Upstream and downstream bed erosion

In most streams, the major concern with sediment extraction is upstream and downstream bed degradation driven by the headward progression of a knickpoint from the extraction hole, as the sediment transport rate into the hole increases.

Deposition of sediment in the hole will lead to a reduction in supply to the reach downstream of the hole and clearwater erosion downstream of the bed (Pickup 1977; Galay 1983). However, much of the post-extraction erosion observed in Australian streams is in 'natural' systems that do not have excessive instream sediment deposition; (Rutherford and Budahazy 1996) concluded that extraction of sediment from systems with sand slugs is likely to lead to erosion of the deposited material but not the underlying clay substrate unless there has been a significant change in the hydrologic regime in the catchment.

It is assumed that the hydrologic regime in Umberumberka Creek has not been altered by activities such as vegetation clearance, gullying or regulation (other than since European settlement), but provided it is comparable to the regime that existed before large-scale sediment deposition occurred, it is unlikely that large-scale bed erosion will occur.

4.2.1 Mitigation measures

- quarrying extent to be marked using permanent markers indicating 'no go zones'
- undertake a slow extraction rate across the site (400mm), rather than quarry each area down to the clay bed in one action

- quarrying to cease 1m from the bank, and a 1:3 batter developed
- supervision of earthworks will be undertaken by a suitably qualified/experienced mines manager as per company policies
- staff trained in best practice management in all areas of sand quarrying
- maintain existing creek access and, where required, in consultation with local fisheries officers, install crushed rock
- compliance with the Environmental Management and Rehabilitation Plan (EM&R Plan).

4.3 Floodplain and riparian habitat

As the proposal is to quarry sand from the bed of Umberumberka Creek, the floodplain is not expected to be impacted upon directly. The indirect impacts will occur in stockpiling area on previously disturbed land. Silt traps will be installed between the creek and the sand stockpile to minimise sand smothering floodplain vegetation (if required).

Existing tracks and road network will be utilised to transport the sand between the quarry area and the depot for processing. Creek sand will be spread on the track to inhibit the clay soil turning to a fine dust with increased traffic. All impacts are expected to be low.
Impacts on the riparian habitat will be minimised by only quarrying down to the bed of the creek and not quarrying within the drip line of the vegetation. Depth of quarrying will vary, and will generally be down to the underlying clay base. By using a minimal number of existing access points to the creek, impacts of riparian habitat will be further reduced.

4.3.1 Mitigation measures

- quarrying extent to be marked using permanent markers
- supervision of earthworks will be undertaken by a suitably qualified/experienced mines manager as per company policy
- staff trained in best practice management in all areas of sand quarrying
- no quarrying to occur within the drip line of trees
- riparian vegetation not to be disturbed
- maintenance of creek sand on access tracks
- no refuelling within 40m of the waterway
- compliance with the Environmental Management and Rehabilitation Plan (EM & R Plan).

4.4 Erosion and sedimentation

The proposed location is suitable as the processes of erosion and sedimentation have already occurred. Weathering and erosion has occurred in the higher rocky ranges and these sediments have been deposited in the proposed area.

The proposal has the potential to cause erosion of the creek bank and of the access track on the floodplain. The creek bank contains areas where natural erosion has occurred but the majority of the bank is in a stable, vegetated state (refer to Appendix E). To minimise erosion of the creek bank, vegetation will not be disturbed during quarrying activities and only one access point will be used to enter/exit the quarry area. The

stockpile area will have a silt trap installed to minimise the risk of quarried sand being washed or blown back into the Umberumberka Creek.

The existing access tracks will be maintained by spreading sand over the clay soil to protect the clay soils from turning to dust.

4.4.1 Mitigation measures

- Quarrying extent to be marked using permanent markers indicating 'no go zones'
- temporary sediment control structures must be maintained at all times during extraction and checked, repaired, replaced or cleaned out after any significant rainfall event
- maintenance of creek sand on access tracks
- compliance with the Environmental Management and Rehabilitation Plan (EM & R Plan).

4.5 Surface water

The proposed quarry will be located in the intermittent Umberumberka Creek. Work will not occur when there is water in the creek and at no time will flow be impeded in the creek. There will be no alterations to the natural flow regimes through this project as shown through similar quarrying of other nearby creeks in the region. Water only flows after approximately 40mm of rainfall across the catchment. The creek historically only flows a few times each year and the water transfers downstream within 24 hours.

As Umberumberka Creek is not a managed waterway, there are no water management plans in place. No monitoring of water quality or quantity occurs due to the low frequency of flow events.

There is no data on the quality and quantity of the surface water in the Umberumberka Creek, but it is expected to vary as it does in any waterway. The nearest fresh water is located at Umberumberka Reservoir, 8km north and Stephens Reservoir, approximately 29km east from the proposed development site. The proposed quarry area will not require any water at the extraction site. Water will only be used for processing in Broken Hill, water entering and stored at Umberumberka is not used.

No stockpiling will occur in the creek, that will impede flows and create erosion potential upstream. The proposal will not change the flooding regime in the creek but will mitigate flooding on the township of Silverton. Flooding is dependent on heavy rainfall in the upper catchment area flowing down the creek. The runoff patterns will not change as the floodplain area will not be impacted upon.

The proposal will not have any impact on Ramsar listed wetlands.

No hazardous materials will be stored on-site, and no sewerage facilities will be established on-site that could impact on surface water flows should they occur.
Most plant and equipment will be re-fuelled either at the proponent's depot, off-site, or at another designated location. Contingency plans would be developed to deal with any spills that may occur. Machinery will be checked daily to ensure there are no leakages of oil, fuel or other liquids.

4.5.1 Mitigation measures

- no stockpiling in the creek that will impede flows
- access tracks will have adequate cut-off drains
- fish passage will not be blocked at any time
- the licence holder will contact the EPA on 131 555 in the event of any chemical or hydrocarbon spills that may impact on the Umberumberka Creek
- daily machinery checks will be made for leaks of oil, fuel or other liquids
- contingency plans will be in place to deal with spills
- no refuelling within 40m of the waterway
- all vehicles to be serviced off-site
- staff inducted on refuelling procedures
- the extractive industry licence holder will ensure that no machinery, fuels, oils, chemicals, hazardous substances or other extraction equipment will be stored within the stockpile area when not in use
- compliance with the Environmental Management and Rehabilitation Plan (EM&R Plan).

4.6 Groundwater

Groundwater resources within the area are generally of varying quality (refer to Table 5) and variable yield (mostly low) (Department of Environment, Water and Heritage website 2009).

No known karst systems occur in the proposed quarry area.

The groundwater in this region is used for stock watering, where the quality allows. Due to the shallow depth of the quarry, the extraction process will not interfere with groundwater.

A search of the New South Wales Groundwater Database identified eight wells within a 10km radius (NSW Natural Resources Atlas). The nearest well lies approximately 2,000m from the proposed site.

An integrity assessment of the data provided for these wells highlighted concerns about the quality of data on all wells. Very little data could be located in relation to depth to water table, screening details or water quality. Table 5 provides an overview of the wells.

Table 5: Groundwater bore data

Number	Distance to site	Depth (m)	Standing water level (m)	Salinity
GW060069	0.32 km	19	Unknown	Unknown
GW060068	0.46 km	26	Unknown	Unknown
GW010135	1.84 km	22.9	Unknown	Unknown
GW009790	4.75 km	29.9	Unknown	Unknown

GW004297	7.00 km	Unknown	Unknown	Unknown
GW500290	7.15 km	10	Unknown	Unknown
GW010244	7.21 km	15.2	Unknown	Unknown

The nearest groundwater wells are between 300m and 500m from the proposed sand quarry. These wells have been drilled to 19m (GW060069) and 26m (GW060068). The standing water level or depth below surface is not available. Based on the depth of the wells drilled in the area, it is expected that groundwater is at least 10m below ground surface and the quality variable. The elevation of these wells is not known.

There will be no impacts on groundwater as the depth of quarrying will be to a maximum of 2.0m, and this has been shown through previous quarrying.

The groundwater is expected to be of poor quality and highly saline. The landholder does not use groundwater for any purposes.

4.6.1 Mitigation measures

- daily pre-start machinery checks for leaks of oil, fuel or other liquids
- contingency plans will be in place to deal with spills, adhering to relevant Australian Standards and Guidelines and conforming to leading practice
- the licence holder will ensure that no machinery, fuels, oils, chemicals, hazardous substances or other quarrying equipment will be stored within the extraction site when not in use
- staff inducted on refuelling procedures, which will be stored with refuelling equipment
- compliance with the Environmental Management and Rehabilitation Plan (EM & R Plan).

4.7 Soils

The majority of the proposed licence area has been disturbed by livestock grazing and rabbits. The material to be won consists of continuous layers of sand, clay and fine silt (7% approx.). The sand will be excavated and stockpiled as required, with processing (washing) occurring off-site.

The soil will be managed to ensure that the creek is not blocked at any time to allow for in-stream flows to continue down the creek, only stockpiling the required amount of material at any given time (1,500t), installing silt traps between the stockpiled area and the Umberumberka Creek. Existing soil to be retained on site will be free from contamination through regularly servicing machinery off site, adhering to the proponent's refuelling policy and ensuring a spill kit is on site at all times.

The depth of quarrying will no be beyond the clay layer in the bed of the creek, which will be defined on site during operations. Historical quarrying shows this various along the creek.

The proposed site is not located within or near any World Heritage properties and would therefore not have any impact on any World Heritage property. The nearest World Heritage Area is Willandra Lakes, located approximately 250km to the south-east of the proposed quarry area.

4.7.1 Contamination

The existing soil is not known to be contaminated and no new contamination is expected as a result of undertaking the proposed quarrying activity.

4.7.2 Acid sulphate soils

There are no areas that are subjected to periods of sustained inundation followed by drying which can lead to the production of acid sulphate soils. When potential acid sulphate soils are disturbed or exposed to oxygen, the iron sulfides are oxidised to sulfuric acid and the soil becomes strongly acidic (usually below pH 4). These soils are then called actual acid sulfate soils and they have a pH of less than 4.0 (Department of Environmental Resources Management, 2009).

4.7.3 Mitigation measures

- no quarrying beyond the clay layer in the bed of the creek
- staff to be trained in best practice management in soil conservation and management
- staff inducted on refuelling procedures, which will be stored with refuelling equipment
- a spill kit will be permanently attached to the bunded fuel storage on site during crushing campaigns
- all machinery to be serviced off site
- supervision of earthworks will be undertaken by a suitably qualified/experienced mines manager as per state requirements
- sand will only be quarried and used as required
- quarrying will only occur during suitable conditions e.g not on days of rain, high wind or flooding.

4.8 Matters of National Environmental Significance

An Environmental Protection and Biodiversity Conservation (EPBC) Act Protected Matters Search Tool report was generated (on 26 August 2022) for the study area on a 10km buffer. The report indicated:

- no World Heritage Areas near the proposed site
- no items of National Heritage Places near the proposed site
- the study site is located upstream from three wetlands of international importance
- no Commonwealth Marine areas near the proposed site
- potential for two threatened ecological communities to exist within the proposed site
- potential for 14 threatened species to occur in the vicinity of the proposed site

- potential for eight migratory species to occur within the vicinity of the proposed site.

Further assessments undertaken as part of this project revealed that no matters of national significance will be impacted upon, therefore no referral under the EPBC Act is required.

4.9 Flora

4.9.1 Bioregion and PCT type

The proposed quarry site is located in the Broken Hill Bioregion Complex, covering an area of 5,691,042ha across New South Wales and South Australia. The Broken Hill Complex Bioregion in western New South Wales is geologically unique in the state. The western half is composed of ancient basement rocks of the Adelaide Fold Belt, and the eastern half is the edge of the much younger rocks of the Tasman Fold Belt. Many of the rocks and minerals found in the region are of considerable interest and economic importance, and geology exerts strong controls on the landscape (Cowling, 1995).

The New South Wales plant community type (PCT) classification was developed in 2011 to establish an unambiguous master community-level classification for use in vegetation mapping programs, biometric-based regulatory decisions, and as a standard typology for other planning and data gathering programs. The biometric vegetation type by catchment management authority region descriptions were used to classify the vegetation on site.

River Red Gum open woodland

The area proposed to be quarried is classed as *River Red Gum open woodland of intermittent watercourses mainly of the arid climate* (PCT 41). This vegetation community consists of open woodland to about 15m tall, composed of the arid zone sub-species of River Red Gum (*Eucalyptus camaldulensis* subsp. arida) sometimes with Coolabah (*Eucalyptus coolabah*) in northern areas. The understorey shrub layer is sparse and includes, River Cooba (*Acacia salicina*), (*Acacia stenophylla*), Western Boobialla (*Myoporum montanum*), Thorny Saltbush (*Rhagodia spinescens*), Prickly Wattle (*Acacia victoriae*), Emubush (*Eremophila longifolia*) and *Senna* form taxon *artemisioides*. Chenopod shrubs such as Black Bluebush (*Maireana pyramidata*) and Bladder Saltbush (*Atriplex vesicaria*) may occur on the edge of this community. Ground species include the small shrubs such as *Enchylaena tomentosa*, and *Salsola kali var. kali*; grasses such as *Enneapogon avenaceus, Cymbopogon ambiguus, Eragrostis dielsii, Aristida echinata* and *Aristida contorta*; forbs include *Tetragonia eremaea, Nicotiana velutina, Pterocaulon spacelatum, Daucus glochidiatus, Einadia nutans subsp. linifolia, Ptilotus obovatus, Ptilotus atriplicifolius var. atriplicifolius* and various daisies.

Occurs on sandy or loamy soils in sandy creeks on sandplains of lower slopes of rises or hills in the arid climate zone of far north western NSW in the Broken Hill Complex, Simpson-Strzlecki Dunefields, western Mulga Lands and Channel Country Bioregions. The trees are more spaced and shorter and the ground cover more sparse than in the River Red Gum communities in wetter climes. This community is moderately well represented in protected areas and not threatened by clearing but may be threatened in some areas

if flooding regimes change. Overgrazing by stock and feral animals along with some local weed infestations remain the major threats this community.

Bluebush shrubland

The area from which the site would be accessed and the stockpile areas (existing cleared areas) is classed as *Bluebush shrubland on stony rises and downs in the arid and semi-arid zones* (PCT 155).

Mid-high open shrubland dominated several species of bluebushes but mainly Black Bluebush (*Maireana pyramidata*) with Pearl Bluebush (*Maireana sedifolia*) occurring in more calcareous sites. Other shrubs include Thorny Saltbush (*Rhagodia spinescens*), Low Bluebush (*Maireana astrotricha*) and Bladder Saltbush (*Atriplex vesicaria sens lat*).

The proposed project will utilise an existing stockpile area and access to the creek bed will be via the existing access track. No indirect impacts associated with this activity are expected.

Within the quarrying area, little impact is expected. No stripping will occur within the dripline of trees. The stripping of sand layers over time, leaving a 1:3 batter on the creek walls, maintains wall integrity. The indirect impacts such as noise and dust are limited by the fact that the material is not fine-grained soil (minimising potential to be blown away) and the activity will occur in a creek bed which is lower in the landscape, effectively trapping noise in the landscape.

The flora assessment revealed no vegetation species; population or communities, which are of local, regional or state conservation significance (refer to Appendix C).

4.9.2 Threatened species

A database search was undertaken on 26 August 2022 of the Department of Planning and Environment (DPE), Energy and Science (BioNet Atlas of NSW Wildlife) and the Department of Climate Change, the Environment, Energy and Water (DCCEEW) websites to identify threatened species that may be found within the proposed quarrying sites as listed under the BC Act and the EPBC Act.

A desktop search of the online databases was undertaken as follows:

- DPE, Energy and Science BioNet Atlas of NSW Wildlife (refer to Appendix B)
- DCCEEW, Environmental Protection and Biodiversity Conservation (EPBC) Protected Matters Report (refer to Appendix B).

Four threatened flora species were identified within the study area plus 10km. Table 7 identifies these species, their threat level, predicted occurrence and a comment on potential to occur on site. One of these species (Slender Darling-pea) has potential to occur at the site so is subject to the 'test of significance', as set out in Section 7.3 of the BC Act (Appendix C).

Table 6: Threatened flora predicted

Common name	Species name	State	National	Occurrence	Comment
Purple-wood Wattle	*Acacia carneorum*	Vulnerable	Vulnerable	Species or species habitat known to occur within area	Not observed in the study area. *Acacia carneorum* grows in grassland and woodland in red, sandy soil; also found in Mulga communities on sand dunes, level sandy sites and alluvial accumulations along watercourses; recorded from inland semi-arid Acacia and Casuarina shrublands and woodlands. Preferred soils are shallow, calcareous and loamy, and include brown earths, crusty alkaline soils and neutral red duplex soils; confined to red-earth dune soils in Kinchega NP as a dominant or occasionally co-dominant, usually on dune crests or slopes.
	Frankenia plicata		Endangered	Species or species habitat likely to occur within area	Not observed in the study area. *Frankenia plicata* grows in a range of habitats, including on small hillside channels, which take the first run-off after rain. In the Simpson Desert, the species has been found predominantly from swales of loamy sands to clay. This species is found in a wide range of vegetation communities that have good. This species occurs within the South Australian Arid Lands Natural Resource Management Region.
Desert Greenhood	*Pterostylis xerophila*		Vulnerable	Species or species habitat may occur within area	Unlikely habitat, found further east at high altitudes.
Slender Darling-pea	*Swainsona murrayana*	Vulnerable	Vulnerable	Species or species habitat likely to occur within area	Potential habitat. *Swainsona murrayana* grows in a variety of vegetation types including bladder saltbush, black box and grassland communities on level plains, floodplains and depressions and is often found with *Maireana* species. Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated. Slender Darling-pea has been collected from clay-based soils, ranging from grey, red and brown cracking clays to red-brown earths and loams and has been known to occur in paddocks that have been moderately grazed or occasionally cultivated

4.9.3 Threatened communities

The above-mentioned databases were also searched for threatened communities. Two threatened communities were listed through the database searches, including:

- *Acacia loderi* shrublands
- Porcupine Grass—Red Mallee—Gum Coolabah hummock grassland/low sparse woodland in the Broken Hill Complex Bioregion

None of these communities were observed onsite.

4.9.4 Flora site assessment

A general flora assessment was conducted across the proposed area by Chris Alderton (B. Applied Science), including the surrounding area on 19 January 2022. Weather conditions included clear sky, a maximum temperate of 18ºC and winds from the north-west of approximately 10km/h. The half day assessment, adhering to Table 5.1 Survey effort (DEC, 2004) focused on areas of likely higher vegetation values and active searches of likely habitat for reptiles and hollow bearing trees.

According to the DEC field survey methods (DEC, 2004), the study area was random stratified based on vegetation type, aerial imagery information and the site assessment. The survey method undertaken is described as a stratified ramble assessment, where the whole site was assessed, with particular focus on areas of higher quality habitat. Two Plant Community Type (PCT) occur within the study site. The stratification units included (refer to Appendix A):

- the creek, bed and banks (PCT 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone)
- the floodplain area proposed for access (PCT 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones)
- upstream and downstream of the proposed quarry area (PCT 41)

The study area does form part of a corridor and has high connectivity value along the creek. Some hollow bearing trees were observed within the study area. The vegetation condition on site was observed as 'not low' according to DEC (2004).

The habitat assessment was undertaken as per the Draft DEC guidelines (DEC, 2004) where a comprehensive habitat assessment was undertaken across the whole site, identifying key habitat features for both flora and fauna. The features of the study area included:

- the Umberumberka Creek and tall eucalypt vegetation
- sandy sediments in the base of the creek
- floodplain vegetation containing low chenopod shrubland.

The flora assessment revealed no vegetation species; populations or communities, which are of local, regional or state conservation significance (refer to Table 7).

No native vegetation will be impacted by this proposal, it has been designed to avoid all native vegetation by using the existing creek access.

Table 7: Flora species recorded on-site

Scientific name	Common name	Thr/Status
Acacia victoriae	Prickly acacia	No
Astrostipa sp.	Spear grass	No
Atriplex nummularia	Old man saltbush	No
Atriplex vecicaria	Bladder saltbush	No
Chamaesyce drummondii	Caustic weed	No
Chloris truncate	Windmill grass	No
Enchylaena tomentosa	Ruby saltbush	No
Eucalyptus camaldulensis	River red gum	No
Exocarpus aphyllus	Leafless ballart	No
Maireana brevifolia	Yanga bush	No
Maireana prymidata	Black bluebush	No
Maireana sedifolia	Pearl bluebush	No
Medicargo minima	Wooly burr medic	No
Myoporum montanum	Western boobialla	No
Rhagodia spinescens	Thorny saltbush	No
Sclerolaena decurrens	Green copperburr	No
Sclerolaena diacantha	Grey copperburr	No

Sencio sp.	Shrubby groundsel	No
Vittadinia cuneata	Fuzzweed	No
* *Asphodelus fistulosus*	Onion weed	No
* *Carrichtera annua*	Wards weed	No
* *Salvia verbenaca*	Wild sage	No

# Denotes introduced species

4.9.5 Mitigation measures

- Use existing creek accesses
- to ensure the stability and health of instream River Red Gum trees, there will be no quarrying in the drip line of these trees
- to protect the bank from scour, quarrying will not occur close to the bank to ensure it remain stable
- Environmental Management and Rehabilitation Plan (EM&RP) will be followed at all times.

4.10 Fauna

4.10.1 Threatened species

A database search was undertaken on 26 August 2022 of the DPE, Energy and Science (BioNet Atlas of NSW Wildlife) and the DCCEEW websites to identify threatened species that may be found within the proposed quarrying site as listed under the BC Act and the EPBC Act.

A desktop search of the online databases was undertaken as follows:

- DPE, Energy and Science BioNet Atlas of NSW Wildlife (refer to Appendix B)
- DCCEEW, Environmental Protection and Biodiversity Conservation (EPBC) Protected Matters Report (refer to Appendix B).

None of these species were recorded during site assessments on 19 January 2022.

Table 8 lists the fauna species with state and national conservation significance that have the potential to occur within the study area. The column in Table 8 headed 'comment', identifies the suitability of the site for the particular species, such as for habitat utilisation, nesting/burrowing requirements, food and water requirements and the vegetation type preferred by the species. One of those species, Ringed Brown Snake has 'potential habitat' so are subject to 'test of significance', as set out in Section 7.3 of the BC Act (Appendix C).

None of these species require further assessment.

Table 8: Listed fauna species

Class	Common name	Species name	State	National	Occurrence	Comment
Ave	Plains-wanderer	*Pedionomus torquatus*		Critically Endangered	In feature area	Unlikely habitat, Plains-wanderers live in semi-arid, lowland native grasslands that typically occur on hard red-brown soils. These grasslands support a high diversity of plant species, including a number of state and nationally threatened species
Ave	Curlew Sandpiper	*Calidris ferruginea*		Critically Endangered	In feature area	No habitat, it generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts.
Ave	Night Parrot	*Pezoporus occidentalis*		Endangered	In feature area	No habitat. The Night Parrot is known to occur within Spinifex grasslands in stony or sandy areas and samphire and chenopod associations on floodplains, salt lakes and clay pans. Suitable habitat is characterized by the presence of large and dense clumps of Spinifex, and it may prefer mature spinifex that is long and unburnt.
Ave	Australian Painted Snipe	*Rostratula australis*		Endangered	In feature area	No habitat, prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber.
Ave	Thick-billed Grasswren	*Amytornis modestus*		Vulnerable	In feature area	No habit to be impacted. Thick-billed Grasswren that occur in chenopod shublands in southern arid Australia
Ave	Painted Honeyeater	*Grantiella picta*		Vulnerable	In feature area	No habitat. Inhabits Boree/ Weeping Myall (Acacia pendula), Brigalow (A. harpophylla) and Box-Gum Woodlands and Box-Ironbark Forests.
Ave	Rufous Fieldwren	*Calamanthus campestris*		Vulnerable		No habitat to be impacted. Rufous Fieldwren lives on the ground in low, sparse or dense chenopod shrublands, samphire and heathland in arid southern Australia
Ave	Grey Falcon	*Falco hypoleucos*		Vulnerable	In feature area	No habitat to be impacted. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast.

Fish	Murray Cod	*Maccullochella peelii*		Vulnerable	In buffer area only	No habitat, requires permanent water
Mammal	Corben's Long-eared Bat, South-eastern Long-eared Bat	*Nyctophilus corbeni*		Vulnerable	In buffer area only	No habitat to be impacted. Inhabits a variety of vegetation types, including mallee, bulloke *Allocasuarina leuhmanni* and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland
Mammal	Plains Rat, Palyoora, Plains Mouse	*Pseudomys australis*		Vulnerable	In feature area	No habitat. The Plains Rat is primarily found in gibber (stone-covered) plains and mid slopes with boulders, small stones and gilgais (water soaks, depressions). In years of very good rainfall, this species occur on adjoining sandy plains. During poor conditions, core refuge areas may occur on low-lying gilgais and watercourses of gibbber plains
Mammal	Dusky Hopping-mouse, Wilkiniti	*Notomys fuscus*		Vulnerable	In feature area	No habitat to be impacted. The southern-most record in NSW was from the Broken Hill Complex Bioregion, and collected in Bluebush (Maireana pyramidata) chenopod shrubland near a drainage line with River Red Gums (Eucalyptus camaldulensis), Prickly Wattle (Acacia victoriae) and Western Boobiala (Myoporum montanum).
Reptile	Barrier Range Dragon	*Ctenophorus mirrityana*	Endangered			No habitat. Restricted to rock outcrops in ranges and gorges. It is absent from apparently suitable habitat in NSW.
Reptile	Ringed Brown Snake	*Pseudonaja modesta*	Endangered			Potential habitat. A terrestrial species that inhabits drier areas including rocky outcrops and dry watercourses.

#Denotes introduced species

4.10.2 Fauna site assessment

A general fauna assessment was conducted across the proposed area by Chris Alderton 19 January 2022. The assessment also focused on the access to the site and surrounding habitat.

The fauna assessment revealed no species; population or communities, which are of local, regional or state conservation significance (refer to Table 9).

Table 9: Fauna species recorded on site

Scientific name	Common name	Thr/Status
Osphranter rufus	Red Kangaroos	Common
Eolophus roseicapillus	Galah	Common
Struthidea cinerea	Apostle birds	Common
Gymnorhina tibicen	Magpie	Common
Dromaius novaehollandiae	Emu	Common
#Camelus sp	Camel	Common, introduced

#Denotes introduced species

4.10.3 Assessment of significance

An assessment of significance (refer to Appendix C) was conducted for:

- Slender Darling-pea (*Swainsona murrayana*)
- Ringed Brown Snake (*Pseudonaja modesta*)

The assessment revealed that the potential impacts of the proposed quarry on the the Slender Darling pea and Ringed Brown Snake are extremely unlikely and where there could be potential impacts, they will be very low. Potential minor impacts are not expected to increase the likelihood of a threatened or endangered species from becoming extinct, due to the construction or operation of the proposed quarry.

The assessment of significance for these threatened species does not trigger the requirement for a species impact statement (SIS) or EPBC referral to be carried out.

The proposal is deemed to be non-significant for the assessed species. In determining the significance of the proposed quarry on threatened species, the following matters were taken into consideration:

- pre-quarry, quarrying and rehabilitation phases
- all onsite and off-site impacts, including location and operation
- all direct and indirect impacts
- the frequency and duration of each known or likely impact/action
- the total impact which can be attributed to that action over the entire geographic area affected - initially and over time
- the sensitivity of the receiving environment
- the degree of confidence with which the impacts of the action are known and understood.

4.10.4 Mitigation measure

- Use existing creek access
- quarrying areas are to be examined prior to work starting each day to remove any reptiles or other fauna that may be within the work site
- the Environmental Management and Rehabilitation Plan (EM&RP) will be followed at all times
- threatened species information sheets to be available to staff to assist in positive identification of a potential threatened species.

4.11 Weeds and pests

Weed and pest animal assessments were conducted within the proposed sand quarry area on 19 January 2022 by Chris Alderton, recording weed and pest attributes. Three weed species were identified and only one pest (camel) was recorded as present.

4.11.1 Mitigation measures

- All extractive industry processing machinery will be thoroughly cleaned down (with water or compressed air) prior to entering the quarry

- the extractive industry licence area will be monitored regularly for the presence of noxious weeds to avoid spreading weeds in sand transported to other areas of the property
- pests will be controlled within the quarrying area by annually undertaking surveys to assess impacts and undertake control actions
- the Environmental Management and Rehabilitation Plan (EM&RP) will be followed at all times.

4.12 Heritage

4.12.1 Aboriginal heritage

The proposed quarry is within the Determined Native Title Claim areas (NCD2015/001) Barkandji Traditional Owners #8 (Part A).

There are a number of undetermined Aboriginal Lands Claim (ALC) that surround the proposed quarry, these lands will be avoided unless agreement can be reached with the ALC applicants and State Government.

An Aboriginal Heritage Information Management System (AHIMS) database search was undertaken on 1 November 2022 of the proposed quarry and buffer area (refer Appendix D). No Aboriginal objects or Aboriginal places were recorded. Being a built-up area, within close proximity to a township, a AHIMS sites were expected. A contingency plan in the event that cultural heritage material is discovered is provided in Appendix G.

The Broken Hill Local Aboriginal Land Council confirm that an Aboriginal Cultural Sites survey was completed on the 22 March 2023. The survey was conducted by Ricky Menz and Raymond B O'Donnell Snr. The Broken Hill LALC Sites Officers have confirmed that no Aboriginal artefacts were found in the surveyed area (refer Appendix F).

The Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (DECCW, 2010) was reviewed to determine if an Aboriginal Heritage Impact Permit (AHIP) is required. Section 8 of this document provides a flow chart of the due diligence process. It was determined that appropriate due diligence has been undertaken and that an AHIP is not required.

As outlined in the Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW, a number of assessments and tests have been undertaken to ensure no harm is caused to places of Aboriginal significance.

This code sets out the reasonable and practicable steps which individuals and organisations need to take in order to:

1. Identify whether or not Aboriginal objects are, or are likely to be, present in an area
2. Determine whether or not their activities are likely to harm Aboriginal objects (if present)
3. Determine whether an AHIP application is required.

In following the generic due diligence process, the following processes have occurred, including engagement with the Aboriginal Community:

Step 1 – The activity will disturb the ground surface.

Step 2a – a search of the Aboriginal Heritage and Information Management Service (AHIMS) database was completed, with no sites being recorded in the search area.

Step 2b – No other sources of information suggest Aboriginal objects occur within the activity area.

Step 2c - The activity is being undertaken in an area where landscape features do indicate the presence of Aboriginal objects.

Step 3 – Yes, Aboriginal objects listed on AHIMS can be avoided.

Step 4 –A visual inspection was undertaken by a person with expertise in locating and identifying Aboriginal objects, with no objects being recorded in areas proposed to be impacted upon.

Result - proceed with the activity without an Aboriginal Heritage Impact Permit (AHIP) if you have found no evidence of Aboriginal objects using this due diligence code.

4.12.2 Other cultural heritage

The State Heritage Register (NSW Environment and Heritage) database was used to determine if any areas of historic value were located on or nearby the site. There are no other known heritage sites within the proposed quarrying area. This was to be expected due to the remoteness of the proposed quarry and the fact that no visible remnants were discovered during the on-site assessment.

4.12.3 Mitigation measures

- If an unidentified cultural heritage site is discovered during quarrying, work will cease immediately and the Broken Hill office of the National Parks and Wildlife Service will be contacted. Consolidated Mining and Civil Pty Ltd will then wait for further advice.
- A contingency plan in the event that cultural heritage material is discovered is provided in Appendix G.

4.13 Air quality

The nearest residences and receptor to the quarry site are located around 60m from the quarrying sites and the nearest public road is approximately 10m.While relatively close to residence and public roads, there will be no impact from the expected minor raised dust that may occur from time to time during heavy vehicle movements and plant operation, as sand is course not fine. Dust suppression activities will be required during carting and loading activities.

Practices associated with quarrying of sand that could affect air quality include bush fire, exhaust emissions from vehicles and plant and windblown dust during operational periods. To mitigate dust, rock will be applied to access tracks as required to minimise raised dust from transport activities. Dust from the activity is expected to be minimal due to the nature of the material. Where dust becomes an issue, despite the laying of crushed rock, water may be sprayed over the tracks to reduce the impact.

4.13.1 Mitigation measures

- no burning of timber or other combustible materials will occur on-site

- all plant and equipment will be equipped with fire extinguishers
- staff shall be trained in firefighting techniques in the event of a bushfire, or fire on plant or equipment
- all vehicles and plant will be regularly serviced, be in good working order and emissions will be kept within manufacturers standards
- materials transported in trucks will be appropriately covered and contained by tarpaulins
- quarrying/carting operations will cease if severe wind conditions are present.

4.14 Socio and economic

The sand is proposed to be used in the construction industry to make cement. The quarry is required as other local sand resources in the area are limited and would have a larger environmental impact, adding additional expense and greenhouse gas emissions if used. The product creates jobs from is use in the local Broken Hill and Silverton areas.

4.14.1 Economic

The expected cost of the development is approximately $100,000. Additional costs include the maintenance of plant and equipment required for quarrying activities.

The proposal will employ local drivers and operators throughout the life of the quarrying activities. The economic returns to the local economy will be by way of income through employment and development. The flow on effects are important to the wider Broken Hill area.

4.14.2 Social

The proposed quarry will not disadvantage any individuals or communities and consultation with all known affected groups has been undertaken. The quarry may well assist the community through flood mitigation, by removing the build-up of sand with in the Umberumberka Creek.

As required by any construction site in NSW, appropriate signage will be placed around the quarries, including 'trucks turning'; 'PPE' and general safety signs. No safety fencing will be required due to the shallow depth of the quarry.

4.14.3 Impact on the community

Although the character of the area would be slightly affected by the proposal, by minimising the extent of the impact and undertaking rehabilitation, there would be minimal long-term impacts.

4.14.4 Visual impact

The proposed quarry site will have low visual impact relative to the location of the development within the creek, reducing the sand slug back to the creek bed.

4.14.5 Mitigation measures

the Environmental Management and Rehabilitation Plan (EM&RP) will be followed at all times.

4.15 Transport

The proposed quarry will utilise existing tracks to access the quarry area.

A front-end loader, two articulated tip trucks and up to four light vehicles will be required on site. The light vehicles will travel from the company depot in Broken Hill to the quarrying site and back to the company depot at the end of the day. It is expected that up to four staff will travel to the site in the morning and return at the end of the day to the company depot.

Internal parking facilities will be contained on existing public areas, the quarry or disturbed areas.

Sand will be transported from the set down area to the depot for processing in Broken Hill by road train. It is expected that up to two road trains will operate and make up to eight movements each per day.

In negotiation with the NSW Roads and Maritime Service, appropriate signage and intersection treatments will be developed at the existing gravel track and the Silverton Road. The capacity, efficiency and safety of the road network have been assessed and the access track to the stockpile area provides for all of these elements. Sight distances in either direction from the access track is at least 500m and in a town speed zone.

This project will be undertaken with adherence to relevant legislation and best practice management.

4.15.1 Mitigation measures

- staff shall be trained in firefighting techniques in the event of a bushfire, or fire on plant or equipment
- Environmental Management and Rehabilitation Plan (EM&RP) will be adhered to at all times.

4.16 Noise and vibration

The main source of noise may arise from the use of heavy machinery to extract and load sand; and trucks to cart the material from the site to its use location. Considering the distance of the extractive industry licence from the nearest residences (receptor) and the use of existing local roads, no noise or vibrations nuance is expected.

The OEH Interim Construction Noise Guideline (DECC, 2009) details that standard construction working hours are as follows:

- Monday to Friday: 7.00am to 6.00pm
- Saturday: 8.00am to 1.00pm
- Sunday and public holidays: No work

Work undertaken outside of standard working hours would be in accordance with the OEH Interim Construction Noise Guideline (ICNG) (DECC, 2009) and the Construction Noise and Vibration Guideline (CNVG) (RMS, 2016).

Major sources of ground vibration, front end loaders and truck movements during work. Vibrations generated from construction and quarrying activities are expected to be similar in magnitude to those generated from the operation of similar equipment to be used.

Ground vibration impacts at specific levels of magnitude may either:

- disturb occupants of buildings
- disturb contents of buildings by rattling, shaking or movements
- affect structural integrity of a building.

4.16.1 Mitigation measures

- plant and equipment serviced and using manufacturers specified mufflers
- quarrying operations to occur on site (7am-8pm Monday to Sunday)

4.17 Bushfire hazards

Due to the nature of the proposal and the composition of vegetation species at the site, it is highly unlikely that the vegetation would carry a fire. The wide spacing of individual trees (outside the proposed quarrying area) the areas would not be conducive to the spread of fire.

No bushfires are known to have spread through the areas in the last 30years.

4.17.1 Mitigation measures

- no burning of timber or other combustible materials will occur on site
- all plant and equipment will be equipped with fire extinguishers
- staff shall be trained in firefighting techniques in the event of a bushfire, or fire on plant or equipment
- all vehicles and plant will be regularly serviced, be in good working order and emissions to be kept within manufacturers standards
- Environmental Management and Rehabilitation Plan (EM&RP) will be followed at all times.

4.18 Chemical and hazardous substance management

No hazardous substances will be stored on site, other than bulk fuel in a bunded container. Limited hazardous substances will be brought on site, in particular, fuels and lubricants, eg. oil, grease and distillate, as the fuel for heavy equipment will be transported as required on utility, trailer or fuel truck. Best management practices will be followed when these substances are transferred and in use as stipulated by CMC work practices. Empty containers will be taken off the site and suitably disposed of to landfill or recycled.

4.18.1 Mitigation measures

- staff trained in best practice in chemical and hazardous substance management
- all vehicles and machinery to be regularly serviced, be in good working order and emissions to be kept within manufacturers standards
- staff shall be trained in firefighting techniques in the event of a bushfire, or fire on plant or equipment
- all vehicles serviced off-site
- staff inducted on refuelling procedures, which will be stored with refuelling equipment

- in the event of unexpected breakdown of heavy machinery on the site, the spill kit will be used to prevent leakage of petroleum products to the soil - should soil contamination occur, soil will be removed to a licensed facility as per EPA guidelines
- any discarded oils, worn machinery parts, damaged tyres, broken hoses or empty containers will be removed to a waste storage area on the day they are generated.

4.19 Waste minimisation and management

The work site will operate in a tidy, rubbish free state. Any wastes generated will be contained and removed from the site for recycling or safe disposal. No environmental problems are anticipated with the disposal of potential waste.

4.19.1 Mitigation measures

- staff will be trained in best practice in all areas of sand quarrying
- waste storage site to be marked out and known to all employees
- waste at storage site to be removed monthly for processing or safe disposal.

4.20 Cumulative environmental impacts

The cumulative environmental impacts of the proposal will be minimal. As stated throughout Section 4, each identified impact has been assessed for its potential threat to the environment. Mitigation measures will help minimise the impact on the proposed quarrying areas, as well as offsite impacts.

4.21 Summary of mitigation measures

A range of mitigation measures will be put in place to ensure the proposal has minimal impact on the environment, both on site and off site, including:

- all machinery to be serviced off-site
- all plant and equipment will be equipped with fire extinguishers
- staff should be trained in firefighting techniques in the event of a bushfire, or fire on plant or equipment
- all vehicles and machinery to be regularly serviced, be in good working order and emissions to be kept within manufacturers standards
- all vehicles serviced off-site
- All machinery will be thoroughly cleaned down (with water or compressed air) prior to entering the quarry
- any discarded oils, worn machinery parts, damaged tyres, broken hoses or empty containers will be removed to a waste storage area on the day they are generated
- compliance with the Environmental Management and Rehabilitation Plan (EM & R Plan)
- appropriate signage will be installed as required under legislation and adherence with best practice management
- contingency plans will be in place to deal with spills
- a spill kit is permanently attached to the portable fuel cart, which is brought on site each day

- no stockpiling in the creek that will impede flows
- no quarrying beyond the clay layer in the bed of the creek
- Use existing creek access
- daily machinery checks will be made for leaks of oil, fuel or other liquids
- sand will only be quarried and used as required
- haulage roads will be maintained to the proponent's quality standards, allowing efficient and safe operation
- if an unidentified cultural heritage site is discovered during quarrying, work will cease immediately and the NSW Office of Environment and Heritage (Broken Hill) will be contacted - CMC will then wait for further advice
- in the event of unexpected breakdown of heavy machinery on the site, appropriate measures will be put in place to prevent leakage of petroleum products to the soil
- install cut-off drains as required
- install silt fences and erosion control as required
- machinery will be washed down off-site prior to entering the proposed sand quarries, to ensure they are weed free
- maintain current stormwater management plan
- materials transported in trucks will be appropriately covered and contained by tarpaulins as per company policy
- no burning of timber or other combustible materials will occur on-site
- to ensure the stability and health of instream River Red Gum trees, there will be no quarrying in the drip line of these trees
- to protect the bank from scour, quarrying will not occur close to the bank to ensure it remain stable
- pests will be controlled within the quarrying area by annually undertaking surveys by the proponent's weeds officer to assess impacts and undertake control actions
- plant and equipment serviced and using manufacturers specified mufflers
- quarrying and processing will only occur during suitable conditions e.g. not on days of rain, high wind or flooding
- quarrying and sand carting operations to occur on-site only during business hours (7am-6pm Monday to Friday and 8am -12noon Saturday)
- quarrying pits and stockpiles are to be examined prior to work starting each day to remove any reptiles or other fauna that may be within the work site
- quarrying site to be marked out using permanent markers
- quarrying/carting operations will cease if severe wind conditions are present
- species profiles to be kept on site of threatened species that have potential to inhabit the site
- staff inducted on refuelling procedures
- staff inducted on refuelling procedures and no oils fuels or lubricants to be stored on-site
- no refuelling within 40m of the waterway
- staff trained in best practice in all areas of sand quarrying
- supervision of earthworks will be undertaken by a suitably qualified/experienced mines manager, as per company policy
- temporary sediment control structures must be maintained at all times during extraction and checked, repaired, replaced or cleaned out after any significant rainfall event

- the extractive industry licence holder will ensure that no machinery, fuels, oils, chemicals, hazardous substances or other construction equipment will be stored within the stockpile area when not in use
- the extractive industry licenced areas will be monitored regularly for the presence of noxious weeds to avoid spreading weeds in sand transported to other areas of the property
- the licence holder will ensure that no machinery, fuels, oils, chemicals, hazardous substances or other construction equipment will be stored within the extraction site when not in use.
- quarrying to cease 1m from the bank and a 1:3 batter developed

5.0 Risk Management

Table 10 provides an overview of the risks associated with the proposed sand quarry. The table should be read down the left-hand side column to identify the issues at the site and then the activities, processes or facilities are listed across the top of the table.

The table has been completed using a risk assessment of low (L), medium (M) and high (H) and not applicable (n/a).

Table 10: Environmental Risk Identification Matrix

	Activity, Process or Facility															
Issue	Land preparation, vegetation & topsoil stripping	All construction activities including earth moving	Mine development and mining, surface & u'ground	Use/maintenance of roads, tracks and	Waste rock emplacement management	Mineral processing facilities and operations	Ore/product stockpiling and handling	Tailings impoundment management	water management including storm event contingencies	Hazardous materials & fuel handling/spills management	Sewerage	Other infrastructure use and operation	Rubbish disposal	Rehabilitation activities	Rehabilitation maintenance, pending self-sustainability	Rehabilitated land and remaining features
Natural resources use	L	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L	L	L
Hydrology and geomorphology	L	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L	L	L
Floodplain and riparian habitat	L	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L	L	L
Erosion and sedimentation	L	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L	L	L
Surface water	L	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L	L	L
Groundwater	L	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L	L	L
Soils	M	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L	L	L
Flora	M	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L	L	L

Legend – L=Low, M=medium, n/a not applicable

6.0 Environment Management and Rehabilitation Plan

Rehabilitation will occur prior to the end of the extractive industry license term.

No other rehabilitation works will be required as the project will have minimal impacts on the licence area and the surrounding environment. Refer to the Environmental Management and Rehabilitation Plan (EM&RP) for more information on rehabilitation.

6.1 Proposed end land use

It is proposed that the site will be returned as near as possible to their original condition at the end of quarrying activities. When the site is vacated, the land will be used for grazing. All batters will be left at 1 in 4 slope or less and replacement sand will naturally occur following the next creek flow event.

6.2 Techniques for proposed rehabilitation

Rehabilitation of the quarry will include techniques such as:

- diverting rainfall runoff from gully heads (should they form) to more stable areas through minor earthworks
- installing a gully control dam or drop structure at the head of the gully, using a pipe or rock to convey water to the gully floor
- managing gully lines by slowing water flow and promoting sedimentation with a series of small check or grade stabilisation structures
- filling and reshaping of gullies will be undertaken only when existing gullies stabilise

6.2.1 Proposed quarrying area

Rehabilitation will be ongoing throughout the life of the project and be completed prior to the end of the extractive industry licence term. The objectives of rehabilitation include:

- developing a final landform with minimal necessary earthworks suitable for pre- extraction land uses
- providing a safe final landform with long term stability and low future maintenance requirements
- ensuring the site does not impact on the surrounding environment through gullying and other erosion processes
- ensuring the safety of quarry development and landform stability through compliance with the *NSW Mines Inspection Act 1901*, and its 2000 amendments and General Rule 2000.

The landform is proposed to be a depressed shape to the bed of the creek.

No quarrying to occur within the drip line of the trees or within close proximity to the bank of the creek.

6.3 Schedule for rehabilitation

Rehabilitation of the proposed quarry will be ongoing and will be completed by the end of the licence period. However, during the quarrying period, the sites will be managed to ensure erosion does not occur. As stated in section 4, this could include engineering solutions and earthworks, such as installing rock or straw bales to divert water flow away from gully heads should they develop.

6.4 Measures to ensure stability of the area

Erosion will be monitored during operations when/if the creek flows during the operations. Ongoing monitoring will ensure that if erosion starts to occur, management activities can be implemented to stop the erosion. This monitoring will be undertaken by the landholder.

6.5 Erosion rehabilitation measures

As mentioned above, erosion has the most potential to inhibit successful rehabilitation. All measures above are designed to minimise or mitigate erosion potential.

7.0 Summary of impacts and conclusions

Table 11 summarises the potential impact of the project, following a thorough on-site assessment and various database searches on threatened species and cultural heritage. Overall, the level of impact is expected to be low and this is further reduced through the implementation of mitigation measures summarised in section 4.

Table 11: Summary of potential impacts

Section	Potential impact	Summary of impacts
4.1	Natural resource use	Removal of sand
4.2	Hydrology and geomorphology	No impact through mitigation measures
4.3	Floodplain and riparian habitat	No impacts through mitigation measures
4.4	Erosion and sedimentation	Removal of sedimentation from creek bed
4.4	Surface water	No impact, maintain natural systems
4.6	Groundwater	No impact
4.7	Soils	Removal of soil
4.8	Matters of NES	No impacts, no referral required
4.9	Flora	No native vegetation will be removed. No quarrying within the drip line of trees within the creek bed, no impact on threatened species
4.10	Fauna	No impact on threatened species or critical habitat
4.11	Weeds and pests	No impact, existing weeds to be controlled
4.12	Heritage	No impact
4.13	Air quality	Minimal impact through vehicle emissions, dust from quarrying activity
4.14	Socio and economic	No adverse impacts
4.15	Transport	Minor additional vehicle traffic, mitigation measures agreed with the Silverton Village Committee
4.16	Noise and vibration	Use of machinery to extract, load and cart sand
4.17	Bushfire hazards	No impacts
4.18	Chemical and hazardous Substance	None stored on site
4.19	Waste minimisation	No adverse impacts

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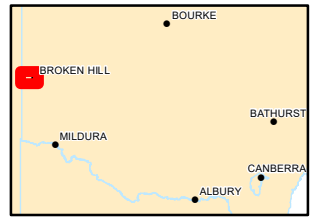
Appendix A: Map series



LEGEND

- AHIMS Site
- GW Bore
- Main Highway
- Project Extent

N

0 2,000 4,000 6,000 8,000 m

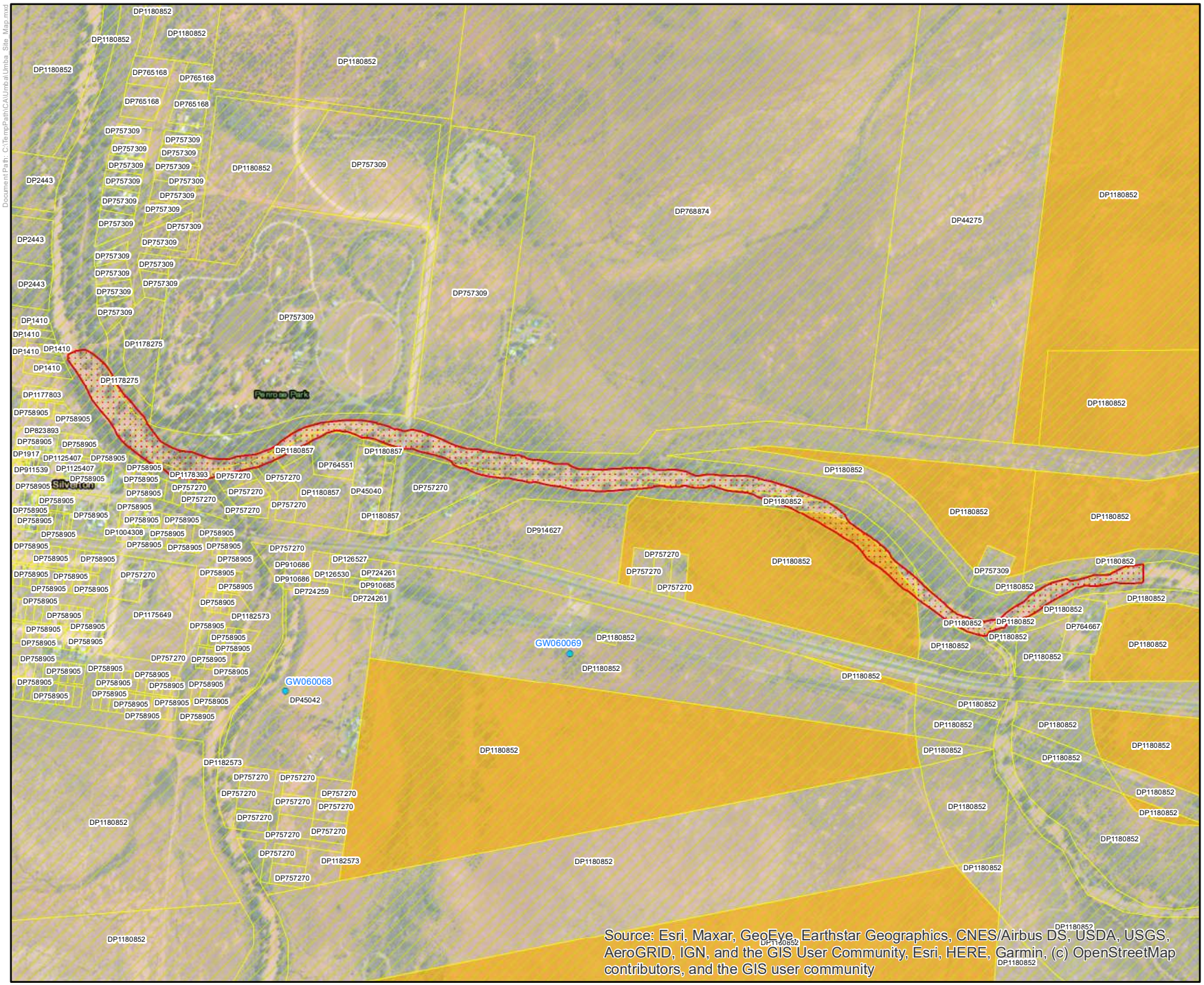
Scale 1:5,000 @ A4

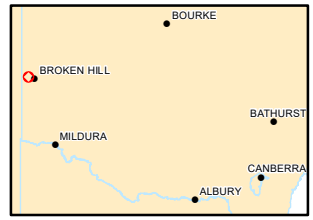
Coordinate System: GDA 1994 MGA Zone 54

greenedge environmental

Figure **1**

Umberumberka Creek
Flood Mitigation Quarry
Location Map





LEGEND

- GW Bore
- Proposed Quarry Extent
- Lot
- Aboriginal Land Claim

IBRA Subregion

- Barrier Range

N

0 50 100 150 200 m

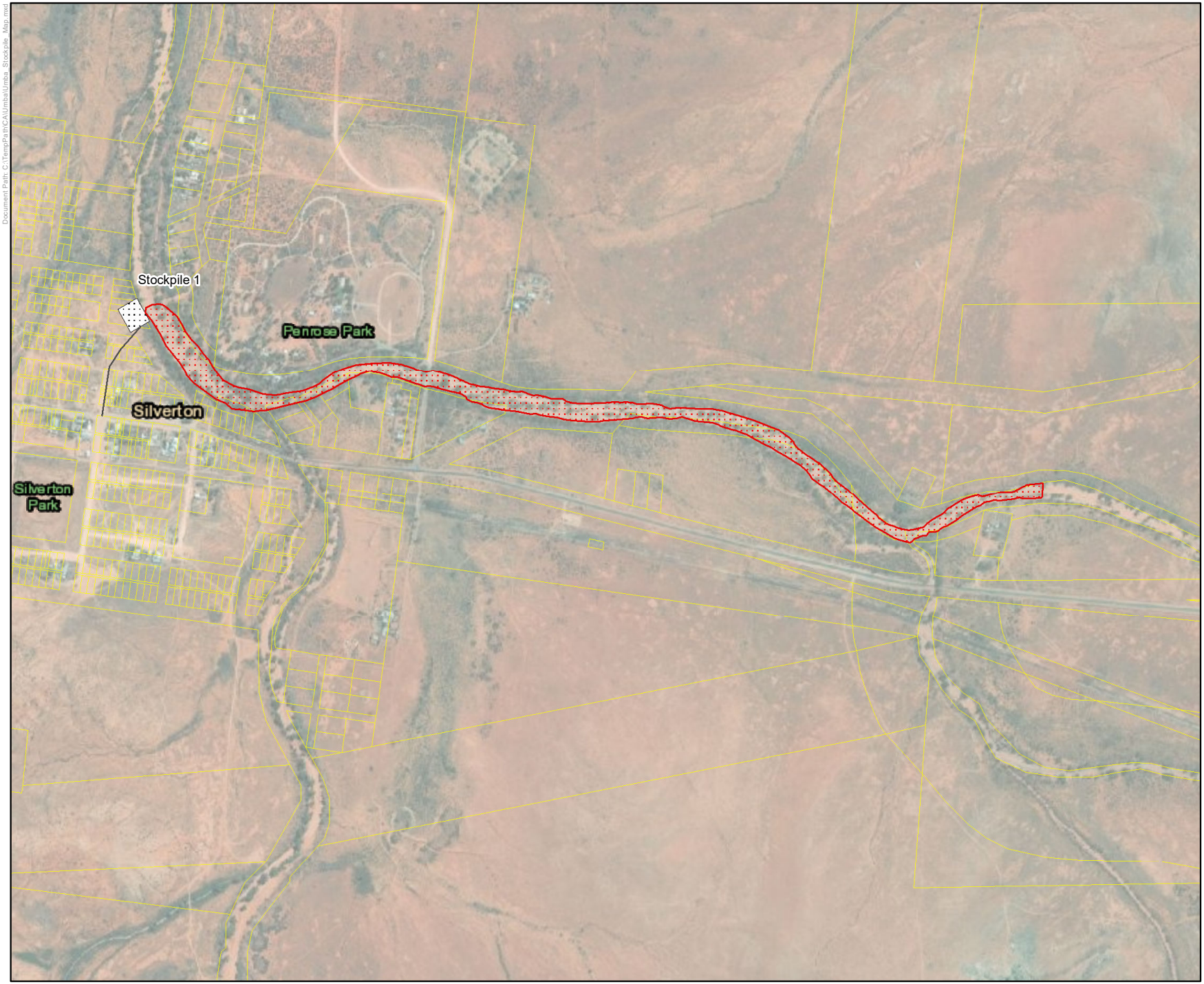
Scale 1:5,000 @ A4

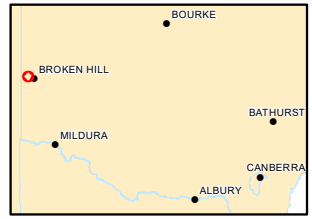
Coordinate System: GDA 1994 MGA Zone 54

greenedge environmental

Figure **2**

Umberumberka Creek Flood Mitigation Quarry Site Map





LEGEND

- Access Track
- Proposed Quarry Extent
- Stockpile Area
- Lot

N

0 100 200 300 400 m

Scale 1:5,000 @ A4

Coordinate System: GDA 1994 MGA Zone 54

greenedge environmental

Figure **1**

Umberumberka Creek
Flood Mitigation Quarry
Stockpile Map

Appendix B: Threatened species searches

NSW Threatened Fauna

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Public Report of all Valid Records of Animals in selected area [North: -31.83 West: 141.17 East: 141.27 South: -31.93] returned a total of 77 records of 63 species.

Report generated on 26/08/2022 3:22 PM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Animalia	Reptilia	Agamidae	5243	*Ctenophorus mirrityana*		Barrier Range Dragon	E1,P		1	
Animalia	Reptilia	Elapidae	2697	*Pseudonaja modesta*		Ringed Brown Snake	E1,P		1	
Animalia	Aves	Acanthizidae	9950	*Calamanthus campestris*		Rufous Fieldwren	V,P		3	

NSW Threatened Flora

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Public Report of all Valid Records of Plants in selected area [North: -31.83 West: 141.17 East: 141.27 South: -31.93] returned a total of 120 records of 83 species.

Report generated on 26/08/2022 3:22 PM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Plantae	Flora	Fabaceae (Faboideae)	3048	*Swainsona murrayana*		Slender Darling Pea	V	V	1	
Plantae	Flora	Fabaceae (Mimosoideae)	10061	*Acacia carneorum*		Purple-wood Wattle	V	V	8	

NSW Threatened Communities

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Public Report of all Valid Records of Communities in selected area [North: -31.83 West: 141.17 East: 141.27 South: -31.93] returned 0 records for 2 entities.

Report generated on 26/08/2022 3:23 PM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Community				*Acacia loderi shrublands*		Acacia loderi shrublands	E3		K	
Community				*Porcupine Grass—Red Mallee—Gum Coolabah hummock grassland/low sparse woodland in the Broken Hill Complex Bioregion*		Porcupine Grass—Red Mallee—Gum Coolabah hummock grassland/low sparse woodland in the Broken Hill Complex Bioregion	E4B		K	

Australian Government
Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 26-Aug-2022

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	14
Listed Migratory Species:	8

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	13
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	2
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Species			[Resource Information]
Status of Conservation Dependent and Extinct are not MNES under the EPBC Act. Number is the current name ID.			
Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Amytornis modestus Thick-billed Grasswren [84121]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area	In feature area
FISH			
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
MAMMAL			
Notomys fuscus Dusky Hopping-mouse, Wilkiniti [125]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pseudomys australis Plains Rat, Palyoora, Plains Mouse [108]	Vulnerable	Species or species habitat may occur within area	In feature area
PLANT			
Acacia carneorum Needle Wattle, Dead Finish, Purple-wood Wattle [66685]	Vulnerable	Species or species habitat known to occur within area	In feature area
Frankenia plicata [4225]	Endangered	Species or species habitat likely to occur within area	In feature area
Pterostylis xerophila Desert Greenhood [7997]	Vulnerable	Species or species habitat may occur within area	In feature area

Listed Migratory Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Corporation [15197]	NSW	In feature area

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area overfly marine area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rostratula australis as Rostratula benghalensis (sensu lato)			
Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Extra Information

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Development of Silverton Wind Farm	2009/4847	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Appendix C: Test of significance

Test of significance for Umberumberka Creek Flood mitigation quarry

Introduction

This test of significance is part of the statement of environmental effects (SEE) for the Umberumberka Creek Flood mitigation quarry, north-west of Broken Hill, NSW. The objective of this proposal remove the build of up sand within the creek, which could lead to flooding of the Silverton Township and to secure a source of sand, up to 2.0m deep across site.

In respect to terrestrial biodiversity values, the area is modified (through grazing and human recreation) and contains the species commonly found in such environments, including native grasses and colonising small shrubs. The proposed works lie within the unincorporated area and also within the Western Local Lands Service (LLS) region. The local area is classified as the Barrier Range in respect to biodiversity and the vegetation is described as River Red Gum open woodland of intermittent watercourses manly of the arid climate zone vegetation community.

The following threatened species has potential to occupy the site and has triggered a test of significance:

- Slender Darling-pea (*Swainsona murrayana*) (Vulnerable – State and Commonwealth)
- Ringed Brown-snake (*Pseudonaja modesta*) (Endangered – State, not listed - Commonwealth)

Slender Darling-pea

(1) The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

(**a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction**

A sparsely-downy forb with greyish, thin or tapered, stiffly leathery pods. The pea-like flowers are pink or purple with red stripes on densely and darkly hairy slender stalks. It is distinguished by the strongly twisted hypanthium and keel with retracted tip.

Due to the small nature of the proposal, and the availability of surrounding habitat, no impacts to the species are expected. No local viable populations of the species are known from this area that could be placed at risk of extinction.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

N/A – Slender Darlin-pea is not considered an endangered ecological community, but a single species, therefore no ecological communities are placed at risk of extinction.

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

N/A – Slender Darling-pea is not considered an endangered ecological community, but a single species, the development is not likely to substantially and adversely modify the composition of an endangered community, therefore placing it at risk.

(c) in relation to the habitat of a threatened species or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and
Due to the small nature of the proposal, only minor modification to potential habitat could be impacted.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and
The proposal will not cause fragmentation or isolations from other potential habitats.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,
The habitat proposed to be modified is not critical to the long-term survival of the species.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),
The area proposed for the quarry in not mapped as an area of outstanding biodiversity value (OBV).

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.
The action does not constitute part of the following key threatening process as listed in the BC Act 2016 Schedule 4.

Ringed Brown-snake
(1) The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

(**a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction**
The Ringed Brown Snake occurs in a variety of habitats including arid shrublands, hummock grasslands, low rocky outcrops and dry watercourses (Swan 1990; Cogger 2000). The specific habitat requirements of the species are largely unknown (Sadlier *et al*. 1996), however the species is known to be terrestrial and to shelter under surface debris or in spinifex, *Triodia* species.

Due to the small nature of the proposal, and the availability of surrounding habitat, no impacts to the specie are expected. No local viable populations of the species are known from this area that could be placed at risk of extinction.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or
N/A – Ringed Brown-snake is not considered an endangered ecological community, but a single species, therefore no ecological communities are placed at risk of extinction.

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,
N/A – Ringed Brown-snake is not considered an endangered ecological community, but a single species, the development is not likely to substantially and adversely modify the composition of an endangered community, therefore placing it at risk.

(c) in relation to the habitat of a threatened species or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and
Due to the small nature of the proposal, only minor modification to potential foraging habitat and no existing nesting sites will be impacted.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and
The proposal will not cause fragmentation or isolations from other potential foraging habitats.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,
The habitat proposed to be modified is not critical to the long-term survival of the species.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),
The area proposed for the quarry in not mapped as an area of outstanding biodiversity value (OBV).

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.
The action constitutes part of the following key threatening processes as listed in the BC Act 2016 Schedule 4:

- Fragmentation, resulting from clearing or degradation of the habitat has reduced genetic variability and reproductive opportunities and has increased genetic isolation and the potential for significant impacts arising from stochastic events such as drought or fire.

Conclusions

The assessment of significance for:

- Slender Darling-pea
- Ringed Brown-snake

revealed that the potential impacts of the proposal on the threatened species or communities are extremely unlikely and where there could be potential impacts, they will be very low. Potential minor impacts resulting from the proposed works are not expected to increase the likelihood of a threatened or endangered species becoming extinct.

The test of significance for these threatened species does not trigger the requirement for a species impact statement (SIS). The proposal is deemed to be non-significant for the assessed species. In determining the significance of the proposed works on threatened species, the following matters were taken into consideration:

- implementation of the proposed works, including preconstruction, construction, operation and maintenance phases
- activities to be undertaken in the area following the proposed works
- all direct and indirect impacts, on and off-site impacts through all phases
- the frequency and duration of each known or likely impact/action
- the total impact which can be attributed to that action over the entire geographic area affected initially and over time
- the sensitivity of the receiving environment
- the degree of confidence with which the impacts of the action are known and understood.

Appendix D: AHIMS Database Search

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : Umberumberka Creek

Client Service ID : 728554

Green Edge Environmental

178 Jutland Road
Springton South Australia 5235

Attention: Chris Alderton

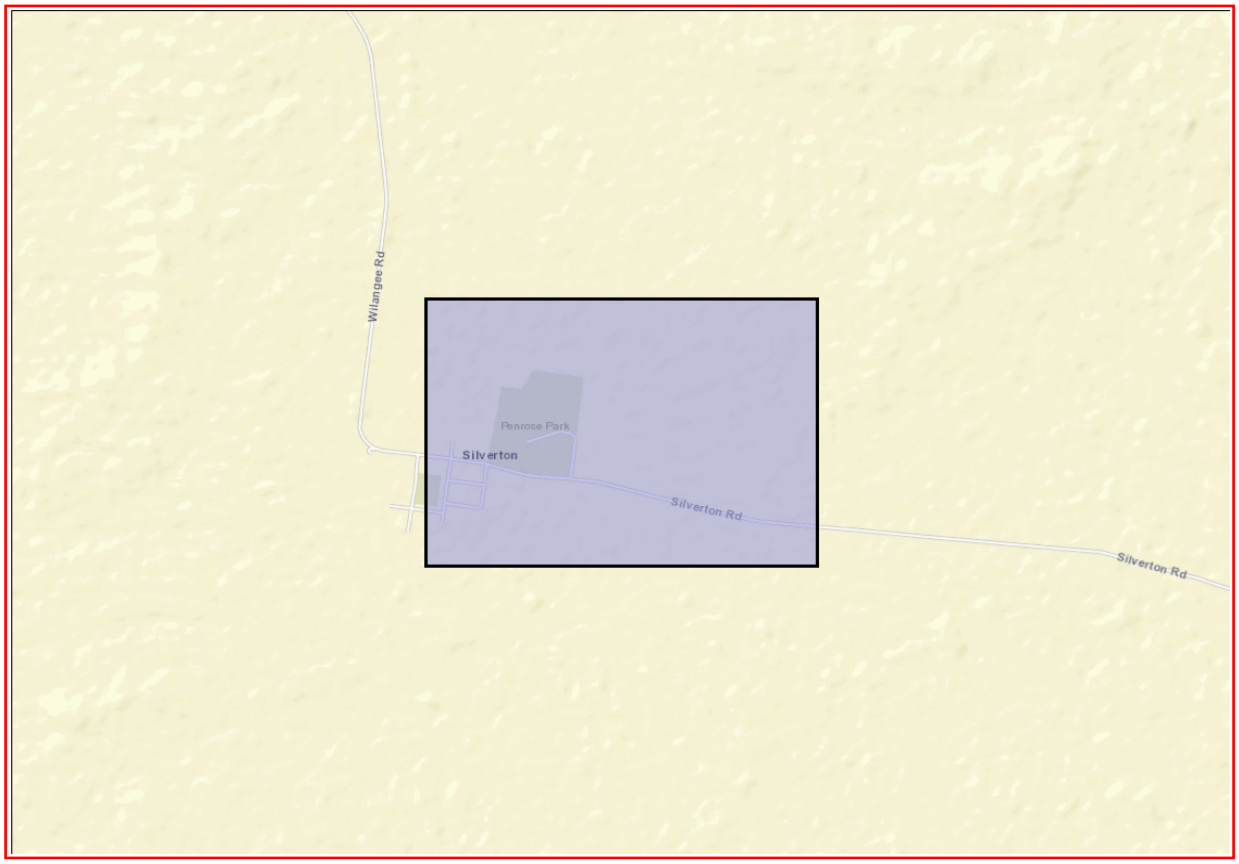
Email: chris@geenvironmental.com.au

Date: 01 November 2022

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -31.8919, 141.221 - Lat, Long To : -31.8736, 141.2519, conducted by Chris Alderton on 01 November 2022.

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



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

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

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

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

Important information about your AHIMS search

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

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

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

Appendix E: Colour plates

Photo 1: Typical bank within the creek

Photo 2: Typical landscape across the proposed quarry

Photo 3: Typical sandy surface along the creek bed.

Photo 4: Some small rocky areas within the creek bed.

Photo 5: Penrose Park Road causeway with sand build up on the downstream site

Photo 6: Downstream view from the Penrose Park Road causeway

Appendix F: Broken Hill Local Aboriginal Lands Council Site Assessment

BROKEN HILL LOCAL ABORIGINAL LAND COUNCIL

ABN: 65 422 854 650
84 Oxide Street. PO Box 392, BROKEN HILL NSW 2880
Telephone: 08 8087 7413 / 8087 7310
Email: admin@bhlalc.org.au

22nd March 2023

CMC Consolidated
PO Box 5079
Broken Hill NSW 2880

To whom it may concern,

The Broken Hill Local Aboriginal Land Council confirm that an Aboriginal Cultural Sites survey was completed on the 22nd March 2023. The survey was conducted by Ricky Menz and Raymond B O'Donnell Snr. The Broken Hill LALC Sites Officers have confirmed that no Aboriginal artefacts were found in the surveyed area.

The Broken Hill LALC board endorse your license application although request that the following protocols be adhered to.

1. That no work is to be conducted within an unsurveyed area
2. All ground surface disturbance in the license area should cease immediately if any suspected Aboriginal artefacts are uncovered.
    a) The discoverer of the find(s) will notify machinery operators in the immediate vicinity of the find(s) so that work can be halted and ensure that there is no further harm to the object
    b) Secure the area and prevent equipment or personnel from entering the area except in accordance with this protocol
    c) The site supervisor will be informed of the find(s).
    d) It is recommended that a spotter be in place during the duration of the project.
3. If there is substantial doubt regarding an Aboriginal origin for the finds, then gain a qualified opinion from an archaeologist and the Broken Hill Local Aboriginal Land Council as soon as possible.
4. Immediately notify the following authorities or personnel of the discovery:
    a) Department of Planning and Environment (Heritage Line: 131 555); and
    b) Broken Hill Local Aboriginal Land Council and the Wilyakali Aboriginal Corporation Representatives
5. Where the find(s) are determined to be Aboriginal Objects, any re-commencement of construction related ground surface disturbance may only resume in the area of the find(s) following compliance with any consequential legal requirements and gaining written approval from Department of Environment and Planning.

Karen Hastwell

Acting Chief Executive Officer

Appendix G: Cultural heritage contingency plan

Contingency plan in the event of Aboriginal material being found

If any Aboriginal object is discovered and/or harmed in, or under the land, while undertaking gravel pit development activities, the proponent must:

1. Not further harm the object;
2. Immediately cease all work at the particular location;
3. Secure the area so as to avoid further harm to the Aboriginal object;
4. Notify DPE-Environment and Heritage as soon as practical on 131 555, providing any details of the Aboriginal object and its location; and
5. Not recommence any work at the particular location unless authorised in writing by DPE-Environment and Heritage.