Constellation Project

Amendment Report – Supporting Information



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Acronyms and Abbreviations

Acronym	Description
AARC	AARC Environmental Solutions Pty Ltd
ACHA	Aboriginal Cultural Heritage Assessment
BSC	Bogan Shire Council
BAM	Biodiversity Assessment Method
BDAR	Biodiversity Development Assessment Report
CPHR	Conservation Programs, Heritage and Regulation Group
CRN	Country Regional Network
DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
DPHI	Department of Planning, Housing and Infrastructure
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
FMP	Fire management plan
GHG	Greenhouse Gas
NNWW	Ngemba, Ngiyampaa, Wangaaypuwan, Wayilwan

Executive Summary

The Constellation Project is a state significant development (SSD-4579871) owned by Tritton Resources Pty Ltd (a wholly owned subsidiary of Aeris Resources Ltd). The Constellation Project (the Project) proposes the development of a new copper mining area approximately 20 km northeast of Girilambone, in western New South Wales. The proposed Project will operate under a 'hub and spoke model', where mined ore will be transported from the Project to the existing Tritton Copper Mine for processing and eventual distribution to markets.

An Environmental Impact Statement (EIS) for the Project was submitted in July 2024, with the Project having subsequently undergone public exhibition and ongoing stakeholder engagement. Following a thorough review of feedback from government agencies, local councils, and the community, Aeris Resources has also submitted a Response to Submissions Report (13 May 2025), addressing comments raised during the EIS public exhibition process.

The Constellation Project is positioned strategically to extend the operational lifespan of Tritton Copper Operations . The proposed Project entails mining copper ore through an open-cut pit and associated underground operations, with an average annual output of approximately 500,000 tonnes (of copper ore), increasing to approximately 1 million tonnes during peak production years. The anticipated mine life spans approximately 16 years, encompassing construction, operation, and rehabilitation phases.

Since the submission of the EIS for the Project, opportunities to effect minor design improvements have been identified, resulting in the development of this amendment application. Proposed design improvements have arisen in response to ongoing stakeholder engagement and detailed engineering design. These minor proposed amendments are identified as:

- Installation of an underground electrical conduit for future grid connection, co-located within the proposed infrastructure corridor.
- Realigning the infrastructure corridor around the Crown Land parcel identified as Lot 10 of Deposited Plan (DP) 48604.
- Realigning the infrastructure corridor on Lots 13 and 19 of DP 751311, and Lot 2 of DP 1296861.
- Revisions to Construction Hours: with construction operation hours now proposed to extend to 24 hours per day, seven days a week, to increase flexibility and minimise potential schedule disruptions (such as due to inclement weather).

The Project will significantly contribute to local employment and regional economic development. This aligns with various State, Regional and Local government strategies, seeking to encourage investment within regional NSW. The Project also proposes the recovery of copper, which is considered a critical mineral to support a transition towards decarbonisation of our State and Federal economies. The Project therefore supports commitments to emissions reductions and advancing renewable energy technologies. Mining operations are also essential in driving economic growth and providing employment opportunity in the predominately agricultural Bogan Shire local government area.

A comprehensive re-assessment of the potential environmental impacts of the proposed minor design amendments have been conducted as part of this amendment application. This has included, but not been limited to, an updated assessment of potential impacts to soil and land, water, biodiversity, greenhouse gases, air, noise, waste, cultural heritage, social, economic, transport and visual amenity.

Updated assessment findings have determined that the project will comply with all environmental assessment criteria and that mitigation measures identified in the EIS remain appropriate for the proposed Project. Updated assessment are overviewed in detail throughout this report and supporting appendices.

It is also noted that Aeris Resources has maintained a commitment to community engagement throughout the Project lifecycle, with ongoing consultation and input from local stakeholders being considered. Positive discussions have continued with landowners, Aboriginal representatives, and community members to ensure that potential impacts resultant of design changes are considered and addressed, while potential benefits to

local and regional communities are also maximised. Most recently, a community meeting was undertaken with interested stakeholders in Girilambone, on 6 August 2025.

The Constellation Project is poised to play a crucial role in the future of the Tritton Copper Operations, addressing the urgent need for resource sustainability while supporting local economic growth. The proposed amendments to the Project demonstrate a proactive approach to stakeholder concerns and environmental management, ensuring that the Project not only meets regulatory requirements, but also fosters community trust and economic advancement within the region.

1 Introduction

The Constellation Project is a state significant development (SSD-41579871) being assessed under the NSW *Environmental Planning and Assessment Act 1979*. Aeris submitted the development application to the Department of Planning, Housing and Infrastructure (DPHI) in July 2024, accompanied by an Environmental Impact Statement (EIS). The EIS was publicly exhibited between 15 August 2024 and 11 September 2024 to seek opinions from the government agencies, local councils, and the community. On 12 September 2024, the DPHI requested Aeris to submit a written response to the matters raised by NSW government agencies, Bogan Shire Council, and the community during the public exhibition of the EIS. The Response to Submissions (RtS) Report was submitted to address the matters raised from the 12 submissions received, on 13 May 2025. DPHI invited comments on the RtS Report, from those that made submissions, via the NSW Major Projects Planning Portal (planning portal). Additional information was provided via the planning portal to address comments provided by submission responders.

Under the NSW Environmental Planning and Assessment Regulation 2021 (EP&A Regulation), an applicant may, with agreement of the consent authority – amend or vary an application at any time before it is determined. This report describes the amendments being sought, the reasons for the amendment and detailed assessment of the impacts for the project. To further support this process, engagement with DPHI representatives has been undertaken on 02 July 2025 and 07 August 2025.

The report has been prepared to address the requirements of the State significant development guidelines – preparing an amendment report (DPIE 2021).

1.1 Applicant details

The applicant and Project details are provided in Table 1.

Table 1: Applicant and Project details

Aspect	Project Details
Project Title	Constellation Project
Assessment Type	State Significant Development
State Significant Development Application Number	SSD-4579871
Applicant	Tritton Resources Pty Ltd
Contact	gbrown@aerisresources.com.au
Development Type	Minerals Mining
Location	Okeh, 1890 Okeh Road, Girilambone
Local Government Area	Bogan Shire

1.2 Project summary and regional setting

The Constellation Project (the Project) is a proposed copper mine (mining area) located approximately 20 km north-east of the township of Girilambone and approximately 55 km north-west of Nyngan, within the Bogan Shire Council local government area. The regional location of the Project is shown in Figure 1.

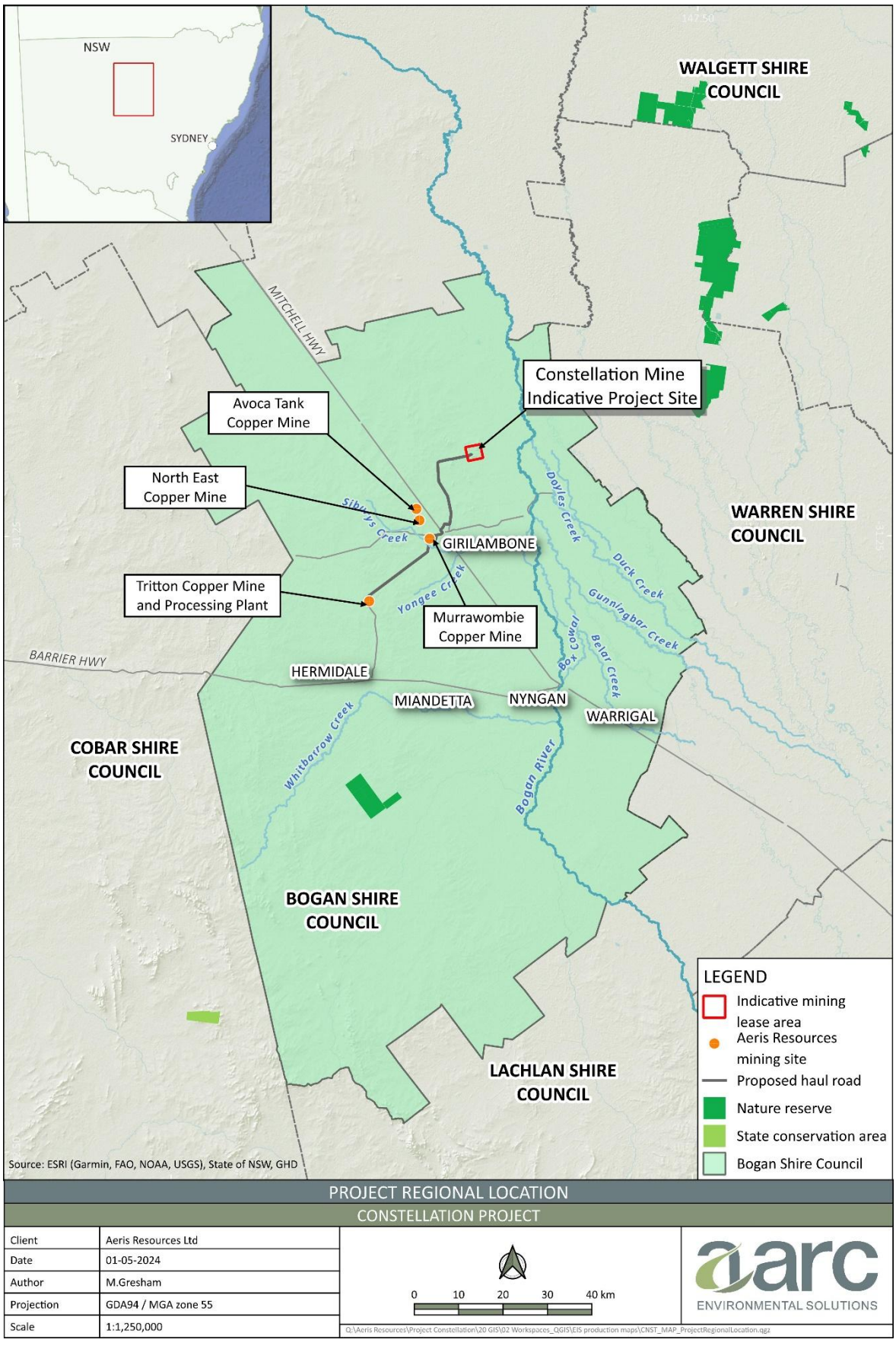


Figure 1: Project regional location

The proponent for the proposed Project is Tritton Resources Pty Ltd—a wholly owned subsidiary of Aeris Resources Ltd (Aeris). Aeris is an Australian Securities Exchange listed base and precious metals producer.

Aeris owns and operates 'Tritton Copper Operations' in central-western New South Wales (NSW) and strategic mining assets and tenements in Western Australia, Victoria and North Queensland.

Tritton Copper Operations functions as a hub and spoke model, with 'Tritton Copper Mine' serving as the centralised hub (where the processing facility is located) with other surrounding deposits supplying ore for processing. The Constellation Project is a proposed new satellite deposit of Tritton Copper Operations, located approximately 45 km north-east of the existing Tritton Copper Mine (Figure 1).

The Project proposes to mine copper ore by developing an open cut pit and underground mine. Mined ore will be transported via road to Tritton Copper Mine for processing, mostly via existing road networks and two sections of proposed new road. Lower-grade oxide ore will be processed by heap leaching at the Constellation Project site. Transport of dewatered tailings material from Tritton Copper Mine back to the Project site (for use in cemented paste fill) will support the underground mining activities at the Project.

The Project proposes to mine an average of 500,000 tonnes of copper ore per annum to replace depleting production from Aeris' existing Tritton Copper Operations. However, peak volumes of ore transported to the Tritton Copper Mine may be up to 1 million tonnes per annum.

To mine the copper ore resource, the Project proposes open cut mining a relatively small pit and underground mining operations by long hole stoping and backfilling. The anticipated mine life is approximately 16 years. This includes an estimated one-year construction period, ten years of mining operations, and five years of decommissioning and rehabilitation activities. There is potential for future mine life extensions as the deposit is developed down plunge (to depth). Rehabilitation will occur progressively where possible, noting that disturbance associated with the Project site will comprise an area of approximately 170 hectares.

1.3 Proposed amendment and justification

Since lodging the EIS, Aeris have continued to progress engineering design related to constructing and operating aspects of the Project. Aeris have also consulted with stakeholders, including affected landholders, NSW government departments, and Bogan Shire Council.

As an outcome of the engineering design and stakeholder engagement, Aeris seek to amend the Project description and the EIS and make minor refinements to aspects of the Project. These amendments seek to:

- Install an underground electrical conduit for future grid connection, co-located within the proposed infrastructure corridor.
- Realign the infrastructure corridor around the Crown Land parcel identified as Lot 10 of Deposited Plan (DP) 48604.
- Realign the infrastructure corridor on Lots 13 and 19 of DP 751311, and Lot 2 of DP 1296861.
- Make revisions to Construction Hours: with construction operation hours now proposed to extend to 24 hours per day, seven days a week, to increase flexibility and minimise potential schedule disruptions (such as due to inclement weather).

The proposed amendments are further detailed in section 3.

2 Strategic context

Tritton Copper Operations is seeking approval for the economic continuation of operations through the development of the Constellation Project. With copper recognised as a vital resource for modern technological needs, the proposed Project will support local employment, contribute to economic resilience, and ensure the continuation of mining operations through the efficient utilisation of existing infrastructure.

2.1 Alignment of the Project with government strategies

The proposed Project aligns strategically with international, federal, and state policies aimed at achieving environmental sustainability. It supports Australia's commitments, with international frameworks such as the 'United Nations Framework Convention on Climate Change' (UNFCCC) and the Australian Government's 2050 net-zero emissions target. Copper produced by the Project will play a crucial role in advancing renewable energy technologies, thereby contributing to global decarbonisation efforts.

At the state level, the Project aligns with the New South Wales (NSW) Government's Net Zero Plan, the NSW Minerals Strategy, and the Critical Minerals and High-Tech Metals Strategy, reinforcing the importance of copper as a critical mineral essential for future industries. Local community plans, such as the Bogan Shire Community Strategic Plan, underscore the Project's potential to drive economic growth and employment in the region.

2.2 Land use planning considerations

Characterised by a low population density, the Bogan Shire local government area primarily relies on agriculture and mining. Local planning frameworks, such as the Bogan Local Environmental Plan and the Bogan Shire Council Strategic Planning Statement, emphasise the crucial role that mining plays as an economic driver for the local region.

Tritton Copper Operations is a key employer within the region, with approximately 48% of the workforce employed being local to the region, showcasing considerable potential for further expansion. The ongoing operation of the Tritton Copper Mine is not only essential for local economic development but also vital for sustaining the population and achieving the aims set out in the Bogan Shire Council's Local Strategic Planning Statement.

The Project site is situated on freehold land, bordered by agricultural properties and other mining operations.

2.3 Environmental impact and risk assessment

A comprehensive environmental risk assessment has been conducted adhering to best practice guidelines, identifying approximately 75 potential risks, which are considered manageable with controls. Factors such as noise, air quality, and traffic have been evaluated, with mitigation measures planned to address identified risks effectively.

2.4 Cumulative impact potential

A cumulative impact assessment was prepared for the original EIS submission (EIS Chapter 6.17), using the Cumulative Impact Assessment Guidelines for State Significant Projects (Cumulative Impact Guidelines) (Department of Planning, Industry and Environment NSW (DPIE), 2022). As per the DPIE Guideline (2022), cumulative impact assessments should be proportionate to the scale and significance of the potential cumulative impacts of the proposed Project, combined with the impacts of other relevant future projects.

All impact assessments undertaken for the proposed Project considered existing projects within baseline conditions. Impacts on all relevant environmental values have been re-assessed for the proposed amendments, to meet relevant regulatory requirements.

2.5 Planning Agreements

Aeris is engaging with Bogan Shire Council to finalise a voluntary planning agreement (VPA), including a Road Use Agreement (RUA) conditioned within the VPA. The VPA and RUA are to have agreed terms in August and September 2025 respectively. The purpose of these agreements is to ensure road maintenance is undertaken and where necessary, road upgrades are completed, to manage road condition impacts from haulage activities. The RUA includes the sealing a section of Okeh Road in front of Karingal Homestead; a section of new haul road at Mitchell Highway intersection, near Girilambone Town; and near the council dam to mitigate dust.

A Community Benefits Fund and a Workforce Accommodation Strategy are also being prepared for the Project; noting these will be conditioned within the VPA.

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3 Description of the amendments

This section describes the proposed amendments and refinements to the Project description, with a comparison between the original project and the proposed amendments presented in Table 2. Further, Section 3.1.1 to 3.2 provide a detailed description of each proposed amendment.

Table 2: Amended project summary table

Project Element	Original Project	Amended Project
Disturbance Project Footprint	• The proposed Project surface disturbance area is approximately 170 ha.	• Overall, there is a reduction in the area of disturbance of 0.08 ha for the Project area by the proposed road realignments, therefore no change to the surface disturbance total area is proposed.
Lot on plan detail changes	• Haul road construction: o Lot 19 of DP751311 • Crown land o The Project infrastructure corridor is proposed to traverse Lot 1 of DP879749 (Crown land leased) and Lot 10 of DP48604 (an unformed road in a Category C Crown Reserve).	• Haul road construction: o Lot 19 of DP751311, Lot 2 of DP1296861 and Lot 13 of DP1296861 • Crown land: o The Project infrastructure corridor is proposed to traverse Lot 1 of DP879749, avoiding any interaction in Category C Crown reserve lot
Infrastructure corridor	• An infrastructure corridor approximately 18 m wide, containing the site access/haul road; and an underground water pipeline, optic fibre cable; will extend between the Project site and the existing Murrawombie Copper Mine.	• An infrastructure corridor approximately 18 m wide, containing the site access/haul road; and buried services including underground water pipeline, optic fibre cable, and conduit for potential electrical cabling (power supply); will extend between the Project site and the existing Murrawombie Copper Mine.
Site access	• The proposed infrastructure corridor will predominantly utilise existing public roads. Operational traffic movements and deliveries to the Project mine site will be via Okeh Road.	• The proposed infrastructure corridor will predominantly utilise existing public roads. Operational traffic movements and deliveries to the Project mine site will be via Okeh Road. • The haul road and infrastructure corridor propose to deviate around Lot 10 of DP48604.
Mitchell highway intersection with the haul road	• Road upgrades are proposed to the existing Railway Road and Mitchell Highway intersection, which will include a channelised right-hand turning lane (for southbound traffic on the Mitchell Highway). A channelised right-turn treatment is also proposed for the intersection of	• There will be a minor refinement to the original proposed infrastructure corridor, for the purpose of enabling safe truck turning

Project Element	Original Project	Amended Project
	the new road and Mitchell Highway (for northbound traffic on the Mitchell Highway).	areas for each intersection with the Mitchell Highway intersections. This is within the previously disturbed area of land adjacent to the sealed road.
Power supply	• Mains power will be generated at the Project site using a combination of 6 MW DC solar photovoltaic (PV) (12 ha area) and a 5,000 kVA diesel genset.	• To support future power supply optionality, an underground electrical conduit will be installed within the infrastructure corridor. This may be of benefit, should grid connection become available in the future.
Hours of operation	• Construction activities during the Project's construction phase will be undertaken between 06:00 am and 10:00 pm seven days a week.	• Construction activities during the Project's construction phase will be undertaken 24 hrs a day seven days a week, in some locations (over 2 km away from any sensitive receptors, in Zone 1 and Zone 2).

3.1.1 Infrastructure corridor realignments and refinements

The infrastructure corridor (generally 18 m wide) between the Project mine site and the existing Murrawombie Copper Mine, is proposed to contain the site access/haul route and buried services (including water pipeline, optic fibre cable and an electrical conduit). The route is planned to join an existing approved haul road south of Murrawombie Copper Mine. The route from the Project mine site to the Mitchell Highway is generally aligned to utilise existing roads, minimise remnant vegetation clearing, and minimise impacts on landholder properties and their operations.

3.1.2 Co-locating an underground electrical conduit in the infrastructure corridor

An electrical conduit to support future potential underground electrical connection, is now proposed to be collocated within the infrastructure corridor proposed within the EIS; to be constructed between Murrawombie and the Constellation Project site. The proposed conduit would be located within the existing disturbance footprint, as assessed within the EIS. The conduit will be buried in a trench adjacent to the road (Figure 2). The conduit is also designed to be located under the Mitchell Highway.

The proposed electrical conduit is required to:

- enable a potential alternative power source for the mine site construction and operating activities, that could be utilised prior to constructing the solar power supply on site (should electrical grid connection become available);
- improve future potential power reliability for mining activities; and
- supporting Project activities to commence on the mine site as soon as feasibly possible.

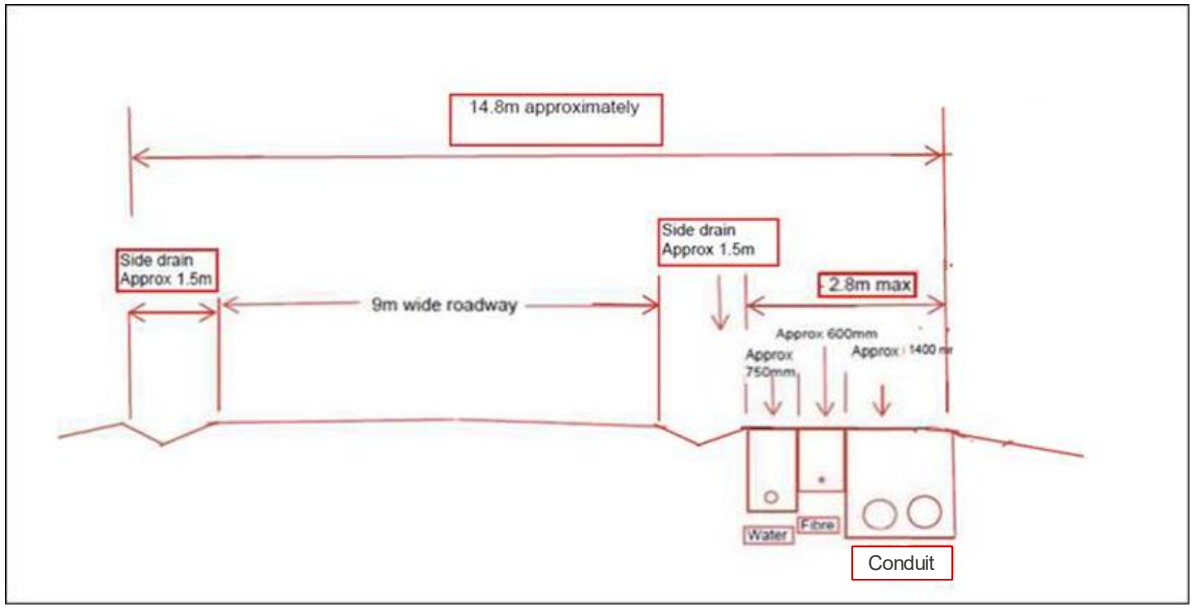


Figure 2: Indicative infrastructure corridor

3.1.3 Realigning the infrastructure corridor around the crown land lot 10DP48604

As per the EIS Chapter 1 Introduction, Section 1.5.3.2 'Registered covenants and Crown Land', and Figure 1-4, Aeris had previously proposed the infrastructure corridor route to traverse the northern boundary of Lot 10 of DP48604, being an unformed Crown Road that provides access to Reserve 46529, for Trigonometrical purposes (Lot 9 DP 48604).

Aeris has since continued engagement with NSW Crown Lands however, regarding the location of the infrastructure corridor, to ensure their interests are satisfied in respect to the final proposed location. As an outcome of these discussions, the Project is now proposing to relocate the section of infrastructure corridor to the north of Lot 10 of DP48604, thus avoiding impacts to Crown Land (Figure 3). The proposed realignment at this location is approximately 500 metres long and will require clearing of a small area of additional remnant vegetation (approximately 0.29 ha).

The reasons for this realignment are to:

- separate the direct impact of the infrastructure corridor containing the haul route, on the Crown Land lot;
- safely accommodate road-registered trucks, sized up to AB triples with 70 t payloads, by ensuring the road is adequately designed for those vehicles;;and
- support improved timings for Project construction commencing (by simplifying approval processes and minimising stakeholder concerns).

It is noted that this minor increase in impacts to remnant vegetation is also currently being reconsidered in respect to the operations of the Commonwealth's EPBC Act (potential impacts to matters of national environmental significance). This process will occur in parallel to this NSW approval process.



Figure 3: Infrastructure corridor realignment to avoid lot 10 DP48604

3.1.4 Realign the infrastructure corridor on lots 19DP751311, 13DP751311 and 2DP1296861

The EIS, Chapter 3 Project description, Section 3.9.1.2 'Construction site access and haul road', outlined the requirement for a new 2,850 m section of road (and pipeline in the infrastructure corridor) to be constructed between the Okeh Road and the Mitchell Highway intersection on the Mitchell Highway (EIS Chapter 3, Figure 3-8). The alignment of that new section of infrastructure corridor is approximately 800 m north of Girilambone, and the location was selected to avoid the town of Girilambone and potential direct impacts.

For the EIS, Aeris engaged with relevant stakeholders during the design phase and addressed potential community concerns relating to haulage trucks travelling through Girilambone township by proposing the new section of road to be developed north of Girilambone township. As such, the Project impacts from noise, dust, traffic and visual amenities would be significantly reduced for Girilambone residents. This was a higher cost option than hauling through Girilambone; however, it was adopted in response to community engagement regarding the Project.

Following ongoing engagement with landholders, and detailed engineering design works, a minor design change is now proposed to this section of road alignment (Figure 4). The reason for this minor realignment is to:

- minimise potential impacts of the proposed corridor to the landowner of Lot 13 of DP751311; and
- enable the road to safely accommodate road-registered trucks, sized up to AB triples with 70 t payloads, by ensuring the road is adequately designed for those vehicles.

The location of the realignment is approximately 1700 metres from the town of Girilambone (Figure 4).

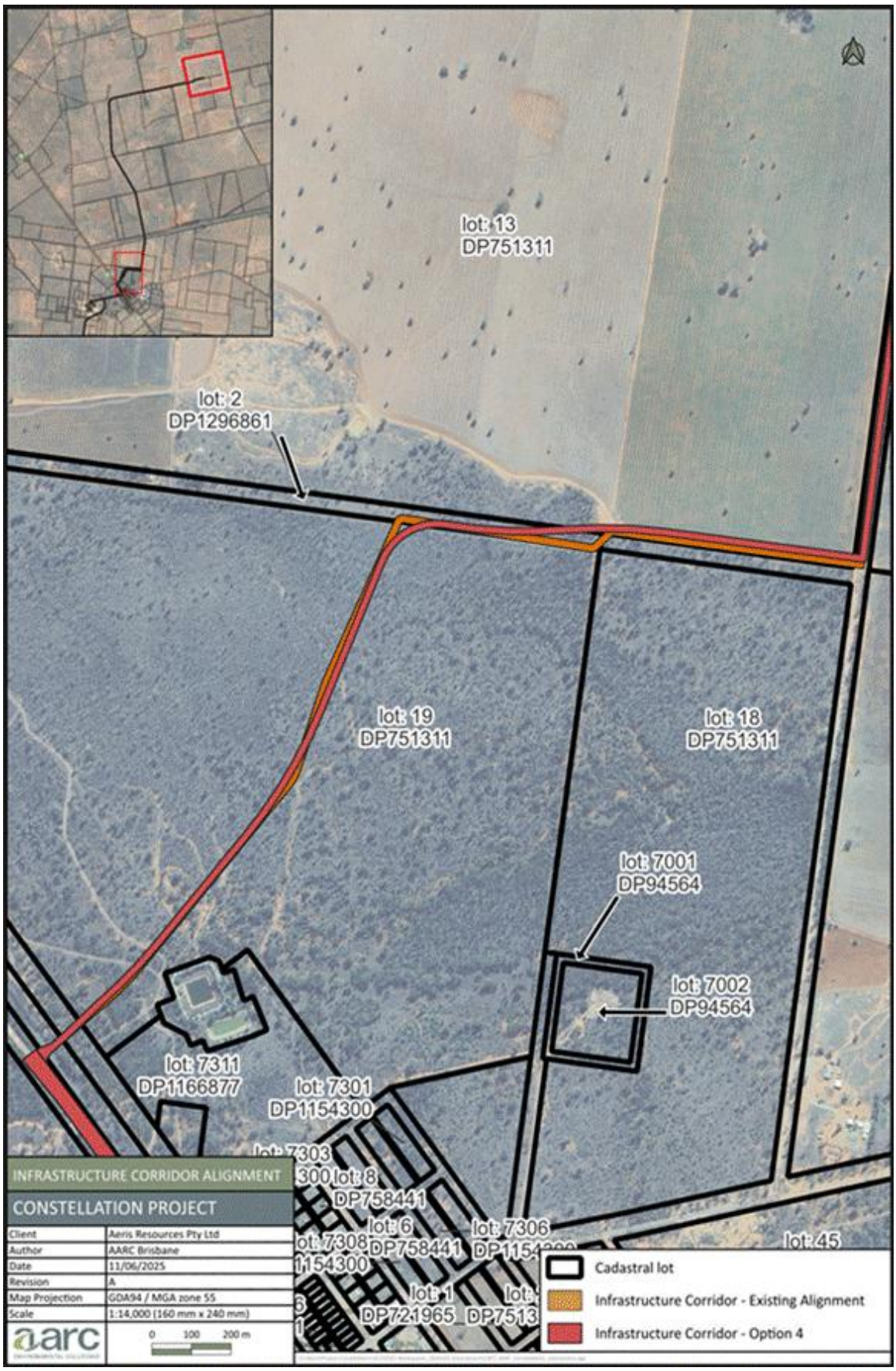


Figure 4: Infrastructure realignment on Lot 13 DP751311, Lot 2 DP1296861, and Lot 19 DP 751311

3.1.5 Minor areas of disturbance for the road within the infrastructure corridor, where they intersect with the Mitchell Highway

The original proposed infrastructure corridor from the Project site to the Tritton Copper Mine, included a new T intersection to link the proposed infrastructure corridor with the eastern side of the Mitchell Highway (north of Girilambone) and an upgrade to the intersection of the Mitchell Highway with Railway Road (west of Girilambone). The extent of the disturbance associated with the original proposed infrastructure corridor is described in detail in EIS Chapter 3, Section 3.4.4.

This refinement requires a very minor change to the original proposed infrastructure corridor (approximately 0.02 ha per intersection (0.04 ha total) in the Project footprint, with the purpose of enabling truck turning areas for each intersection with the Mitchell Highway intersections (Figure 5, Figure 6). The intersections between the proposed infrastructure corridor and the Mithell highway, including Channelised Right Hand Turns and sweep paths, have been redesigned to provide flexibility based on engineering designs ahead of formalisation of detailed designs.

The reasons for the proposed intersections refinements are to:

- comply with the Austroads Guidelines to Road Design and recommendations from Transport for NSW.
- Updating road designs to include improvements to road curves to accommodate road-registered trucks, sized up to AB triples with payloads of up to 70 tonnes, traveling at a speed of 20- 30 km.
- Follow engineering recommendations and the Austroads Guide to Road Design Part 3: Geometric design (Fanning, 2021), proper geometric design – including lane widths, curves and sight distances – to ensure that the proposed infrastructure corridor is safe by:
    - allowing vehicles to navigate turns safely at appropriate speeds;
    - providing sufficient stopping sight distance; and
    - reducing the likelihood of run-off and head-on crashes.

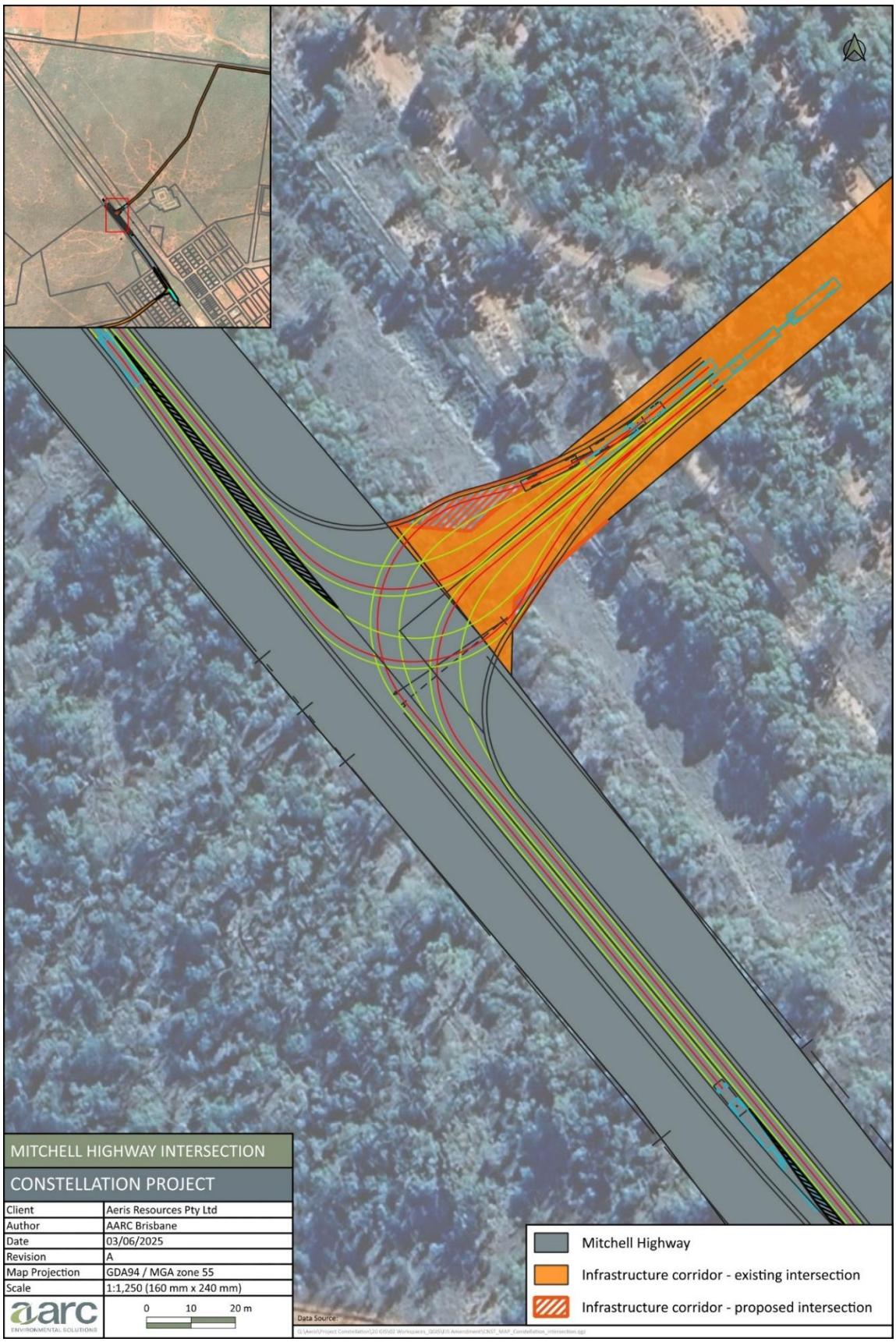


Figure 5: Intersection refinement — eastern side of Mitchell highway

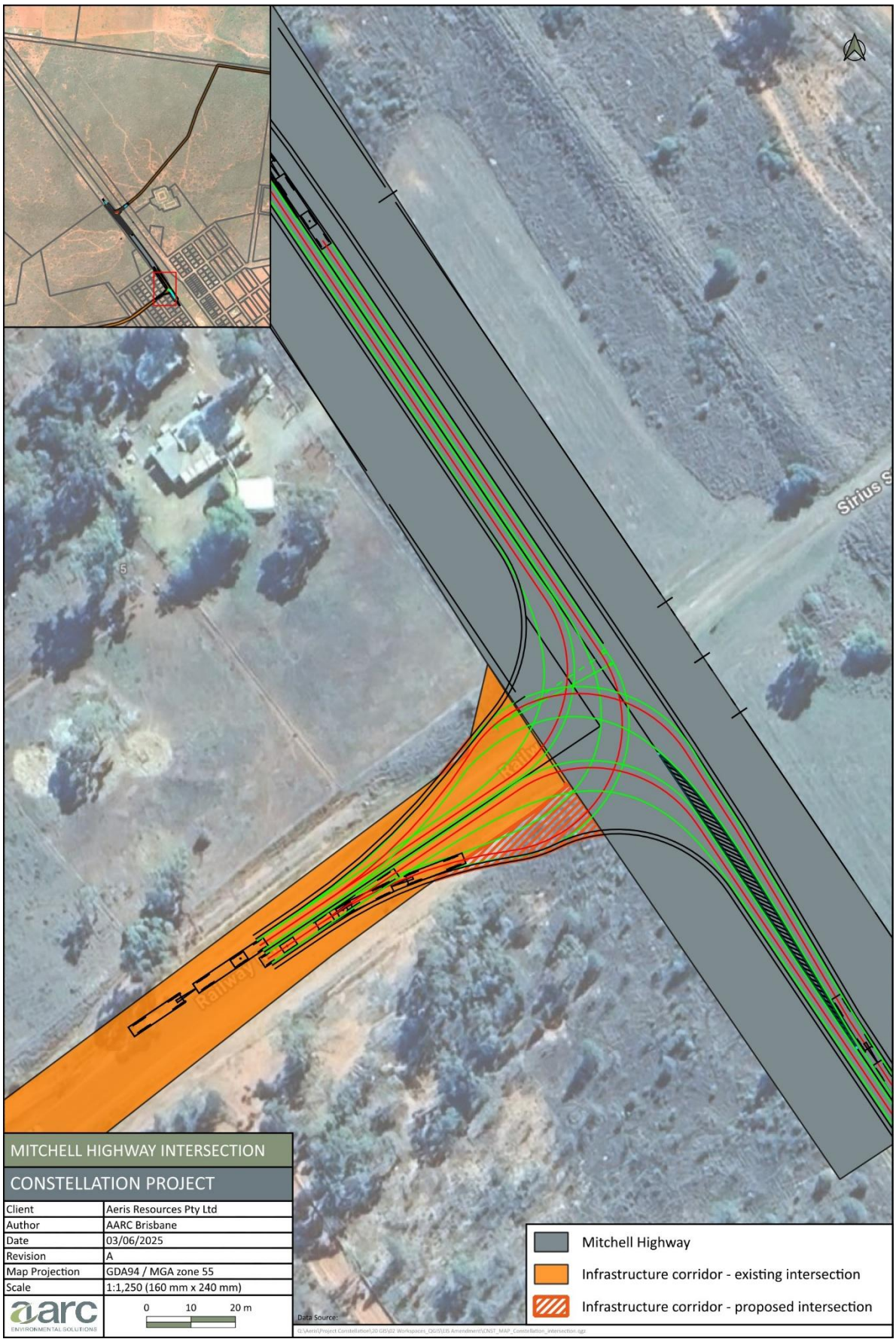


Figure 6: Intersection refinement — Mitchell Highway and Railway Road

3.2 Revising the construction operation hours to 24 hours per day, seven days a week

The EIS project description proposed surface construction activities to generally be undertaken during the hours of 6 am to 10 pm, seven days a week.

The activities to be undertaken during the construction stage of the Project include developing:

- the mine site, including site preparation, clearing and grading and earthworks for all pads, including the mining infrastructure area and surface infrastructure (EIS Chapter 3, Section 3.9.1.1);
- the 2,850 m section of the new road for site access to bypass Girilambone town and upgrading existing roads in the infrastructure corridor (EIS Chapter 3, Section 3.9.1.2);
- the underground water supply pipeline and optic fibre line between the Project mine site and the Murrawombie Copper Mine, within the infrastructure corridor (EIS Chapter 3, 3.9.1.2);
- water management infrastructure, including clean water diversions, dirty water diversions and water storage facilities and pipelines (EIS Chapter 3, Section 3.8.4);
- buildings and installing the heap leach facilities, paste plant, stockpile area and the other site facilities, such as offices and emergency facilities, laydowns, solar farm and power station, explosives storage area identified in EIS Chapter 3, Section 3.7; and
- the box cut and portal to enable mining development, then the decline and underground workings, the underground ventilation system and underground mining infrastructure (EIS Chapter 3, Section 3.6).

Aeris now seek to amend the proposed construction hours to 24 hours per day, seven days a week. An extension to the construction work hours for the Project is being sought to:

- enable construction of the Project, including constructing the new haul road and installing the infrastructure corridor, when traffic is minimised at night, and not coinciding with peak traffic periods;
- enable construction of the haul road in specific areas (see Section 6.7.2) to potentially reduce the overall duration of construction by 30 -40 %;
- to best manage unpredictable, inclement weather, ensuring mitigations can be implemented as soon as possible once suitable weather conditions permit;
- to provide flexibility for alternate workforce availability, if access to certain areas is restricted due to unforeseen circumstances;
- to respond to changes in production schedules, including accelerated timelines driven by first production ore demands; and
- to address a combination of these factors, or other project-driven requirements, that may arise.

4 Statutory context

Under the Environmental Planning Assessment Regulation 2021 (EP&A Regulation), the applicant for an SSD project may – with the agreement of the consent authority – seek to amend or vary an application at any time before it is determined (Department of Planning and Environment (DPIE), 2022). To seek the consent authority's agreement for any proposed amendments to an SSD application, the applicant must lodge an application and amendment report on the NSW Major Projects website.

This amendment report has been prepared in accordance with the 2022 NSW State significant development guidelines - preparing an amendment report (Appendix D) to the state significant development guidelines ((Department of Planning and Environment (DPIE), 2022).

As per the guideline (DPIE 2022), this amendment report has been prepared to enable the Department to assess the economic, environmental, and social impacts of the proposed changes. It is understood that the department (DPHI) will publish the amendment report on the NSW Major Projects website. Once it is made available, the report will provide the community an opportunity to read the amendment report and make a submission on the merits of the amended project. The level of information is required to be as comprehensive as possible, to enable stakeholders to make informed submissions.

Statutory context for the Project was provided in Chapter 5 of the EIS.

5 Community engagement

Aeris is committed to engaging with the community during the planning, construction, operation and decommissioning phases of the Project. This approach is consistent with community and stakeholder engagement that continues to be undertaken for Tritton Copper Operations.

Two broad stakeholder's groups were identified for the Project: being government stakeholders and community stakeholders. The potential interests in the Project for these identified groups, are described in Chapter 4 – 'Engagement' of the submitted EIS.

As part of the Social Impact Assessment a Consultation and Engagement Plan was developed at the outset of the Project, to guide effective, inclusive, and meaningful consultation.

Since the EIS submission, Aeris has continued to engage with government and community stakeholders, with this to continue following any approval of the Project. This ongoing engagement aims to provide opportunities for interested or affected parties to voice their concerns, offer feedback, and identify ways to support the Project's success.

5.1 Engagement related to the proposed amendments

Since the conclusion of the EIS public exhibition, Aeris have continued communicating with the community, including the following stakeholders:

- the landowner of 'Okeh'property (Lot 4 of DP751341), which is the property affected by a section of the proposed haul route and portion of the Project area;
- the landowner of 'Windella' property (Lot 10 of DP751321) which is the property affected by a portion of the Project area;
- the landowner of 'Glendale' property (Lot 13 of DP 751311), which is the property affected by a section of the proposed haul road;
- the landowner of 'Karingal' property, which is a property along a section of the proposed haul road;
- the landowner of 'Einalla' property, which is a property along a section of the proposed haul road;
- both landowners of the properties on the corners of Murrawombie Road and the Mitchell Highway;
- the Girilambone Community, including at a public community meeting to update them on the status of the project;
- representatives of Bogan Shire Council, in relation to the proposed haul road;
- representatives of Aboriginal Parties through the Tritton Community Consultative Committee;
- the NNWW Aboriginal Corporation RNTBC; and
- relevant landholders, whose properties have aboriginal cultural heritage sites.

5.2 Landholders

Since September 2024, several meetings have occurred with the landholder of 'Glendale', to discuss options for the haulage road alignment and potential agreement and/or land purchase to access the haulage road. To inform the discussion, further information was prepared for these meetings, such as a detailed map of the different sections of the proposed haul road.

The proposed amendment to the infrastructure corridor alignment on Lots 19 of DP 751311, Lot 13 of DP 751311 and Lot 2 of DP 1296861 (section 3), has been communicated with the landholder, and they are agreeable to the change proposed to the alignment of the infrastructure corridor, in that location as well as informed and amenable to 24 hrs a day seven days a week construction on the haul road and Project site.

5.3 Girilambone community

A public community meeting was held at the 'Hog and Billy Hotel' at Girilambone, on Wednesday 6th August, at 5pm. The Aeris project team provided a summary of the Project to date, and then outlined the proposed amendments. Those in attendance were engaged, asking questions and seeking clarification regarding the amendments. The community were generally accepting of these changes, and no objections were voiced at the meeting.

Representatives from Bogan Shire Council were invited to attend, however apologies were received.

5.4 The Community Consultative Committee (CCC)

Since the EIS submission, the Tritton CCC have met on 11 September 2024, and 11 December 2024, 19th March 2025 and 4th June 2025, here updates on the status of the Project as well as the proposed amendments to the EIS, were provided.

5.5 The Representative of Aboriginal Parties (RAP) and ACH landholders

Since December 2024, 'Niche Environment & Heritage' have communicated regularly with the members of the RAP regarding Aboriginal cultural heritage fieldwork programs and post fieldwork, the RAPs were provided with an updates on the ACHAR by Niche, on behalf of Aeris. On 24 June 2025, Niche provided a copy of the ACHAR for their review.

Landholders, whose properties have ACH sites have been notified and consulted by Aeris.

5.6 Government agency consultation

Government agencies who have been consulted regarding the amendments being sought, are outlined in Table 3.

Table 3: Government agency consultation records

Date	Government agency	Form	Topic
11/9/2024	Bogan Shire Council (BSC)	Meeting	BSC also attended the CCC meetings
11/12/2024	BSC	Meeting	BSC attended CCC meeting
19/3/2025	BSC	Meeting	BSC attended CCC meeting
4/4/2025	BSC	Meeting	BSC attended CCC meeting
16/6/2025	DPHI	Meeting	Proposed amendments and received feedback on each aspect provided
3/7/2025	Environment NSW – CPHR Group (DCCEEW)	Meeting	Requirements for revising the BDAR for the proposed amendments
21/7/2025	BSC – Director of Infrastructure and Services	Teams Meeting	Proposed amendments (haul route realignments, 24hrs construction and buried electrical conduit in services corridor)

Date	Government agency	Form	Topic
5/8/2025	BSC – Director Infrastructure and Services	In person meeting	Proposed amendments (haul road realignments and 24hrs construction as per the Community Consultation presentation)
7/8/2025	DPHI	Teams meeting	Proposed Amendments, focus on 24 hrs construction in zones

6 Assessment of Impacts

The following sections include summaries of the findings from the assessments regarding the impacts of the proposed amendments. An updated table of proposed mitigation measures for the amended project is provided as Appendix C, along with detailed technical reports (Appendix D).

6.1 Soil and land capability

6.1.1 Existing environment

An assessment of the Project area on Lot 13 of DP 751311, Lot 19 of DP 751311, and Lot 2 of DP 1296861 was undertaken (AARC 2025a), being the only area not considered in the Constellation Project Land and Soil Capability Assessment (AARC 2024b). A desktop assessment was conducted to evaluate the proposed realignment of infrastructure. This assessment confirmed that the land characteristics observed in the adjacent field survey for the realignment footprint are consistent with those mapped by the government.

The AARC (2024) field survey identified the majority of the Study Area as Kandosols (64.5%) with some Rudosols (16.6%). Kandosols were distributed on gently inclined or level landforms across the majority of the Study Area, while Rudosols were associated with stony hills within the Study Area. The soil types were classified into three soil management units (SMUs), namely Colluvial, Sandstone and Alluvial SMUs.

The realignment footprint is identified as part of the Sandstone Soil Management Unit (SMU) (AARC 2025a; Appendix D1). It has an apedal sandy loam soil texture throughout and classified as a Brown Rudosol. The land capability class of the Sandstone SMU applies to the realignment footprint, designating it as Class 7 with very low capability. Importantly, any impacts from the haul road construction and proposed realignment, are expected to be minimal.

Following mining, the intention for mine closure and rehabilitation is to reinstate pre-mining native woodland vegetation communities on most of the Project area. Post-mining land uses will therefore be compatible with the surrounding land use of grazing native vegetation.

6.1.2 Potential impacts to soil and land

As indicated by the Land and Soil Capability Assessment, the proposed amendments to the Project are not expected to have a significant impact on soil properties, land capability or land suitability. Any impacts will be managed by implementing the Project's Erosion and Sedimentation Control Plan (ESCP) to reduce risk of erosional impacts.

6.1.3 Proposed mitigation and management measures

The mitigation and management measures that would be adopted for the proposed amendments would be the same as those proposed to mitigate the potential impacts of the Project on soil erosion, soil attributes, agriculture and surrounding land uses. This is consistent with the Project EIS.

6.2 Geotechnical

A detailed Geotechnical and subsidence assessment was completed as part of the EIS (PSM 2024), addressing the relevant geotechnical aspects of the Secretary's Environmental Assessment Requirements (SEARs). A summary of the key findings of the assessment is provided in Chapter 6, Section 6.2 and Appendix 1 of the submitted EIS. The proposed amendment will have no impact on potential subsidence. No additional mitigations measures are therefore proposed to mitigate potential impacts of the Project on subsidence.

6.3 Geochemistry

The proposed amendment will have no change to impacts from potential mining materials. No additional mitigations measures are therefore proposed to mitigate potential impacts of the Project on subsidence.

6.4 Water

6.4.1 Potential impacts to groundwater values

The road realignment and installation of underground services in the infrastructure corridor are not anticipated to intercept groundwater. This is based on the minimal depth of trenching, in comparison to groundwater depths in the vicinity of the Project being greater than 10 m below the surface at monitoring bore locations (GHD 2024). There are no other elements of the proposal that would alter the groundwater modelling results or impact the EIS assessment completed by GHD (2024).

6.4.2 Potential change in catchments

The road realignment and installation of underground services in the infrastructure corridor will result in negligible change in surface water catchment area approaching the access road. Shifting the access road slightly north and south of the existing road alignment will result in negligible impacts to the catchment area impacting the access road. Therefore, it is anticipated that impacts to hydrology flow regimes due to the minor alteration of the road alignment will be indiscernible, or consistent with what has already been assessed through the Project EIS.

6.4.3 Potential impacts to surface water

There are no material changes to the Project that may otherwise generate new potential pollutants. In addition, no change to the construction methodology is proposed. Therefore, no changes to the potential water quality impacts and proposed surface water quality monitoring program for the Project are required.

6.4.4 Potential impacts to flooding

A qualitative assessment was provided by GHD (2025) to assess the flooding impacts that may occur from the proposed changes.

The potential flooding impacts of the Project site and the infrastructure corridor were assessed from the results of the flood modelling. Potential flooding impacts arising from the Project relate to changes in extent, inundation and an increase in potential velocity and scour. As per the findings in GHD (2025), it was identified that existing road access, and the proposed access road will incur minimal changes to the existing flood characteristics.

The realignment of the proposed access road will retain the characteristics of the current EIS conditions. The modified access road alignment is therefore anticipated to:

- Retain the alignment characteristics of the current road alignment.
- Replicate the surface levels of the current road design. Therefore, allowing flood water to overtop the road alignment in greater flood events and not induce additional upstream or downstream flood height changes from the existing designed road alignment that informed the flood assessment in GHD (2025).

Based on the above, it is anticipated the modified road alignment will have a negligible impact on the flood modelling outcomes presented within the EIS.

6.4.5 Site water management

The alteration of the access road alignment and construction hours are not anticipated to alter site water management requirements. No changes to the proposed construction methodology or operational

requirements are proposed. Therefore, no change to site water management requirements presented in the Constellation Project Water Impact Assessment (GHD 2024) is required.

The proposed Project amendments are not anticipated to alter the site water balance modelling findings presented in the Constellation Project Water Impact Assessment (GHD 2024).

The proposed amendments of altering construction hours and minor road realignment in two segments of the proposed access road are unlikely to alter the water demands associated with construction of the Project. Based on these minor alterations, it is anticipated that there will be negligible impact to the reported site water balance.

No additional water management infrastructure is proposed to cater for the proposed amendments. It is anticipated that all construction works will be undertaken in accordance with Managing Urban Stormwater: Soils and Construction – Volume 2C Unsealed Roads (DECC 2008).

6.4.6 Water licensing

No changes to the previously assessed water licensing requirements due to the proposed Project amendments are anticipated to be required.

6.4.7 Proposed mitigation and management measures

The new section of haul road to the east of the Mitchell Highway has been designed to be maintained following inundation events. This maintenance will be commensurate with other trafficked, unsealed mining access roads following inundation with rainfall or floodwaters.

The design of the access road is predicted not to significantly alter flooding behaviour (within the assessed events). There are no negative changes to the flood immunity of the Mitchell Highway identified as a result of the Project.

As the proposed amendments are expected to have a negligible impact on flood outcomes, surface water quality, or groundwater, as proposed in the EIS, no further mitigation to what was included in the EIS is required.

6.5 Biodiversity

6.5.1 Description of values

The biodiversity development assessment report (BDAR) was prepared by an accredited assessor, in accordance with the biodiversity assessment method (BAM), to assess the impacts of the Project on biodiversity values. The survey effort consisted of a desktop assessment, seven field surveys between 2022 and 2023, and 3 field surveys in May 2025 to support the revised BDAR for the proposed amendments (Ecoplanning 2025; Appendix D4).

Floristic vegetation surveys were conducted to identify field-validated plant community types (PCTs) and targeted surveys were conducted for relevant threatened species. Based on the surveys, and the amended infrastructure corridor, the subject land (Project area) is vegetated with two native vegetation communities (Ecoplanning 2025):

- PCT 103 – Poplar Box – Gum Coolabah – White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion (with 97.48 ha proposed to be impacted by the Project); and
- PCT 105 – Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion (with 0.05 ha proposed to be impacted by the Project).

The proposed amendments to the Project represent an additional impact to 0.33 ha of PCT103 (which is included within the above area of 97.48 ha) and a reduction of 0.04 on the impact of PCT105 (which is

included within the above area of 0.05 ha), the total additional impact equals to 0.29 ha. There has otherwise been no change to the impacted PCTs for the Project.

No *Biodiversity Conservation Act* or *Environment Protection and Biodiversity Conservation Act* listed Threatened Ecological Communities or threatened flora species were found within the Project amendment areas.

The BAM calculator generated 20 candidate species credit species predicted to occur on the subject land. Of the twenty candidate species credit species predicted to occur, 12 have been retained, with the rest not considered to have suitable habitat on the subject land in accordance with section 5.2.2 of the BAM. Of these species, potential suitable habitat Barking Owl (PCT 103 woodland and open woodland, and 105 intact) and Masked Owl (PCT 105 intact) was assumed present where survey was not conducted (Ecoplanning 2025; Appendix D4)).

Four threatened fauna species were opportunistically recorded in the Project area during the May 2025 field surveys (Ecoplanning 2025), being the:

- Pink Cockatoo (*Lophochroa leadbeateri*);
- Spotted Harrier (*Circus assimilis*);
- Southern Whiteface (*Aphelocephala leucopsis leucopsis*); and
- Grey-crowned Babbler (*Pomatostomus temporalis temporalis*).

The Pink Cockatoo is recognised as a candidate species credit species for PCTs found within the study area. The Pink Cockatoo is a candidate species credit species for breeding habitat only. Therefore, only impacts to known breeding habitat represent a species credit. The proposed Project changes will therefore increase the disturbance to habitat for the species to 10.11 ha (an increase of 0.66 ha). This area is composed of PCT 103 'Woodland' (8.40 ha) and 'Open woodland' (1.71 ha) vegetation zone and all areas of PCT 105 (Intact) (0.05 ha). These areas all contain potential habitat required for breeding (hollow bearing trees).

The Southern Whiteface, Spotted Harrier and grey-crowned Babbler are not candidate threatened fauna species and, therefore, do not require credit offsetting, nor targeted survey effort. Habitat offsetting for these species is encompassed in the retirement of ecosystem credits.

6.5.2 Potential impacts to biodiversity

The impacts associated with the infrastructure corridor were assessed as part of the overall impacts associated with the Project and presented within the EIS and updated Biodiversity Assessment Report (Ecoplanning 2024; 2025).

The project change requires an increase in impact to native vegetation of 0.29 ha. There has been no change to the PCTs for the Project area.

A number of route options were investigated, along with subtle modifications to the alignment, to identify the path that impacted the least number of hollow bearing trees in this area. There has however, been a change in the number of hollow bearing trees impacted by the proposed infrastructure corridor. A total of 48 hollow bearing trees will now be impacted by the project, being an increase from 27 for the previous alignment. Notwithstanding this, it is acknowledged that hundreds of HBTs will still remain adjacent to the subject land (Ecoplanning 2025 Appendix D4)

Removal of native vegetation will be offset as part of the project offset strategy, with ecosystem and species credits having been identified using the Biodiversity Assessment Method (DPIE 2020). Reasonable and practicable mitigation measures proposed in the EIS submission are also proposed (and remain applicable) to minimise potential impacts during all Project phases.

6.5.3 Proposed mitigation and management

The mitigation and management measures that would be adopted for the proposed amendments have been outlined in the updated BDAR (Ecoplanning 2025) and are generally the same as those proposed within the

EIS. One mitigation measure has been amended however (per Appendix C) to include salvaging of the habitat trees in the infrastructure corridor, options for salvaging and reuse of hollow bearing trees will be assessed based on the characteristics of trees cleared.

With the reassessment of impacts requiring offsets, according to the biodiversity assessment method, a total of 275 ecosystem credits (PCT103 Woodland- 237; PCT103 Open Woodland: 36; PCT 105 Intact: 2) and 247 species credits (*Ninox connivens* (Barking Owl): 244; *Tyto novaeholandiae* (Masked Owl): 3) are required (See Table 4). As established by the BAM credit, requirements have been calculated to achieve the 'no net loss standard'.

Table 4: Credit summary

PCT/ Species	Original submission Credits required (Ecoplanning 2024)	Credits required with proposed amendments (Ecoplanning 2025; Appendix D4)
PCT 103 Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion	257	273
PCT 105 Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion	2	2
Total ecosystem credits required	**259**	**275**
Ninox connivens (Barking Owl)	N/A	244
Tyto novaehollandiae (Masked Owl)	N/A	3
Total Species credits required	**0**	**247**

6.6 Air quality and greenhouse gas

6.6.1 Description of values

Air quality environmental values associated with the project have been described in detail in Section 6.8 of the EIS and in the air quality impact assessment completed by Todoroski Air Sciences Pty Ltd (Todoroski 2024). The submitted assessment found that emissions to air are expected to comply with all relevant criteria, at all sensitive receivers.

A greenhouse gas assessment was completed by AARC Environmental Solutions Pty Ltd (AARC 2024a) to assess the potential greenhouse gas impacts of the Project. This assessment was prepared in accordance with the NSW Planning Secretary's Environmental Assessment Requirements (SEARs) and the National Greenhouse and Energy Reporting framework.

To support an assessment of potential changes in air quality impacts as a result of the proposed Project amendments, an addendum to the Air Quality Impact Assessment Constellation project has been prepared (Todoroski 2025). This is provided as Appendix D5.

6.6.2 Potential impacts to air quality and greenhouse gas

The proposed amendments are not anticipated to generate any additional dust or air quality impacts, from what has been assessed in the original EIS. The realignments of the infrastructure corridor will primarily follow the existing alignment, with deviations of approximately 50 metres, which are considered to be

relatively minor. Given that the nearest residential areas are situated over 1 kilometre away from the realignment zones, these amendments are expected to have a negligible effect on air quality.

Construction activities along the infrastructure corridor will involve surface works to widen and prepare the area, trenching and minor excavation for the installation of the water pipeline and cable conduit, as well as general road surface upgrades.

The shift to 24-hour construction may reduce the potential for atmospheric dispersion of dust during night-time periods. While this may slightly increase the likelihood of dust-related impacts in areas immediately adjacent to the construction zone, the effect at more distant residential locations is expected to remain negligible.

Importantly, allowing construction to proceed during night hours will facilitate quicker completion of works, especially those along public roads and near residential receptors. This will effectively reduce the duration of construction impacts to receivers.

The proposed amendments are not anticipated to generate any additional greenhouse gas emissions. Greenhouse gas emissions were estimated for the project in accordance with the National Greenhouse and Energy Reporting framework. The predicted annual scope 1 and scope 2 emissions for the Project's peak emission year, represent approximately 0.01% of Australia's total emissions

6.6.3 Proposed mitigation and management

Emissions from the proposed activities are expected to be managed through the Construction Environmental Management Plan for the Project. Proposed mitigation measures are detailed through Appendix C.

Significant greenhouse gas mitigation measures have also been incorporated into the Project design and the Project is considered to provide an important contribution to economy scale emissions avoidance, by producing materials critical to global emissions avoidance. The proposed Project is therefore expected to be able to comply with applicable greenhouse gas regulations through the application of these proposed measures.

6.7 Noise and vibration

6.7.1 Description of values

A noise impact assessment was undertaken for the proposed Project as described in Chapter 6, section 6.9 of the EIS (Todoroski 2024), in accordance with the Noise Policy for Industry, the Interim Construction Noise Guideline and the NSW Road Noise Policy. The assessment considered potential noise impacts on sensitive receptors. A blasting impact assessment was also undertaken to assess potential impacts of blasting activities on sensitive receptors.

Modelling of a worst-case noise scenario was adopted to assess the potential impacts of the Project on sensitive receptors. This scenario assumed the maximum number of plant and equipment operating simultaneously at the site, under noise enhancing conditions. Noise impacts were considered for both construction and operational phases of the Project. Modelling results found that noise levels would be within applicable NSW noise criteria at all sensitive receptors. Notwithstanding this, noise mitigation and management measures have been proposed to ensure noise emissions are minimised where possible.

An addendum to the Noise Impact Assessment Constellation Project was also prepared to assess the potential impacts of the proposed amendments. This is provided as Appendix D5.

6.7.2 Potential impacts to noise and vibration

The proposed realignments of the infrastructure corridor are not expected to significantly deviate from the original alignment, and as such, they are anticipated to have negligible noise impacts on the nearest residential receptors (Todoroski 2025) from what has been assessed within the EIS.

The assessment of the proposed extension of construction hours to allow for 24-hour construction, however, indicates that several noise receptors, particularly those located in the township of Girilambone and one receptor (R1) near the infrastructure corridor, are expected to experience noise levels exceeding the applicable night time noise management level (RBL + 5 dB(A)) (Todoroski 2025). However, no receptors are predicted to be highly noise-affected, i.e. experience noise levels above 65db(A).

Mitigation measures focused on community engagement will be established to address potential impacts. The infrastructure corridor has been divided into four distinct zones as indicated in Figure 7. Constructions activities proposed to occur 24 hrs a day, seven days a week, will be restricted to Zones 1 and 2, which are located more than 2 km away from any sensitive receptor.

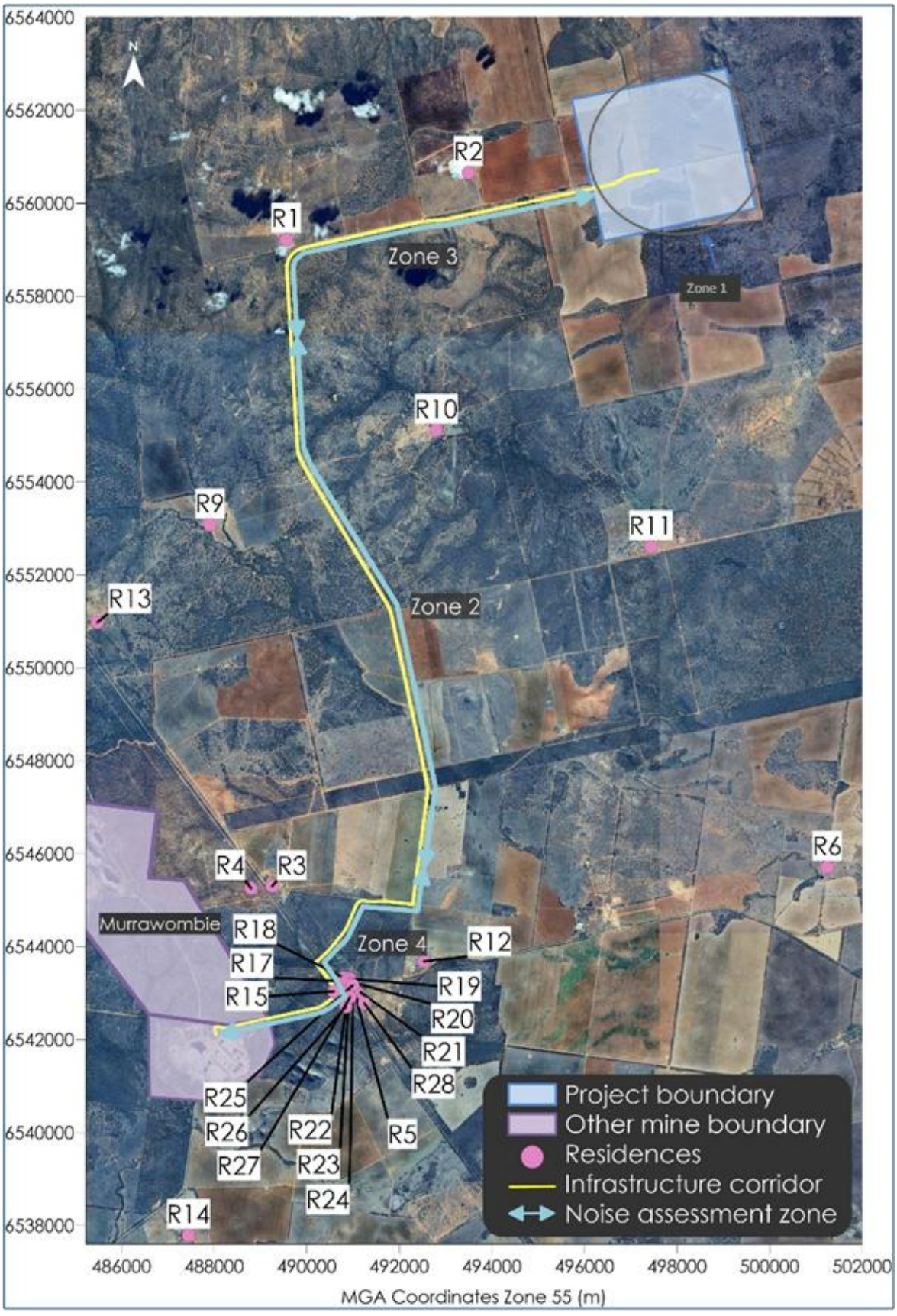


Figure 7: Haul road Zones

Impacts from construction activities will be transient during the construction phase of the project, with impacts to specific sensitive receptors estimated to be as follows:

- Zone 1: construction period of approximately 12 months (representing the approximate period up to mining commencement);
- Zone 2: construction period of 20 weeks duration, if 24 hrs per day seven days a week construction is allowed a reduction of 7-8 weeks can be expected;
- Zone 3: construction period 16-20 weeks duration, no 24 hrs construction activities are proposed,
- Zone 4: construction period 16-20 weeks duration, no 24 hrs construction activities are proposed.

6.7.3 Proposed mitigation and management

To address the potential impacts, a range of standard mitigation measures and additional mitigation measures have been identified. Proposed mitigation measures are detailed through Appendix C

Additional graduated mitigation measures include the following:

- <5dB(A) above the noise management level:
  - Notification as letterbox drop or equivalent, to provide advance warning of works and potential disruptions.
- >5 to 15dB(A) above the noise management level (additional to the above):
  - Verification of noise levels as part of routine checks or following reasonable complaints.
  - Duration Reduction, each of the impacted receptors should be visited to discuss the project to gain support for a Duration Reduction so that the project can be completed more quickly.
- >15 to 25dB(A) above the noise management level (additional to the above):
  - Phone Calls detailing relevant information made to impacted receptors within seven calendar days of proposed work.
  - Specific Notification letterbox dropped (or equivalent) to impacted receptors no later than seven calendar days ahead of construction activities that are likely to exceed the noise objectives.
  - Individual Briefings by project representatives at least 48 hours ahead of potentially disturbing construction activities.
- >25dB(A) above the noise management level (additional to the above):
  - Individual Meetings to consult with the receptor(s) about the impacts of high noise activities and agree on mitigation measures to be implemented to alleviate the potential impact.

The Project's Construction Environmental Management Plan (CEMP) will be updated, incorporating the final construction methods, equipment, and schedule. The CEMP will ensure that appropriate mitigation and consultation strategies are implemented to effectively manage potential noise impacts at sensitive receptor locations.

6.8 Non-mining waste

The proposed amendment will have no change to impacts from non-mining waste materials. No additional mitigations measures are therefore proposed.

6.9 Hazards and safety

6.9.1 Description of values

Potential off-site risks posed by hazardous materials were assessed through a preliminary hazard assessment. The Preliminary Hazard Assessment (PHA) is described in detail in Section 6.11 of the EIS, the assessment followed the Multi-level Risk Assessment framework, evaluating potential risks to people, property and the environment.

The proposed amendment will have no change to the proposed management of hazards and assessment of the potential risk related to hazardous materials used on-site with regard to public safety. Therefore, no additional mitigations measures for the identified risks are required by the proposed amendments.

6.10 Heritage

6.10.1 Description of values

An Aboriginal cultural heritage assessment was undertaken for the proposed Project, in accordance with NSW statutory processes and guidelines. The assessment was conducted in cooperation with registered Aboriginal parties, to identify Aboriginal cultural heritage values.

Searches of the Aboriginal Heritage Information Management System were undertaken in 2021, 2023 and 2024, with no recorded Aboriginal heritage sites identified within the Project site. An archaeological field survey of the Project area was also undertaken, identifying 45 new Aboriginal cultural heritage sites. Sites identified were predominantly scarred trees, with five sites identified as potential archaeological deposits requiring further subsurface testing.

Potential direct and indirect harm to the identified Aboriginal cultural heritage sites were assessed. The management hierarchy for the conservation principles was used to refine the Project layout, and subsequently avoid impacting 35 sites. A total of 11 sites are therefore now predicted to be impacted by the proposed Project, including five sites expected to be totally impacted and six expected to be partially impacted. Impacted sites are considered to have low or moderate scientific significance, low aesthetic significance, and low historical significance. Further archaeological testing and salvage in consultation with Aboriginal parties is proposed for impacted sites.

In addition to the potential salvage of impacted sites, management commitments include the establishment of ‘no go zones’, ongoing consultation with local Aboriginal parties, development of an Aboriginal Heritage Management Plan, subsurface testing of potential archaeological deposits, and temporary fencing installation.

6.10.1.1 Historical heritage

A historical heritage assessment was also undertaken for the proposed Project. No listed heritage sites were identified to exist within the Project impact area, from searches of national, state, and local heritage registers.

Site inspections were also conducted of the Project site and infrastructure corridor route. Site inspections identified two moderate local significance sites in the vicinity of Girilambone, outside of the Project impact area. The historic heritage assessment therefore determined that the Project will not impact any significant heritage sites.

6.10.2 Potential impacts to cultural heritage

An addendum to the Aboriginal Cultural Heritage Assessment (ACHA) has been prepared to evaluate the potential impacts of the proposed amendments (Appendix D6). This desktop assessment was conducted to examine how these amendments may affect known Aboriginal cultural heritage sites and to suggest appropriate mitigation measures.

The following amendments to the works impact areas have been considered in the desktop assessment

- Amendment 1: Corridor realignment adjacent to Crown Land Lot 10 of DP 48604
- Amendment 2: Corridor realignment at Lot 19 of DP 751311, Lot 13 of DP 751311 and Lot 2 of DP 1296861
- Amendment 3: Inclusion of underground electrical conduit.

6.10.2.1 Infrastructure corridor realignment crown land lot 10DP48604

A review comparing the amended alignment with the existing alignment (Figure 8) found that the proposed changes will:

- have a positive outcome by eliminating both direct and indirect impacts on two AHIMS sites: Okeh 5 (#26-3-0196) and Okeh Scar Tree 8 (#26-3-0190); and
- result in a direct impact, including total loss of cultural value, to Okeh Scar Tree 9 (#26-3-0189), as it is located within the amended alignment (Niche 2025; Appendix D6).

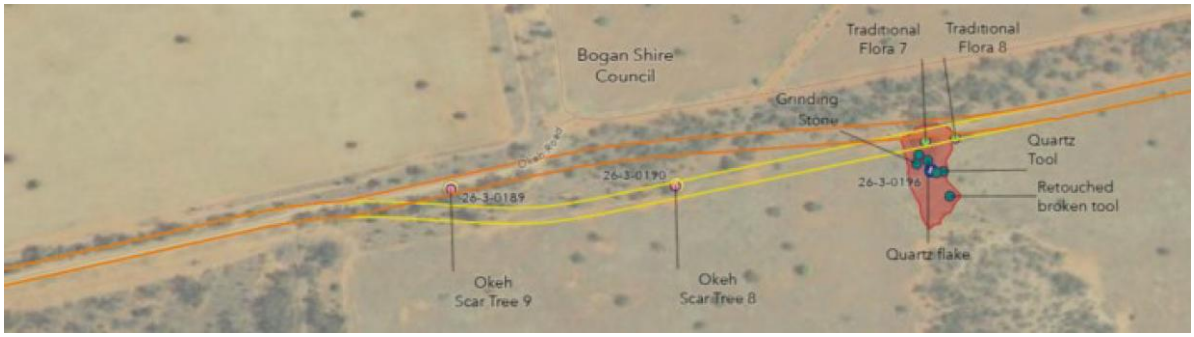


Figure 8: Aboriginal cultural heritage sites within the vicinity of the proposed amendment (orange)

6.10.2.2 Infrastructure corridor realignment of Lot 19 DP751311, Lot 13 DP751311 and Lot 2 DP1296861

The updated assessment (Niche 2025b) identified that no Aboriginal object(s) or place(s) are located within the boundary of the alignment, with one AHIMS site, Okeh Midden 1 (AHIMS# 26-3-0226), located approximately 90m southeast of the alignment. The proposed new alignment will therefore have no direct or indirect impact on the AHIMS site (Figure 9).



Figure 9: Aboriginal cultural heritage sites within the vicinity of the proposed amendment (orange)

6.10.2.3 Inclusion of underground powerline conduit

The assessment (Niche 2025) identified that no Aboriginal object(s) or place(s) are located within the proposed areas of amendment. The amendment will therefore have no direct or indirect impact on Aboriginal cultural heritage values.

6.10.3 Proposed mitigation and management

General considerations of management and mitigation strategies for the Project are detailed in Section 10 of the ACHA (Niche, 2025). The following management and mitigation strategies specific for the Amendments are provided by the addendum (Niche 2025):

- Okeh 8 Scar Tree site (located approximately 35 m south of the amended alignment) must be identified as “no go zone” on all construction and management plans.
- A salvage of Okeh Scar Tree 9 should be undertaken to mitigate harm in accordance with an AHMP.
- Provision should be made to return Aboriginal objects to RAPs entitled to, and willing to accept possession, custody or control of the Aboriginal object in accordance with Aboriginal tradition.

6.11 Social

6.11.1 Description of values

A Social Impact Assessment (SIA) was completed for the proposed Project (TAP 2024) and described extensively in section 6.13 of the EIS. The assessment was prepared in consultation with Project stakeholders, identified through a scoping exercise. Project stakeholders were engaged through surveys, semi-structured interviews, online information sharing, community meetings, and information briefings.

The findings of the SIA indicate that the Project will yield a range of both positive and negative impacts (TAP 2024). Negative impacts are expected from the acquisition of freehold land, increased demand for housing in the local area, heightened traffic due to haul trucks, and potential health and wellbeing effects, particularly on the workforce and landowners.

Positive impacts predicted as a result of the project include a boost to the permanent population through the operations workforce, thereby enhancing community life. It will also contribute to social capital and community resilience while providing employment certainty and new job opportunities. Moreover, it is expected that the Project will support local businesses and generate tax revenue for the New South Wales economy.

And addendum report to the SIA was prepared (TAP 2025) to assess the potential impacts of the proposed amendments. This addendum report is provided as Appendix D7.

6.11.2 Potential impacts to social values

The addendum assessment report determined that the realignments for infrastructure do not result in any discernible change to social impacts. However, the proposed changes to construction operation hours will result in changes to social impacts relating to amenity, lifestyle and health.

The SIA Report (TAP 2024) identified 3 impacts relating to amenity, lifestyle and health (under worst case scenario conditions):

- The amenity of residents living near the Project (including the haul road) may be impacted by noise, vibration, dust which may affect their lifestyles e.g. willingness to use outdoor areas.
- Noise, vibration and dust impacts for residence close to the Project and haul road may cause irritation and decrease personal health.
- Some visual amenity (and lighting) impacts will occur to Sensitive Receptors located along the haul road.

Whilst these impacts are considered certain to occur under worst case scenario, they are considered to have a minor magnitude rating and an overall significance classified as medium.

With the proposed changes to extend construction hours to 24 hours, an additional social impact has therefore been added under the social impact category of Health and Wellbeing – Physical Health:

- Noise and vibration impact for residences close to the infrastructure corridor including ability to relax at home, night-time peacefulness and undisturbed sleep.

This additional impact has been assessed as negative, however, as stated in section 6.7.1, 24hrs a day seven days a week construction will be limited to Zone 1 and Zone 2 where there is a buffer to any sensitive receptors greater than 2 km and will only occur during the construction phase of the Project.

6.11.3 Proposed mitigation and management

Mitigation measures to reduce impacts to amenity, lifestyle and health due to dust and noise are addressed in sections 6.6.3 and 6.7.3 and included in Appendix C. Additional mitigation measures to address the social impact category of Health and Wellbeing – Physical Health are as follows (TAP 2025):

- Development of a Construction Environmental Management Plan.
- Undertake regular engagement with residential receptors.
- Clear communication channels shall be established between the Project proponent and those persons and organisations in the community potentially affected by the construction of the infrastructure corridor prior to construction works commencing.

Additionally, it is recommended that a complaint handling procedure be implemented and include the following:

- A dedicated phone line for community concerns (already in place).
- A central point of contact.
- The register of complaints will be maintained, including time, date, location, person's contact details and any details regarding construction activities which are the focus of the complaint.
- Reporting procedures.

6.12 Economic

6.12.1 Description of values

An economic impact assessment was completed by AEC Group Pty Ltd (AEC 2024) to evaluate the beneficial and adverse impacts of the Project on local, regional, state and national environments.

The assessment utilised a local effects analysis based on regional catchment data, to determine economic impacts. Key findings of the economic impact assessment are summarised in Chapter 6, Section 6.14 of the EIS.

Economic impacts from the Project determined by the assessment include the following (AEC 2024):

- Positive impacts include a significant economic output both during the construction and operation phases of the Project, with notable contributions to the gross regional product and across the NSW state.
- Adverse impacts include impacts on agricultural productivity, greenhouse gas emissions, traffic generation, impacts on ecosystem services, impacts on local businesses through competition for resources, local property market impacts, and local infrastructure and service provision impacts.

In summary, the assessment concluded that any potential adverse economic effects are regarded as relatively minor. Furthermore, the overall economic impact of the project is anticipated to be predominantly positive.

An addendum to the economic impact assessment (AEC 2025) was prepared to evaluate the implications of the proposed amendments (Appendix D8). The addendum concluded that the proposed Project amendments do not represent a material change to the following aspects (AEC 2025):

- contribution to the economy;
- impacts to business;
- impacts on business from competition resources;
- impacts on agricultural productivity;
- impacts to government; and
- cost of greenhouse emissions

The updated assessment however, identified the following minor impacts from the proposed amendments (AEC 2025):

- changes in construction hours may result in periods of minor increase in demand for short-term accommodation;
- a minor reduction on cost of traffic generation due to a potential small decrease in the assessed cost of crashes; and
- a minor increase in costs related to ecosystem offsets is expected as a result of the amendments to the infrastructure corridor alignment.

Overall, the findings of the assessment (AEC 2025) indicate that while there are minor impacts resulting from the proposed amendments, they do not represent a significant change in the conclusions of the original economic impact assessment. As a result, no additional mitigation or management strategies are necessary.

6.13 Transport

6.13.1 Description of values

The traffic environment in the vicinity of the project is detailed in Chapter 6, Section 6.15 of the EIS. A Traffic Impact Assessment (TIA) was undertaken by Stantec Australia Pty Ltd (Stantec 2024) in accordance with relevant guidance documents from Transport for NSW, Roads and Traffic Authority, and Austroads.

Project-generated traffic will include the transport of ore, tailings, equipment and materials, as well as personnel movements. Project transportation will utilise existing roads (state and council-controlled) as far as practicable, with a new section of haul road proposed to avoid traffic traversing through Girilambone township (linking the Mitchell Highway and Okeh Road).

Additional traffic generated by the proposed Project is anticipated to have a very minor impact on the surrounding transport environment, as per the following findings of the transport impact assessment:

- Increases to traffic volumes (resultant of the Project) will be minor, with predicted peak traffic volumes (during the AM and PM peak periods) not expected to exceed a total of 36 vehicle movements.
- Impacts on intersection performance are expected to be indiscernible, with modelling demonstrating a Class A level of service across all intersections, across all Project phases.
- Impacts on road network performance are expected to be minor, with the modelled level of service predicted to be Class A, across all Project phases.
- There are no specific safety concerns with the existing road transport environment that would be exacerbated by the proposed mine.
- Safe intersection sight distances are achievable at both intersections of the Mitchell Highway.
- The turn warrant assessment undertaken indicates basic turn treatments are required for the two Mitchell Highway intersections.
    - Notwithstanding this, a channelised right-turn treatment has been adopted for Mitchell Highway/proposed haulage road intersection (exceeding assessment requirements).
    - A basic left turn treatment has been adopted for the Mitchell Highway/Railway Road intersection.

Stantec (2025) prepared an addendum letter to assess the proposed amendments from a traffic and transport perspective (Appendix D9). The findings indicate that these amendments are not expected to result in any additional traffic impacts beyond what was evaluated in the Constellation Project Traffic Impact Assessment (TIA) (Stantec, 2024). The extended construction hours will avoid peak traffic periods, ensuring the smooth operation of the surrounding road network. Furthermore, the extended construction hours would allow additional works to be undertaken during low traffic periods, reducing the traffic impacts of the Project. Given the minor nature of the changes, the proposal therefore remains supportable from a traffic and transport perspective (Stantec 2025).

6.14 Visual amenity

6.14.1 Description of values

The visual assessment undertaken by AARC (2024c) is described in Chapter 6, Section 6.16 of the EIS. The assessment was prepared to assess the potential impact on visual amenity from the Project site and haulage route. Methods utilised were adopted from relevant guidance documents. Landscape and visual impacts were evaluated based on the maximum visual impact (which included the assessment of mining operations occurring 24 hours per day, seven days a week), where all visible features are present at maximum extent and size.

A letter report was prepared by AARC (2025b) to provide an update to the previous Visual Impact Assessment and assess the change in visual impacts that may arise from the proposed amendments (Appendix D10). This report limits the assessment of impacts to consider the infrastructure realignment amendments and the minor change in the footprint of the Mitchell Highwall intersections (see 3.1.5). This scope was identified on the basis that inclusion of the underground electrical conduit (3.1.2) and the revision of construction hours to 24 hrs per day (section 3.2), seven days a week will not result in any change to the original report.

The report identified that overall, the proposed amendments will not significantly alter the visual impacts described in the EIS. Therefore, no additional mitigation and management measures are required.

7 Justification of the amended project (5 pages)

7.1 Project evaluation

A comprehensive evaluation process has been undertaken in collaboration with the NSW Government, through the Department of Regional NSW. Key objectives of this effort include effective communication of financial elements, streamlining resource extraction, and establishing a robust plan for rehabilitation and closure.

The evaluation involved formal sessions with the Mine Development Panel (MDP) and the Resource Economic Assessment (REA). These sessions, conducted on 20 March 2024, engaged multiple representatives from various NSW Government agencies, with no significant concerns identified. The discussions covered critical considerations such as resource allocation, mining methods, economic implications, and rehabilitation plans. Additionally, feedback collected during this engagement has been integrated into the Environmental Impact Statement (EIS) prior to its final submission.

Engagement with the Rehabilitation and Securities Assessment Panel (RASP) explored essential components of rehabilitation and closure. The discussions reaffirmed the Project's commitment to achieving successful rehabilitation, identifying suitable post-mining land uses, and mitigating rehabilitation barriers.

7.2 Economic justification

The demand for copper is projected to surge in the coming years, particularly driven by infrastructure development and the rise of electric vehicles. Acknowledged as a critical mineral under the NSW Government's strategy, the proposed Project will not only contribute to meeting this demand but will also yield significant economic benefits locally, regionally, and nationally.

The Project is expected to generate substantial economic outputs:

- Construction Phase: Anticipated economic output of approximately $144.7 million within the region and $136.6 million in flow-on effects within NSW, creating around 315 full-time equivalent (FTE) jobs in the region.
- Operational Phase: Projected annual economic output of $203.2 million within the region and an additional $122.1 million state-wide, supporting around 256 FTE jobs in the area.

Furthermore, the Project will bolster government revenues through taxes and royalties, advocating for the development of local infrastructure and services.

While the Project is poised to generate significant economic benefits, some potential adverse impacts have been noted. These include competition for labour resources, temporary disruption to agricultural land, and increased pressure on local housing and infrastructure. However, these impacts are expected to be manageable, primarily limited to the construction phase, and appropriate strategies will be implemented to mitigate any adverse effects.

7.3 Social justification

The Project is expected to enhance local community life through increased employment opportunities and contributions to local businesses. All negative impacts assessed can be reasonably mitigated with a coordinated approach involving the company and key local stakeholders.

A social impact management plan will be prepared and implemented to manage Project social impacts and benefits. The plan will include a program to monitor potential social impacts over the life of the Project and identify unanticipated Project impacts.

7.4 Environmental justification

Multiple assessments address impacts on land, water, and biodiversity, and significant commitments have been established to mitigate environmental effects as outlined in Chapter 1, section 1.5.3 of the EIS and the body of this document.

Aeris is dedicated to reducing greenhouse gas emissions through the implementation of sustainable practices, such as the construction of a solar-powered generation plant, demonstrating a commitment to ecological sustainability amidst mining operations.

Impacts on environmental values that require offsets have been minimised by adopting an iterative Project design process, which has enabled impact avoidance/ minimisation decisions to be made during the design of the Project.

7.5 Conclusion

While the proposed amendments to the Project are acknowledged to generate some minor increase in impacts to localised environmental values (as assessed in detail throughout this amendment report) the change in environmental impacts (from what has been presented within the Project EIS) are considered minor in nature.

Significant work has nonetheless been undertaken to assess the potential change in impacts to environmental values, as evidenced through Appendices to this report. Updated assessment findings have determined that the project will comply with all environmental assessment criteria and that mitigation measures identified in the EIS remain appropriate for the proposed Project.

Extensive stakeholder engagement has also occurred to support the proposed amendments to the Project, including ongoing engagement with landholders, community meetings, and local and State Government stakeholders. Aeris Resources maintains a commitment to continue this engagement throughout the Project lifecycle, with ongoing consultation and input from local stakeholders being considered.

8 References

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AARC 2025a, *CONSTELLATION PROJECT – LAND AND SOIL CAPABILITY ASSESSMENT – REALIGNING THE INFRASTRUCTURE CORRIDOR ASSOCIATED WITH LOT 13 DP751311, LOT 19 DP751311 AND LOT 2 DP1296861,* Letter prepared for Aeris Resources LTD, Brisbane Australia.

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Todoroski Air Sciences Pty Ltd (Todoroski) 2024, *Noise Impact Assessment Constellation Project,* prepared for Aeris Resources Limited, Eastwood, NSW 2012.

Todoroski Air Sciences Pty Ltd (Todoroski) 2025, *Constellation Project EIS Amendment – Air Quality and Noise,* prepared for Aeris Resources Limited, Eastwood, NSW 2012.

Appendix A: Updated project description

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CHAPTER 3 – PROJECT DESCRIPTION



3 Project description

3.1 Introduction

This chapter provides a detailed description of the Constellation development (the Project), in accordance with the State significant development guidelines – preparing an environmental impact statement (DPIE 2022a) and the NSW Planning Secretary's Environmental Assessment Requirements (SEARs) for the Project.

To address the development guidelines, a consolidated description of the Project that the applicant is seeking development consent for is required. This includes the Project overview and a detailed description of the specific characteristics of the Project; specifically:

- physical layout and design;
- uses and activities; and
- timing of Project stages and sequencing.

The Project SEARs requirements and where they have been addressed are listed in Table 3-1.

Table 3-1: SEARs requirements

Assessment matter	**Report locations**
Regional geology including a supporting map, the resource to be extracted, demonstrating efficient resource recovery within environmental constraints;	Sections 3.3.1, 3.3.2, 3.5 and 3.6
Details of the ore and waste rock, including mineralogy and deleterious elements and evidence of geological and grade (or quality) continuity of mineralisation in the deposit;	Sections 3.3.2 and 3.9.2.5
The mine layout and scheduling;	Sections 3.4 and 3.9
Average and maximum annual extraction and processing rates;	Section 3.9.2.1
Details of construction, operation and decommissioning, including any proposed staging of the development or refurbishing of infrastructure over time;	Sections 3.9, 3.9.1, 3.9.2 and 3.9.3
All components, infrastructure, materials, any plant and equipment and activities (including any infrastructure that would be required for the development, but the subject of a separate approvals process);	Sections 3.4, 3.5, 3.6 and 3.7
The likely interactions between the development and any other existing, approved or proposed mining related development in the vicinity of the site, including details of interactions with the Tritton Mine and any approvals required to ensure the development could proceed, noting that the Tritton Mine is currently only approved to undertake mining operations (including processing) until 21 December 2024;	Sections 1.6 and 1.6.2 Section 2.2 Section 3.4.3.3
In addition, the following SEARs are addressed in this chapter:	—
Site plans and maps at an adequate scale showing:	—
the location of the development components;	Figure 1-2 and Figure 3-7
existing infrastructure, land use, and environmental features in the vicinity of the development (including any other existing, approved or proposed infrastructure in the region);	Section 3.4 Section 6.1 and Figures 6-3 and 6-4
A waste (overburden, tailings, leach pad etc.) management strategy;	Section 3.9.2.5

Assessment matter	Report locations
A water management strategy;	Section 3.8 Section 6.5.5
Rehabilitation strategy, including details of the progressive rehabilitation of the site during and following construction and decommissioning;	Sections 3.9 and 3.9.3 Chapter 8, Rehabilitation and closure

3.2 Project overview

The Project elements Aeris is seeking approval for are described in detail in this chapter and summarised in Table 3-2. The Project resource estimations have been prepared from the Constellation Mineral Resource Update (18 August 2022).

Table 3-2: Mining Project summary

Project element	Summary of the Project
Project mine area	The proposed greenfield Project is in a rural setting and is proposed to occur on two freehold properties identified as 'Okeh' property (including Lot 4 of DP751341 and Lot 9 of DP751321) and 'Windella' property (Lot 10 of DP 751321). The Project site is sparsely vegetated, and the current land use is mainly sheep grazing with some dryland wheat cropping in the southern paddocks. The Project mine's total surface disturbance area is approximately 170 ha. The Project mine area is within exploration leases (EL) 6126, EL8987 and EL8084 held by Tritton Resources Pty Ltd.
Open cut pit mining method and extent	An open cut pit for open cut mining of the Project deposit will be developed. The open cut pit will be relatively small, with a maximum area of approximately 11.7 ha. The pit shell will have a maximum depth of approximately 110 m to -55 mRL.
Underground mining method and extent	An underground mine for the Project deposit will be developed using long-hole, open stoping with backfilling. The average feed rate from the underground mine will be 0.5 Mtpa. Underground production may peak up to one Mtpa in any given period. Access to the underground workings will be via a portal in a surface box cut and a 3,100 m long decline. Underground workings are to be developed to a depth of -280 mRL.
Production	The ore to be processed is estimated to be 2.4 Mt from the open cut pit and 3.6 Mt from the underground mine over the proposed life of the mine. This is a maximum annual production of one Mtpa of ore from the Constellation Project.
Resource	Indicated and inferred: • Copper—6.7 million tonnes at 1.85% copper; • gold—0.58 grams per tonne; • silver—2.9 grams per tonne containing 123 kt copper metal; • 125 koz gold metal; and • 620 koz silver metal.
Life of mine	The anticipated mine life is approximately 16 years, which includes: • an estimated one-year construction period; • ten years of mining operations; and • five years of decommissioning and rehabilitation activities.

Project element	Summary of the Project
Infrastructure corridor	A corridor, generally approximately 18 m wide, will extend between the Project mine and the existing Tritton Copper Mine incorporating: • the site access/haul road; • a water pipeline; • optic fibre cable; and • an underground electric conduit powerline.
Site access	Within the infrastructure corridor, access to the Project site will predominantly be via existing public roads. Operational traffic movements and deliveries to the Project mine will be via Okeh Road and a new haul road between the Mitchell Highway and Okeh Road. The new section of road, approximately 2,850 m long, will divert Project traffic north around Girilambone township. Once constructed, operational and haulage traffic will access the Project site via a new intersection on the Mitchell Highway. The new intersection will be approximately 830 m north-west of the existing Railway Road and Mitchell Highway intersection. Road upgrades are proposed to the existing Railway Road and Mitchell Highway intersection, which will include a channelised right-hand turning lane (for southbound traffic on the Mitchell Highway). A channelised right-turn treatment is also proposed for the intersection of the new road and Mitchell Highway (for northbound traffic on the Mitchell Highway). Construction traffic movements and deliveries to the Project site will be via Okeh Road, accessed via Murrawombie Road to the east of Girilambone, before the new haul road section is constructed in the first year of the Project (Year 0–construction).
Haulage route and traffic movements	Project ore will be transported to the Tritton processing plant at Tritton Copper Mine via the existing public road infrastructure and Aeris-owned roads. Haul vehicles will operate along the proposed site access route, travelling to Tritton Copper Mine via the Mitchell Highway, Railway Road and Yarrandale Road. Haul vehicles will be AB triple road trains with approximately 70-tonne payloads or B double trucks with approximately 50-tonne payloads. Operational traffic movements will be up to 82 truck movements per day. Concentrate from Tritton will be trucked to Hermidale rail siding and loaded onto rail to Newcastle Port. Copper crystal will be loaded and transported from the Project site by road and will continue by either road or rail. The existing rail networks are expected to provide enough transport capacity for the Project. Therefore, no new rail or port facilities will be required.
Off-site processing	Supergene and primary ore will be processed at the Tritton Copper Mine processing facility. Up to approximately 10 Mt of Project ore is expected to be processed at the Tritton processing plant over the life of the Project. Tritton Copper Mine processing facility operates under DA 41/98 (expiring 21 December 2028). A separate approval has been sought to continue processing at the site and increase the annual processing rate and related activities (refer to Chapter 1, Introduction, Section 1.6.2). The proposed production volume is 1.8 Mtpa.
On-site processing	Supergene, primary and high-grade ore will be crushed and screened on the run-of-mine (ROM) pad. Pre-concentration processes, including dry grinding and flotation to create a concentrate, will be undertaken adjacent to the ROM pad. Approximately 2.0 Mt of lower-grade oxide ore from the open cut pit will be processed by heap leaching at the Project site.
Cemented paste fill	Dewatered tailings material from the Tritton processing plant will be backhauled by trucks or road trains using the proposed haulage road to the Project site. The tailings will be screened and mixed with water and a binder in a mobile paste backfill plant at the Project site to produce cemented paste fill. Cemented paste fill will be used in the Project's underground mining activities.

Project element	Summary of the Project
Waste rock management	Approximately 6.1 Mm^3 of waste material will be generated from the open cut and underground mines over the life of the Project. The waste rock emplacement (WRE) has been designed for the total capacity, if required. It will be approximately 35 m above the adjacent land surface (top of the WRE at 205 mRL) and a maximum disturbance area of approximately 40 ha. Once underground operations commence, preference will be given to storing waste rock underground when possible. Waste material may also be stored within the open cut pit below the final level of the pit lake. Mineralised oxide waste will be stored separately in a mineralised waste pile with a capacity of 0.55 Mm^3.
Water supply	Water supply for the Project will be sourced from: • direct rainfall; • catchment runoff; • groundwater inflows; and • transferred via an underground water pipeline in the infrastructure corridor between Murrawombie Copper Mine and the Project, providing up to 258 ML in peak water demand years (Year 4). Project water demands will be managed within existing water licences held by Aeris. Total annual peak water demands for the Project are estimated to be 613 ML/yr (Year 4).
Water management	The Project's water management system will include: • water storage dams; • a clean water diversion system diverting clean water around disturbed areas and mine site infrastructure; • a catchment drainage system around disturbed areas to contain mine-affected waters; • a bi-directional water supply pipeline from Murrawombie Copper Mine; • storing wastewater from ancillary infrastructure for on-site treatment and on-site disposal or reuse; • erosion and sediment controls during construction and operational phases; and • groundwater dewatering from the underground workings and open cut pit sump to the site water management dams.
General infrastructure	Additional infrastructure to be developed at the Project site will include: • a mine laydown area and workshop; • a ROM stockpile for mined ore; • a heap leach pad, oxide ore stockpile and crushing area and other processing facilities, including process and raffinate ponds and solvent extraction plant; • a paste plant, emulsion storage and shotcrete batch plant; • topsoil and subsoil stockpiles; • solar farm and on-site power station; and • administrative facilities, including offices, amenities and a car park.
Power supply	Mains power will be generated at the Project using a combination of 6 MW DC solar photovoltaic (PV) (12 ha area) and a 5,000 kVA diesel genset.
Workforce	The Project will provide continued employment for existing Tritton Copper Operations personnel. It will provide an average of approximately 178 full-time equivalent (FTE) jobs for employees and contractors during operations. Operational employees will work industry-standard 12-hour shifts on seven-day roster cycles. Approximately 95 FTE contractors will be required during the 12-month construction phase of the Project.
Hours of operation	Mining operations and haulage activities are proposed to occur 24 hours a day, seven days a week. Construction activities during the Project construction phase will be undertaken 24 hrs a day, seven days a week.

Project element	Summary of the Project
Capital investment	Investment will be approximately $120 M over the life of the mine.

3.3 Geology relating to the Project

3.3.1 Regional and local geology

Most of the Girilambone region is covered by colluvial and alluvial sediments with small, scattered areas of weathered bedrock rises (≤ 30m in relief). There are some low hills (30–90 m in relief) and more extensive highly weathered bedrock rises. It is underlain by a relatively poorly known basement composed of Ordovician Girilambone Group rocks with some in-faulted slices of probable Late Silurian to Early Devonian Cobar Supergroup rocks, intruding granites and some Late Devonian outliers or down-faulted blocks (MQueen 2008).

The Girilambone Group consists largely of a range of sediments grouped into turbidites (sedimentary material with alternating source and depositional regime), with some intermediate to mafic (dark coloured, containing magnesium and iron) igneous rocks sporadically spread across the landscape. These rocks have been subjected to at least two phases of deformation and metamorphosed to variable grades (lower greenschist to lower amphibolite facies). Rock types include:

- quartzites;
- arenaceous meta-sediments;
- slates;
- phyllites;
- cherts;
- meta-basalts and
- altered tuffs (Pogson and Felton 1978).

Cobar Supergroup rocks (mostly Kopyje Group) occur in narrow and elongate, faulted synclinal keels within the Girilambone Group rocks (Burton *et al.* 2012). Rock types include:

- conglomerates
- siltstones
- quartzites (including the Coronga Peak Quartzite); and
- felsic volcanic rocks (Florida Volcanics).

Poorly exposed felsic and I-type character granites are known in the northern part of the region and currently considered to be Siluro-Devonian in age (Blevin and Jones 2004; Burton *et al.* 2012). There are several small granite bodies in the west, close to the eastern margin of the Cobar Basin (e.g. Nymagee Igneous Complex and the Tinderra, Wilgaroon, Wave Hill and Beanbah granites).

The Girilambone–Cobar–Nymagee region is one of the richest mineral provinces in NSW. Major deposits occur in the Cobar Basin around Girilambone and at Canbelego and Nymagee (Figure 3-1). However, much of the area has not been explored by modern exploration methods. Exploration has been hampered by the extensive regolith cover as well as poor knowledge of the underlying geology. Most discovered mineral deposits and occurrences have been found:

- on or close to the surface, or
- as deeper extensions to known, smaller outcropping deposits.

A small number of deposits have been discovered beneath thin transported cover or in areas of deeper, partly leached in situ regolith (such as the Tritton deposit). These deposits in the landscape largely lie in a relatively restricted zone (height from 225–325 m above sea level). This zone reflects the range in exposure level of the mineralised rock units in the landscape. There are large areas where the mineralised crust is undercover or deeply weathered, and these remain prospective for further discoveries.

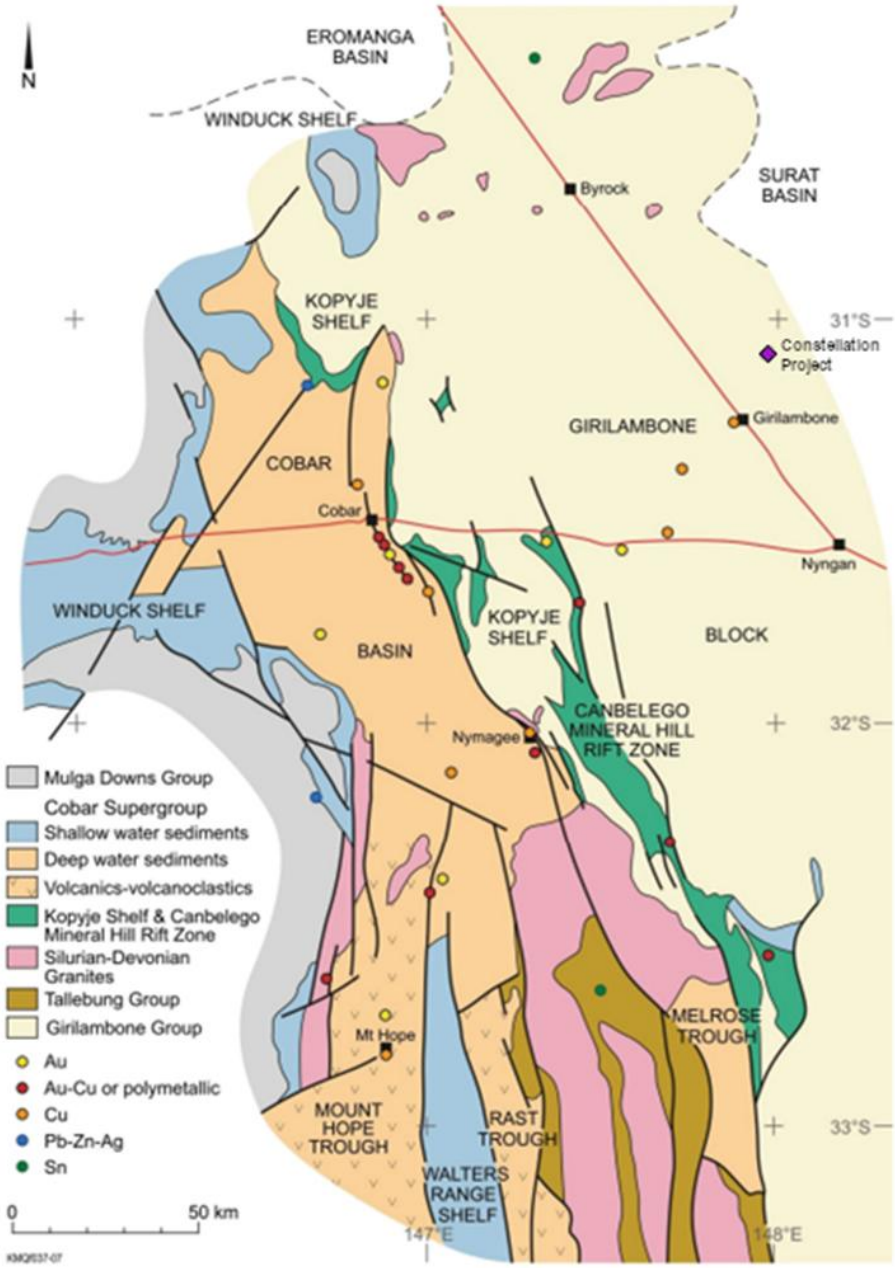


Figure 3-1: Regional geology of the Cobar and Girilambone basins (McQueen 2008)

3.3.1.1 The Girilambone Group (Beds)

The geological facies for the Girilambone Group are summarised in Figure 3-2 (Girilambone "Beds"). The sequence was deposited as a series of sediments in a deep to very deep (slope to basin) marine environment (Burton *et al.* 2012).

Chert horizons in the Girilambone Group indicate deep water and a quiet depositional environment. Primary sedimentary features such as graded bedding (common) and load casts (rare) have been observed. The Girilambone Group lacks strike extensive marker horizons, although the Budgery Sandstone Member is a key unit regionally. This member is a quartz-rich metasandstone to quartzite and has a similar provenance and maximum depositional age to other parts of the Narrama Formation, based on detrital zircon studies (Fraser *et al.* 2014).

Jasper units have been noted at several locations in the Girilambone Group, including being in direct contact with basalts at Mount Dijou (Burton *et al.* 2012).

Much of the landscape underlain by the Girilambone Group is either covered by a thin veneer of alluvial sediments or is weakly dissected with sparse bedrock exposure. When outcrop does occur, it is generally low-lying and usually strongly weathered.

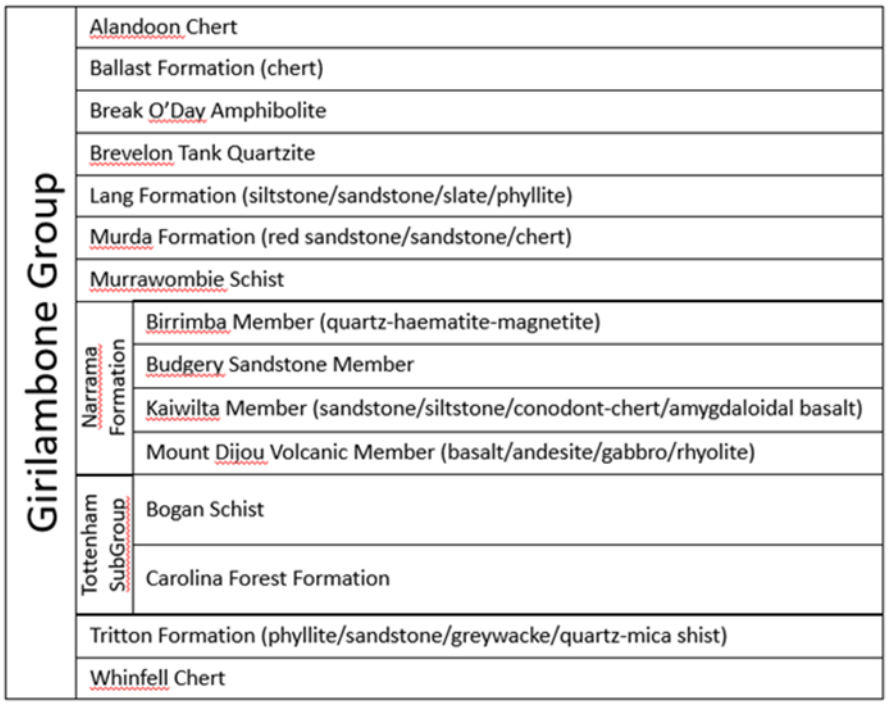


Figure 3-2: Stratigraphic facies of the Girilambone Group

3.3.2 Deposit geology

The Project deposit is in Exploration Licence (EL) 8987, with mineralisation extending into neighbouring (EL) 6126 and (EL) 8084 (Chapter 1, Introduction, Figure 1-3). It bears marked similarities with other copper sulphide deposits discovered in the Tritton Copper Operations tenement package, including the Tritton (+20 Mt) and Murrawombie (+15 Mt) deposits. Both mineralised systems are interpreted to have strong lithological and structural controls on the emplacement of sulphide mineralisation. Mineralisation forms are sheeted with elongated pipe-like geometries and long (continuous) down plunge dimensions.

Copper sulphide deposits within the Tritton Copper Operations, including the Project, appear to correlate with zones of structural complexity, with copper mineralisation appearing to occur late in the structural deformation events. Folding and faulting in these structural domains have accentuated rheological contrasts enabling increased dilation and space for metal-rich fluids to concentrate/precipitate sulphides.

Sulphide textures within the Project deposit vary from disseminated through to massive. The dominant sulphide mineral is pyrite, with lesser chalcopyrite + / - pyrrhotite and sphalerite. Gold mineralisation is associated with pyrite and does not necessarily correlate with chalcopyrite. Occasional magnetite occurrences occur within the sulphide package.

The discrete lack of any well-developed soil profile or recent major erosional event has had the effect of limiting the extent of a secondary dispersion halo. A constrained oxide and/or supergene horizon has developed over the primary sulphide body. The oxide horizon forms a sub-horizontal blanket over the top of the central mineralisation trend. Copper minerals within the oxide domain are dominated by malachite and azurite. The highest copper grades are interpreted to form where the mineralised system extends to the surface. Native copper has been identified in some drill cores; however, it is not considered to be prevalent in the oxide domain.

Within the oxide domain, the copper minerals include:

- malachite
- azurite
- minor chrysocolla; and
- native copper.

Underlying the oxide horizon is a copper-enriched supergene domain characterised by the presence of chalcocite.

The highest apparent grades of copper occur in the chalcocite domain and the quartz-rich sulphide zones with a chalcopyrite breccia-infill.

The primary sulphide system plunges moderately to the south-east (~30°on average) and consists of two main provinces not discretely independent from each other mineralogically. However, one dips moderately to the east and weakly to the north and the other steeply to the south.

On the northern edge of the Project deposit in the south-dipping province, distinctive graphite and carbonate units have been identified footwall to the sulphide mineralisation and have been used as marker beds to close out the extent of the mineralised system, as shown in Figure 3-3. Figure 3-3 also depicts the different copper domains, including:

- oxide (green);
- supergene (purple); and
- primary sulphide (orange).

The Project mineralised system has been traced 1,100 m down plunge and up to 300 m along the strike. The deposit remains open down plunge.

Previously reported downhole electromagnetic (DHEM) surveying detected two large conductive bodies below the drilling base. Copper sulphide mineralisation was intersected by drilling and targeting one of the modelled DHEM plates, which has provided strong evidence that the Project deposit continues further down plunge below current drilling.

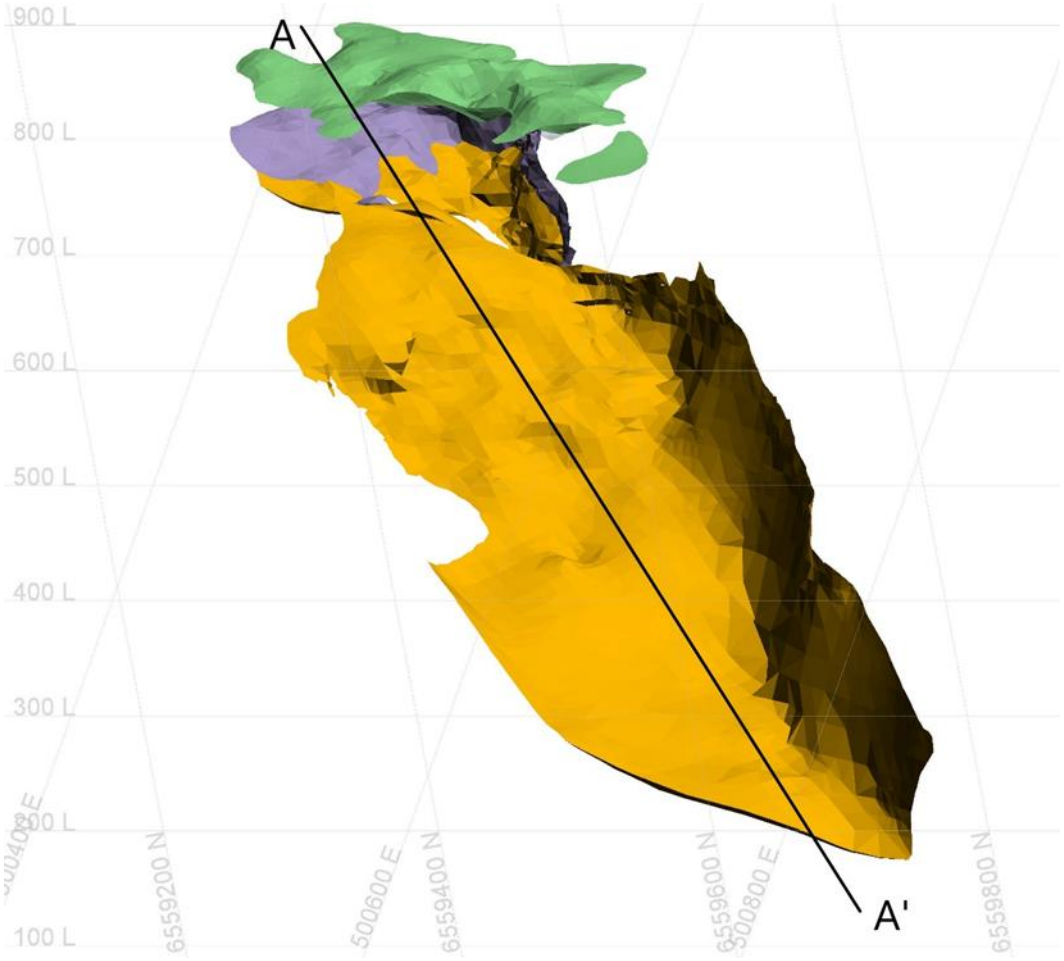


Figure 3-3: Oblique view looking north-east at the Project deposit showing the different copper domains

3.3.2.1 Mineralisation

Copper mineralisation at the Constellation deposit is hosted within three different copper domains, defined by the dominant copper minerals as:

- oxide;
- supergene; and
- primary.

The oxide domain forms a flat lying tabular body from near surface (<5m) to approximately 40 m below surface. The oxide domain is host to a variety of copper minerals, dominated by azurite and malachite with lesser amounts of native copper and chrysocolla. Malachite and azurite commonly form thin (<1cm) veinlets or sparse disseminations throughout the host rock. The supergene domain is dominated by chalcocite, which occurs in a range of different texture types, including disseminations, bands, and semi-massive. In places, the supergene domain contains some azurite/malachite and chalcopyrite, indicating portions of the supergene domain are a mixture of different all three copper domain types. Pyrite is commonly associated with chalcocite within the supergene domain.

The primary sulphide domain is the largest modelled copper domain at the Project deposit. Sulphide textures vary from disseminated/stringer pyrite grading to banded, semi-massive and massive pyrite (Figure 3-4). Chalcopyrite is closely associated with pyrite-forming disseminations, stringer veinlets and erratic remobilised accumulations. Higher grade chalcopyrite is typically associated with either massive pyrite or remobilised chalcopyrite/quartz breccia, commonly referred to as Durch Bewegung texture.

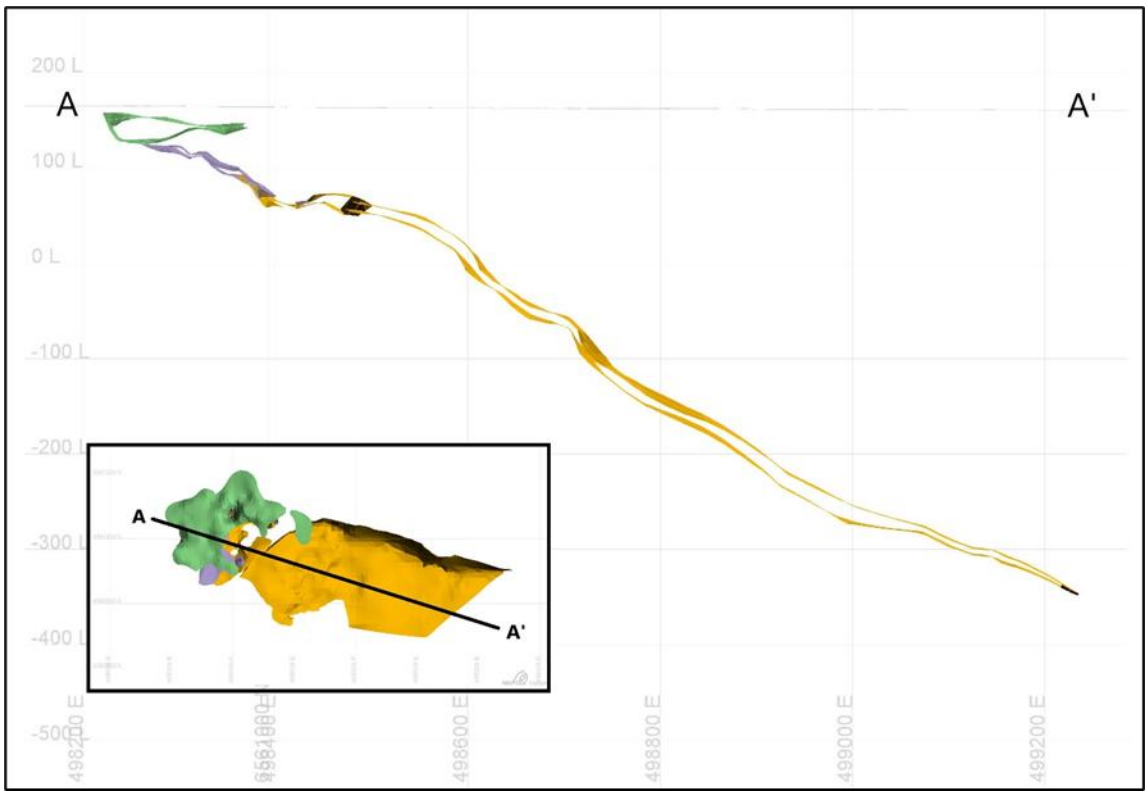


Figure 3-4: Representation of the Project mineralised system (cross-section looking north).

3.3.2.2 Constellation mineral resource

A Mineral Resource Estimate (MRE) was reported in August 2022 for the Project in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves 2012 (JORC Code) (Table 3-3 and Figure 3-5). The August 2022 Project MRE contains:

- 6.7 million tonnes at 1.85% copper, 0.58 g/t gold and 2.9 g/t silver;
- 123 thousand tonnes of copper metal;
- 125 thousand ounces of gold metal;
- 620 thousand ounces of silver metal; and
- oxide, supergene and primary mineralisation.

The mineral resource is based on an exploration and resource definition drill program totalling 173 drillholes, which has intersected:

- oxide (copper hydroxides);
- supergene (chalcocite); and
- primary copper (chalcopyrite) mineralisation.

The geometry of the sulphide mineralised system at the Project is largely characterised by a gently dipping (~35°) body to the south-east. As the geological understanding of the deposit increased with additional drillhole data, particularly within the upper 150 m of the deposit, it became apparent the sulphide body changes orientation from gently dipping to sub-vertical. The sub-vertical body has been confirmed to 150 m below the surface. Below this depth, there is no drilling intersecting the interpreted extension of the sub-vertical sulphide body.

The geological understanding of the “vertical zone” of the mineralised system is still in progress and requires further drilling to more confidently understand the mineralised geometry and grade distributions.

The MRE is classified as Indicated and Inferred materials in accordance with the JORC Code:

- Indicated and Inferred materials are constrained in an open pit reporting shell.
- Inferred material is predominantly reported below the pit shell.

Copper, gold, silver, zinc, iron and sulphur have been estimated within the MRE.

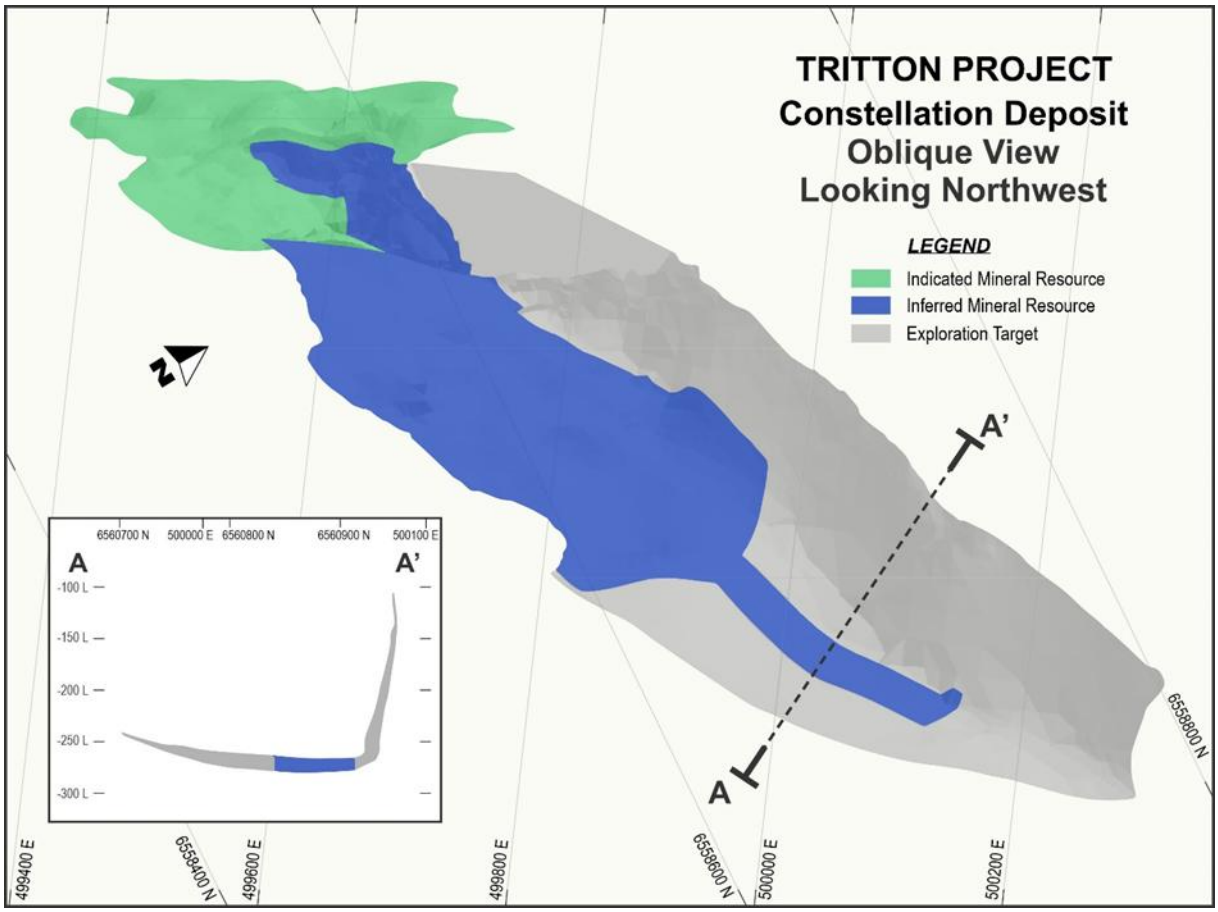


Figure 3-5: Constellation reported mineral resource indicated and inferred

Table 3-3: Constellation mineral resource

AUGUST 2022 CONSTELLATION MINERAL RESOURCE									
Mineralisation type	**Resource category**	**Cutoff grade (Cu%)**	**Tonnage (kt)**	**Cu (%)**	**Au (g/t)**	**Ag (g/t)**	**Cu metal (kt)**	**Au metal (koz)**	**Ag metal (koz)**
Oxide	Indicated	0.2	1,600	0.6	0.1	0.7	10	7	36
	Inferred								
Primary/ Supergene	Indicated	0.3	510	2.3	1.1	4.4	12	14	69
	Inferred		1,000	3.5	0.6	3.3	29	29	125
Subtotal (O/P)	Indicated	various	2,110	1.0	0.3	1.5	22	21	104
	Inferred		1,000	2.8	0.9	3.7	29	29	125
	Total		3,110	1.6	0.5	2.2	51	50	229
Primary/ Supergene	Indicated	0.9	130	2.1	1.1	4.9	3	5	20
	Inferred		3,300	2.1	0.7	3.5	70	70	371
	Total		3,500	2.1	0.7	3.5	72	75	392
Total (O/P & U/G)	Indicated	various	2,300	1.1	0.4	1.7	25	26	125
	Inferred		4,400	2.2	0.7	3.5	99	99	496
	Total		6,700	1.8	0.6	2.9	123	125	620

3.3.2.3 Resource recovery

Open cut and underground mining methods, similar to the method utilised at Murrawombie Copper Mine and Tritton Copper Mine, are proposed to optimise extraction from the Project mineral resource while minimising environmental impacts.

The Project mine plan represents efficient resource recovery:

- It utilises industry-standard mine planning and optimisation techniques to ensure optimised resource extraction.
- Processing and economic parameters have been carefully considered to determine the marginal economic cutoff grades and ensure that any resource that will add value is extracted.
- Alternative processing options have been investigated (including heap leach and ore sorting) that present potential to improve the economic viability of lower-grade material and to lower the cutoff grade.
- The underground method includes using paste fill to maximise recovery.

Appropriate economic and technical justifications have been completed for the proposed mining/production scheme:

- Industry-standard optimisation techniques will be used to design the open cut pit and underground mine.
- Ore will be selected using the marginal economic cut off for the open cut and underground mines plans.
- Resources that would not be economic to extract due to physical constraints, such as the location of infrastructure or the WRE, will be excluded or sterilised.
- The mine plan is based on optimising the transition from open cut to underground.

3.4 Project area and layout

The Project comprises the following:

- Project mine site (as shown in Figure 3-6 and described in Chapter 1, Introduction, Section 1.5.3);
- infrastructure corridor containing the site access/haul road, water pipeline and optic fibre cable between the Project mine site and the existing Murrawombie Copper Mine (Chapter 1, Introduction, Figure 1-2); and
- proposed haul road in the infrastructure corridor connecting to an existing approved haul road between the Murrawombie Copper Mine and Tritton Copper Mine (Chapter 1, Introduction, Figure 1-2).

Ore processing at the Tritton Copper Mine and water management at the Murrawombie Copper Mine will be managed with existing approvals and licences and modifications to those licences (refer to Chapter 1, Introduction, Section 1.6.2).

3.4.1 Project mine site

The Project mine site will support open cut and underground mining (Figure 3-6). Mining will initially be by an open cut pit followed by underground mining accessed by the portal pad in the box cut.

A series of haul roads will enable mining vehicles and equipment to transport

- mined ore to the ROM stockpile pad prior to crushing and screening and hauling to the off-site processing plant; and
- waste rock to the WRE.

Lower-grade ore will be processed on-site by heap leaching. There will be ancillary infrastructure to support the mining and processing activities. The following will be required for processing:

- agglomeration pad;
- heap leach pad;
- associated processing facilities, including water storage; and
- solvent extraction (SX)/crystal plant.

On-site processing activities are further described in Section 3.9.2.2.

Ancillary facilities on the mine site will include:

- a mine laydown area and workshop; and
- administrative facilities, including offices, amenities, and car park.

Topsoil stockpiles will be used to store the soil removed during the site clearing and preparatory earthworks.

A paste plant and emulsion storage tanks will prepare the tailings to be returned to the underground mine area; a shotcrete batch plant will prepare concrete for the underground mine.

Power will be supplied to the site from a solar farm and generator and via an on-site power station (to be located with the solar farm).

The mining and ancillary activities will be supported by water management, storage and pipeline infrastructure during construction and operations and at closure. The Project water management system will include:

- water storage dams;
- a clean water diversion system diverting clean water around disturbed areas and mine site infrastructure;
- a catchment drainage system around disturbed areas to contain mine-affected waters;
- a water supply pipeline from the Murrawombie Copper Mine;
- wastewater storage from ancillary infrastructure for on-site treatment and on-site disposal or reuse;
- erosion and sediment controls during construction and operational phases; and
- groundwater dewatering from the underground workings and open cut pit sump to the site water management dams.

Further details regarding water management are described in Section 3.8 and Chapter 6, Environmental assessment, Section 6.5 Surface water.

The water pipeline, to be located in the infrastructure corridor between the Project mine site and the Murrawombie Copper Mine, will enable water to be transferred to and from the Project mine site (refer to Sections 3.4.3.2 and 3.4.2).

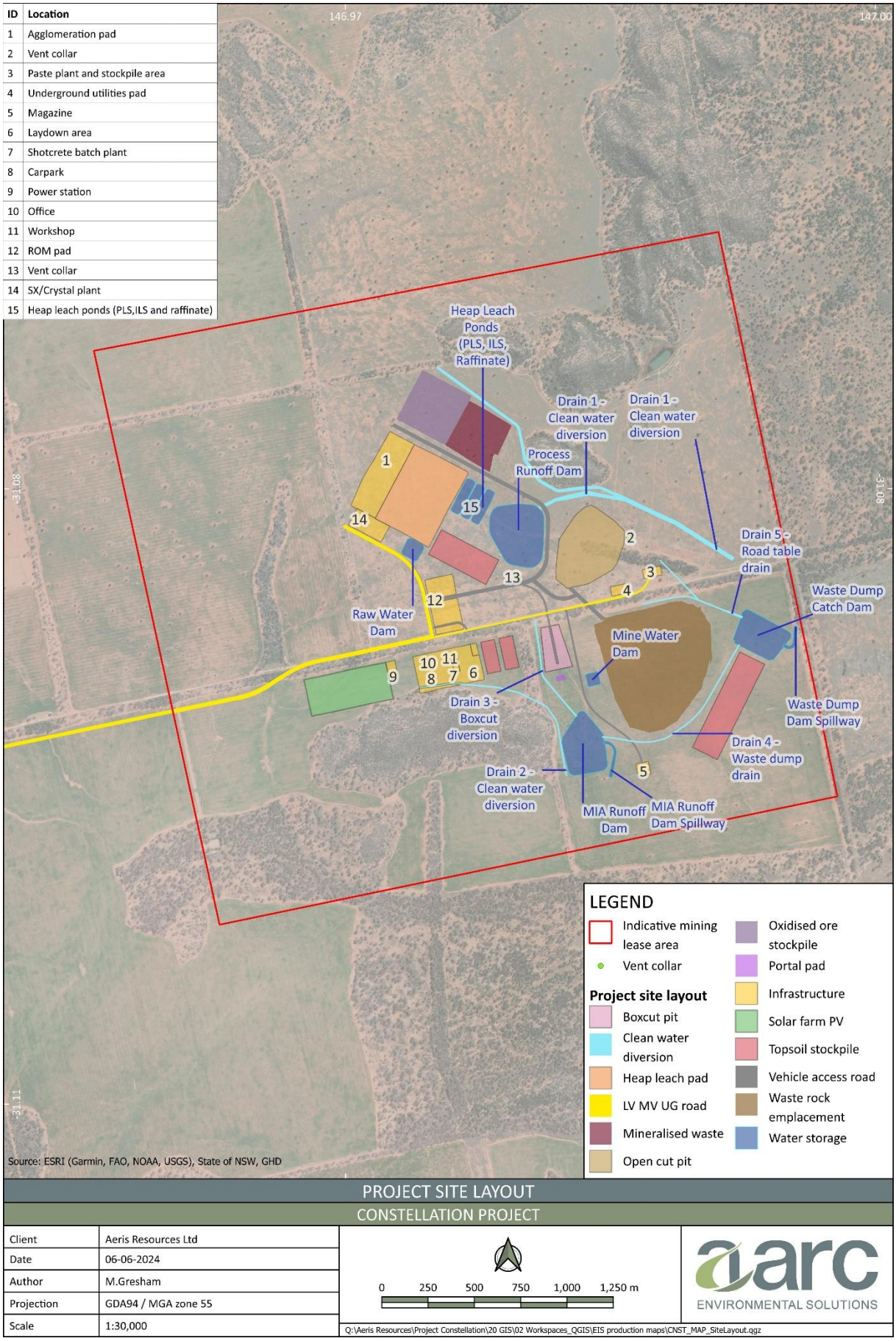


Figure 3-6: Project site layout and disturbance extent

3.4.2 Infrastructure corridor

An infrastructure corridor, generally 18 m wide, between the Project mine site and the existing Murrawombie Copper Mine will contain the site access/haul route a buried water pipeline with an optic fibre cable and an underground electrical conduit (Figure 1-2 and Figure 3-7).

The infrastructure corridor will be aligned with existing roads from the Project mine site to the Mitchell Highway.

Approximately 800 m north of Girilambone, there will be one 2,850 m long greenfield section of the corridor connecting the existing Okeh Road to the Mitchell Highway.

At the entrance to the Project mine site, the infrastructure corridor will be south of the existing road to avoid remnant vegetation. The alignment has been selected to avoid and minimise disturbing remnant vegetation adjacent to the roads and minimise direct impact on properties and stakeholders along the route.

South of the Mitchell Highway, the infrastructure corridor follows the Railway Road to the Murrawombie Copper Mine (Figure 1-2).

At the entrance to the Murrawombie Copper Mine, there will be a section of buried pipeline and optic fibre cable only, as that section will not be the haul road.

The infrastructure corridor containing the new haul road will follow Yarrandale Road, to the existing haul road from Murrawombie to the Tritton Copper Mine (Section 3.4.3.3).

Throughout the life of the Project, the bi-directional water supply pipeline will provide a contingency water supply to meet site water demands and transfer excess contaminated water to the Murrawombie Copper Mine.

The pipeline and the underground electrical conduit would be buried in a trench generally adjacent to the road, and it is proposed to cross under the Mitchell Highway.

A pump would be located at either end of the pipeline. At the Mitchell Highway road crossing, the buried pipeline would be under the Mitchell Highway. Steel enveloper pipes may be required for mechanical protection at road crossings. The pipeline would transport potentially contaminated water; therefore sleeving may be required at watercourse crossings and flow meters for end-to-end leak detection. Water supply by the water pipeline is further described in Section 3.8.3.

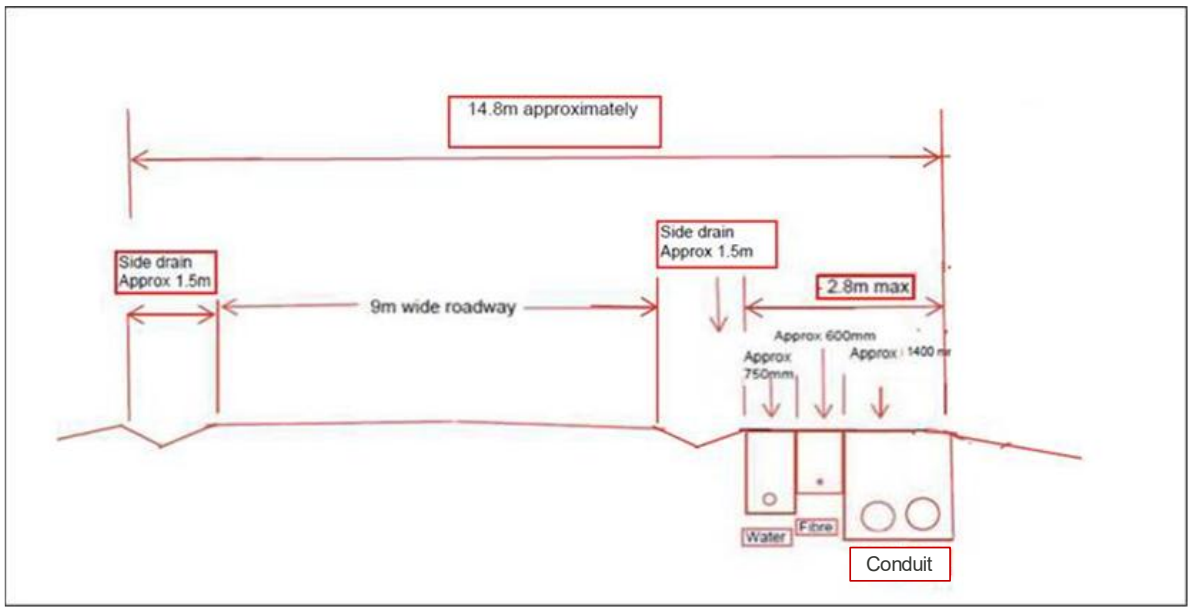


Figure 3-7: Indicative Infrastructure corridor

3.4.3 Haul route

The proposed haul route from the Project site to the Tritton Copper Mine will utilise public and private roads, including a section of previously approved haul road used by other Tritton Copper Operations in the region—the Avoca Tank Copper Mine and the Murrawombie Copper Mine (Figure 3-8). To support haulage activities, there will be:

- a road upgrade between the Project site and the Mitchell Highway;
- a new T intersection to link the proposed haul road with the eastern side of the Mitchell Highway (north of Girilambone); and
- an upgrade to the intersection of the Mitchell Highway with Railway Road (west of Girilambone).

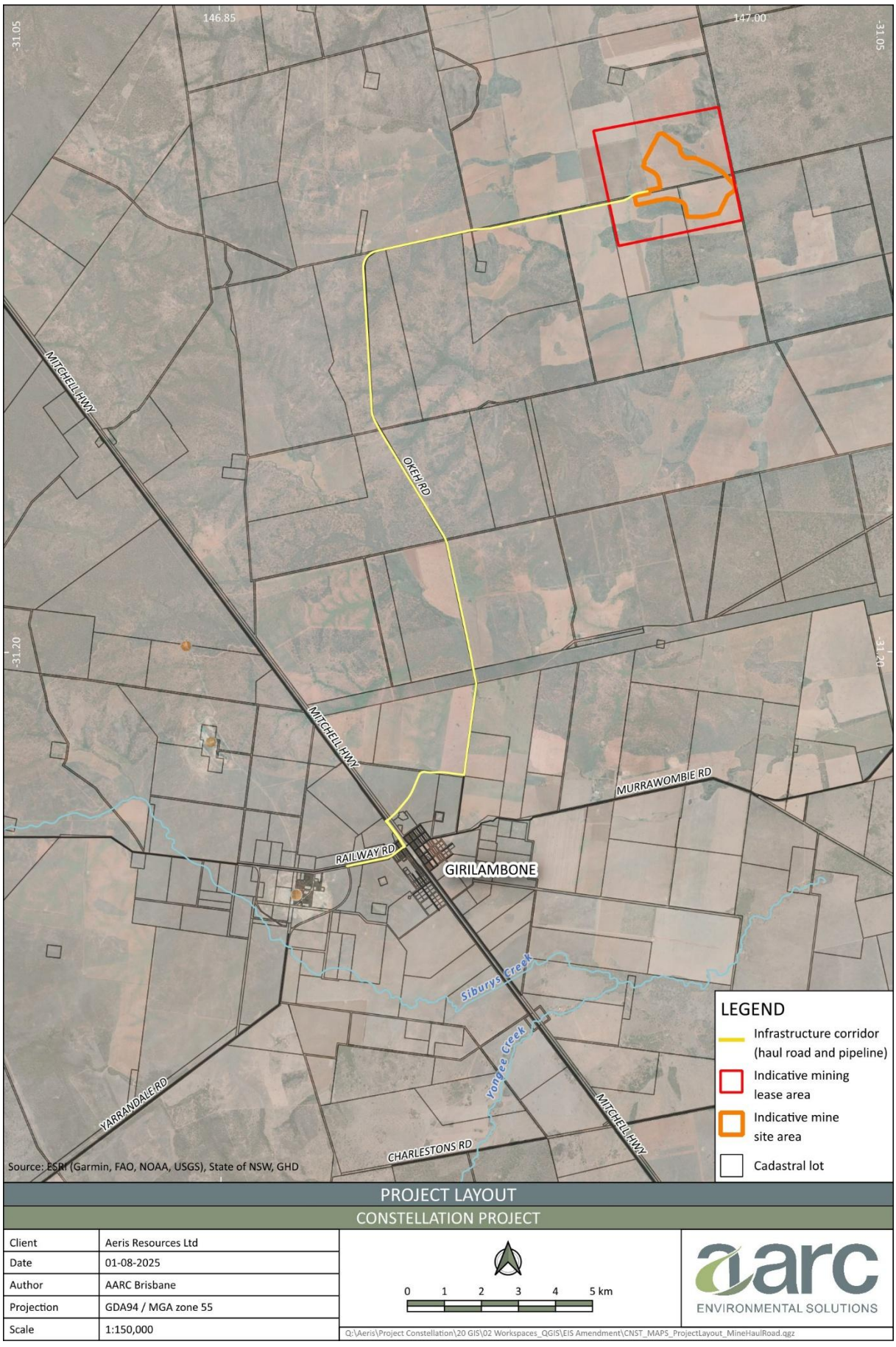


Figure 3-8: Proposed haul route

3.4.3.1 Road upgrades and new roads

Upgrades to the existing Okeh Road (from the intersection of the new road, north to the Project site) will be completed to accommodate Project haulage activities within the 18 m infrastructure corridor and the existing road disturbance footprint.

Opportunities to reduce the extent of clearing (e.g. by installing safety barriers around large trees) will be reviewed during detailed design development.

A new section of road will be built from the Okeh Road and the Mitchell Highway intersection on the Mitchell Highway. The alignment of that new section of infrastructure corridor is approximately 800 m north of Girilambone, and will traverse lots 19DP751311, 13DP751311 and 2DP1296861. The new 2,850 m section connecting to the existing Okeh Road will be used for a haul route and site access. The road will be unsealed, consistent with the Okeh Road.

The haul road to be built in the infrastructure corridor will be constructed and maintained in accordance with industry standards. An appropriate traffic management plan will be implemented prior to construction to address the stages of the Project, including:

- construction;
- maintenance;
- operation, and
- decommissioning.

The plan will also address safe haulage in dry and wet weather, focusing on but not limited to:

- speed limits;
- intersections;
- bends and lines of sight;
- gradients, and
- separation of heavy vehicles and light vehicles when necessary.

3.4.3.2 Intersection upgrades on the Mitchell Highway

The new T intersection on the Mitchell Highway/new haul road will include a short channelised right-turn treatment. Further design details are provided in Chapter 6, Environmental assessment, Section 6.15, Transport and Attachment 4, Road intersections.

An intersection upgrade will also be completed for the Mitchell Highway and Railway Road intersection to optimise road safety for operational traffic and other road users. Upgrades will include a short channelised right-turn on the approach to the Railway Road from the Project site. Some clearing and road widening will be needed to accommodate the intersection upgrades. Further design details are provided in Chapter 6, Environmental assessment, Section 6.15, Transport, and Attachment 4, Road intersections.

3.4.3.3 Existing haul route

The approved, existing haul route commences south of the Murrawombie Copper Mine on Yarrandale Road. The haul route from the Murrawombie Copper Mine to the Tritton Copper Mine will not require any upgrades.

The proposed haul route and the existing approved haul road are illustrated in Chapter 1, Introduction, Figure 1-2 and further described in Chapter 6, Environmental assessment, Section 6.15, Transport.

3.4.4 Extent of disturbance

The Project's physical layout and disturbance extent is shown in Figure 3-6. Disturbance associated with the Project will be limited to:

- the Project site area of 170 ha;
- a new section of infrastructure corridor and haul road west of Girilambone town;
- a section of haul road at the entrance to the Project site (approximately 1.4 ha), refer to Chapter 1, Introduction, Figure 1-2); and
- upgrades to the existing road infrastructure and buried pipeline; specifically:
    - the infrastructure corridor between the Murrawombie Copper Mine and the Project mine site, and
    - the 0.08 ha for the pipeline near Murrawombie Copper Mine).

To minimise disturbance, the proposed haul route from the Project site to the Tritton Copper Mine will utilise public and private roads, including a section of the existing haul road used by other Tritton Copper Operations in the region:

- Avoca Tank Copper Mine; and
- Murrawombie Copper Mine.

The Project design elements implemented to avoid and minimise impacts to environmental values are outlined in Chapter 1, Introduction, Section 1.5.2.

3.5 Open cut mine

Open cut mining, using conventional hard rock techniques, will target the relatively shallow oxide mineralisation, mining down to approximately 55 mRL.

The indicative design of the open cut pit is shown in Figure 3-9 and was selected as:

- the open cut pit is relatively small;
- the total material movement is approximately 14 Mt; and
- the mining rate has been scheduled to maximise the production rate of feed to the Tritton.

The open cut pit will be a terrace mining operation with 10 m bench intervals. A two-way ramp 25 m wide will be constructed, entering the pit from the south-west. The pit benches and ramp design parameters are based on accommodating Caterpillar 777G haul trucks during mining operations.

The uppermost benches will provide waste rock zones of moderate dimensions that lend themselves to bulk mining, and some ore is expected to be present in continuous zones that may also be amenable to productive mining.

Waste rock from the open cut pit will be hauled from the pit and managed in the WRE, proposed to be located immediately south of the open cut pit. A small proportion of waste rock from the open cut pit may be crushed for:

- construction aggregate;
- road base and sheeting; and
- blast hole stemming.

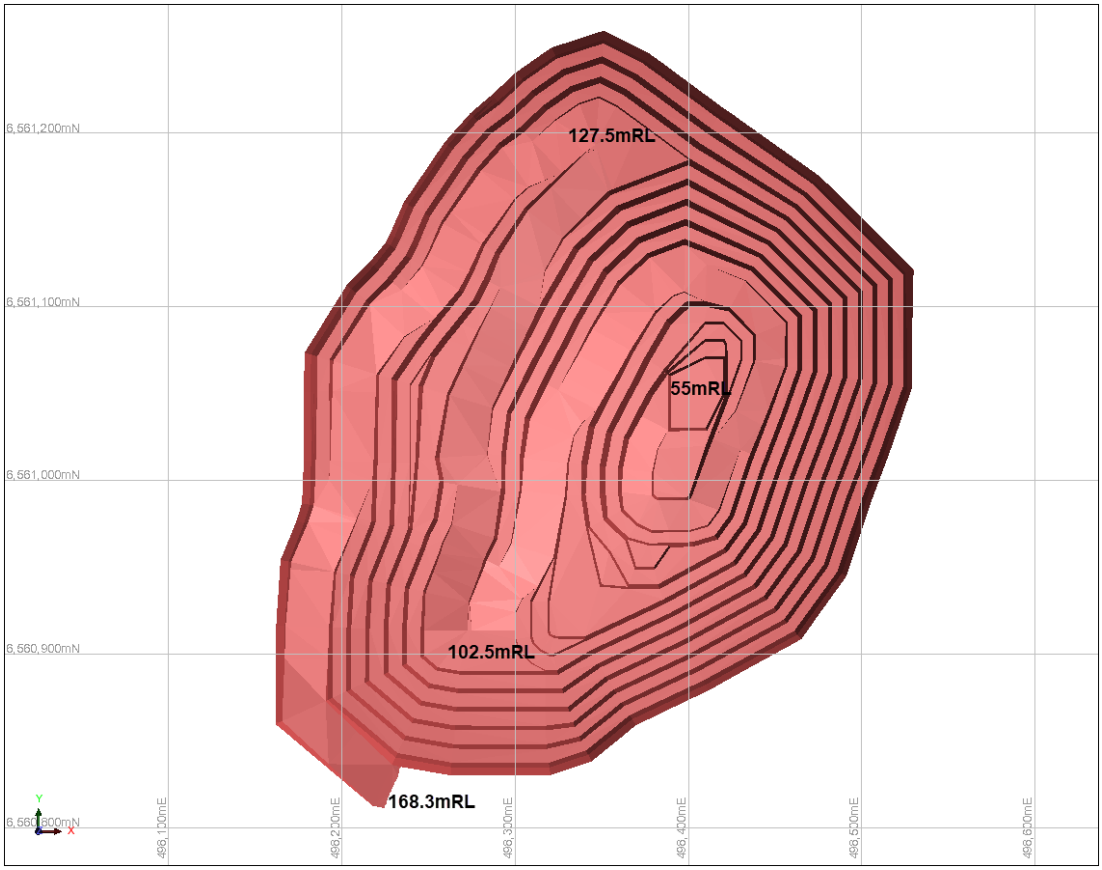


Figure 3-9: Indicative open cut pit design

3.5.1 Open cut mining methods and pre-mining activities

Developing the open cut pit, and open cut mining will require the following activities:

- **Sediment control:** The main sediment and water controls will be installed prior to any vegetation or soil being disturbed.
- **Surface drainage:** Surface drainage will be designed to ultimately re-enter natural systems, except for contaminated residual leachate from heap leach pads that will drain to the pit. Sediment containment structures will be operational and maintained until vegetation is established.
- **Vegetation clearing:** Vegetation will be cleared immediately prior to topsoil stripping, during the first year of mining. This process will make all mining and dumping areas available, providing flexibility to schedule the open cut mining and waste rock dumping. Existing vegetation in the open cut pit footprint is generally composed of previously cleared and a highly modified derived native grassland, with a limited area of native woodland vegetation. A detailed vegetation and topsoil management plan will be developed for the Project.
- **Topsoil management:** Topsoil of suitable quality as a growth medium to use in rehabilitation activities, typically to a depth of 200 to 300 mm, will be stripped from the open cut pit footprint. This will be completed by a combination of scraper, excavator, bulldozer, loader, and truck, as appropriate; and a water cart for dust suppression. Topsoil will be stockpiled separately from other soil sources. Topsoil will be managed in accordance with specific soil management, stockpiling and re-application procedures developed for the Project (refer to Chapter 6 Environmental assessment, Section 6.1 Soil and land capability).
- **Subsoils and regolith stripping and stockpiling:** These materials will be stripped and stockpiled separately for potential use as low permeability materials and growth/cover material. Excess material (including topsoil at the site) for site rehabilitation could be moved to Murrawombie Copper Mine site to use for site rehabilitation.
- **Grade control:** Grade control sampling would be undertaken by reverse circulation drilling in advance of the mining benches. Samples would be analysed to define ore zones for markout. Drill holes would be approximately 60 m hole depth to cover benches. Grade control and marking out of ore zones would be undertaken prior to mine production.
- **Drilling and blasting:** Open cut mining will use conventional drilling and blasting techniques for productive excavation. Drilling and blasting will generally be conducted on 5 m high benches, and potentially 10 m benches in the broader upper benches, with blast holes drilled using top-hammer hydraulic drill rigs. Conventional non-electric initiation products will be used for most blasts, while wet conditions after prolonged rainfall or due to groundwater may necessitate using emulsion explosives. Explosive materials will include initiating products, ammonium nitrate fuel oil and emulsion explosives. They will be stored in a dedicated magazine that will be located at an appropriate distance from other operational activities. Refer to Appendix 13 Preliminary hazard analysis.
- **Stemming material:** Material will be obtained by crushing and screening suitable aggregates sourced from hard rock at or near the Project. Standard commercial products will be used with the principal blasting agent, ammonium nitrate and fuel oil. Blasts will be fired during the dayshift only. The exclusion zone for personnel around the blast would depend on the specifics of the shot and the material; however, it is expected to typically be around 500 m. A comprehensive blasting procedure will be implemented as part of the mine safety management plan to ensure the safety of personnel and equipment in and around the mine during blasts.
- **Loading and hauling:** Blasted waste rock and ore will be loaded and hauled by a mining fleet likely to comprise a 100 t to 200 t class diesel hydraulic excavator loading 90 t rigid dump trucks. An example would be a 107 t Komatsu PC1250SE-8R excavator loading 90 t Caterpillar 777 dump trucks. The different ore types and waste rock types will be mined and stockpiled separately. The priority will be to mine the open cut down to a depth of 30 to 40 m to expose supergene/chalcocite ore, which will then be mined at a rate of 0.5 Mtpa. Chalcocite ore will be stockpiled on the ROM pad to the west of the open cut for haulage to the Tritton processing plant. Oxide ore that is mined in the upper benches prior to commissioning of the heap leach facilities will be placed in a stockpile adjacent to the heap leach pad in a temporary oxide ore

stockpile. After commissioning of the heap leach facilities, oxide ore will be hauled to the heap leach crusher area, and either directly tipped into the crusher or placed in a stockpile for subsequent rehandling to the crusher.

- **Mined supergene/chalcocite ore**: Material will be hauled and stockpiled on the ROM pad in preparation for hauling to the Tritton processing plant.
- **Waste rock:** This material will be hauled to the WRE.

At the completion of mining, the final open cut pit will be a relatively small void. The final void will remain as a permanent terminal sink (pit lake) to groundwater (Figure 3-10). Although the pit lake is in direct contact with a fractured rock aquifer with geological structures, it does not necessarily increase the risk of seepage to the surrounding groundwater environment. Groundwater will only flow from a higher elevation or pressure to a lower elevation or pressure, regardless of the hydraulic conductivity of the aquifer. Therefore, seepage from the pit lake to the adjacent aquifer is not expected (refer to Chapter 6 Environmental assessment, Section 6.4 groundwater).

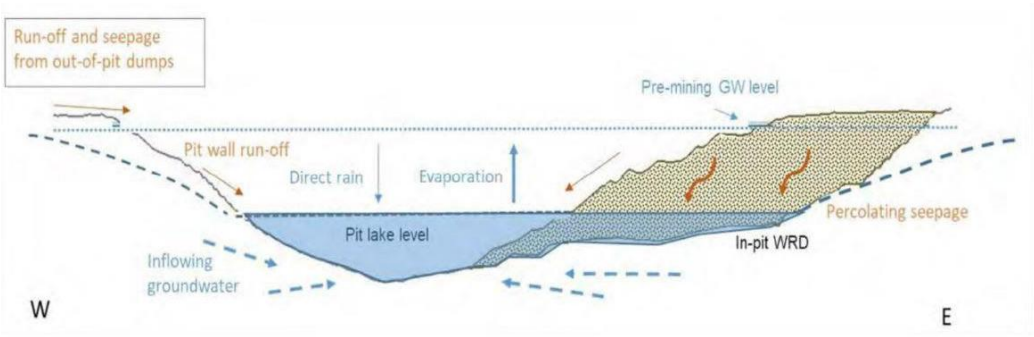


Figure 3-10: Schematic of typical pit lake sink

Rehabilitating Project infrastructure and mining activities is discussed in Chapter 8 Rehabilitation and closure.

3.5.2 Open cut mining equipment

The proposed open cut mining fleet will generally consist of rigid-body mining trucks loaded by hydraulic excavators.

The proposed main open cut mining fleet will likely include those listed the below—or an equivalent combination, depending on the contractor and mining fleet available at the time of operations:

- 200 t class excavator—primary mover (e.g. Hitachi EX1900 or similar);
- 100 t class excavator—additional capacity (e.g. Komatsu PC1250 or similar);
- 90 t class trucks x 5 (e.g. Caterpillar 777 or similar); and
- top-hammer diesel hydraulic drill (e.g. Epiroc FlexiROC T45 or similar) capable of drilling ø89mm to ø127mm blast holes.

Ancillary vehicles and equipment that are proposed to support the open cut mining fleet could include:

- tracked dozer (e.g. 1 x Caterpillar D10 or D9 and 1 x D8 or similar);
- grader (e.g. Caterpillar 14M or similar);
- water cart;
- wheel loader (e.g. Caterpillar 990 or similar) for ancillary loading and ROM rehandle to crusher;
- compactor;
- explosives truck;

- integrated tool carrier (e.g. Caterpillar 950 or 938 or similar);
- 4WD single and dual cab utilitys;
- 4WD troop carrier/ambulance;
- minibus;
- bobcat;
- rough terrain crane—15 tonne capacity; and
- forklift—2 tonne capacity.

Makes and models of equipment are representative only of the classes and sizes of equipment proposed, and the final selection will depend on financial analysis at the time of purchase.

3.6 Underground mine

3.6.1 Underground mining method

The underground mine will target the supergene material approximately 100 m below ground, extending to approximately 450 m (Figure 3-4). The conventional long-hole stoping with fill mining method will be used for the Project because it offers good resource recovery and a lower cost for mining, compared to other methods, given the narrow and flat-dipping ore body.

The underground mining target will be an average rate of 0.5 Mtpa, which may be up to one Mtpa in a year. The total lateral development is estimated to be 20.3 km, and the total vertical development is estimated to be 0.9 km.

Long-hole stoping will involve drilling and blasting with long holes, extracting the blasted ore to form stable open voids, or stopes, at regular intervals along the orebody. The dimensions of each stope will be dependent on the geotechnical conditions of the wall rock, the backs and the stress conditions.

Once the stable limit has been reached in one of the stope dimensions, the stope cannot be expanded further. The stopes will be filled to maintain stability and allow the adjacent ore to be extracted.

The general sequence of long-hole stoping with fill is described below and illustrated in Figure 3-11 and Figure 3-12.

- Drilling and blasting with long holes will be undertaken (Figure 3-11: Steps 1 and 2).
- The blasted ore will be ‘mucked’ out from the bottom of the stope (Figure 3-11: Steps 3 and 4). Efficient mucking depends on the blasted ore drilling to the drawpoint (Figure 3-12, Step 5).
- Completed stopes will be filled mainly using cemented paste fill (CPF) produced from tailings (Figure 3-12: Steps 6, 7 and 8). CPF will be the primary material used for backfilling; however, some supplementary backfilling will be done with underground waste rock.
- Waste rock generated from underground mining will supplement other backfill material.
- PAF_{HC} material will be prioritised as waste rock backfill material (refer to Chapter 6, Environmental assessment, Section 6.3 Geochemistry). This material will preferentially remain underground and be used for backfilling secondary stopes. Waste rock from the underground may be stored in the WRE for final emplacement. Managing other underground waste rock material is discussed in Section 3.9.2.5.
- Following processing at the Tritton processing plant, reclaimed dry tailings will be hauled back to the Project for screening and mixing with water and binder in a mobile paste backfill plant. An overview of the proposed CPF system is provided in Section 3.9.2.5.3.

Aeris will undertake further detailed geotechnical assessments on the design of the underground mine during the design phase prior to commencing underground mining.

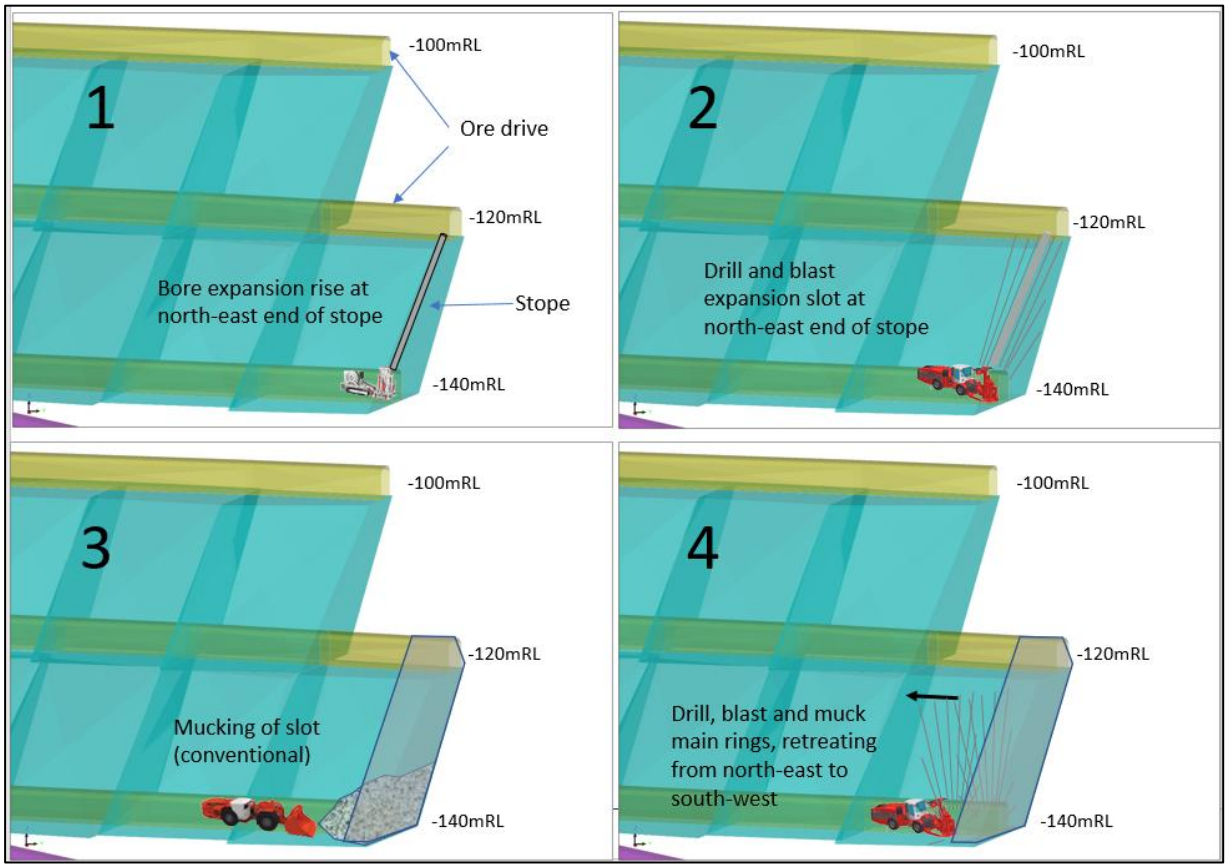


Figure 3-11: General sequence of long-hole stoping activities to initiate production

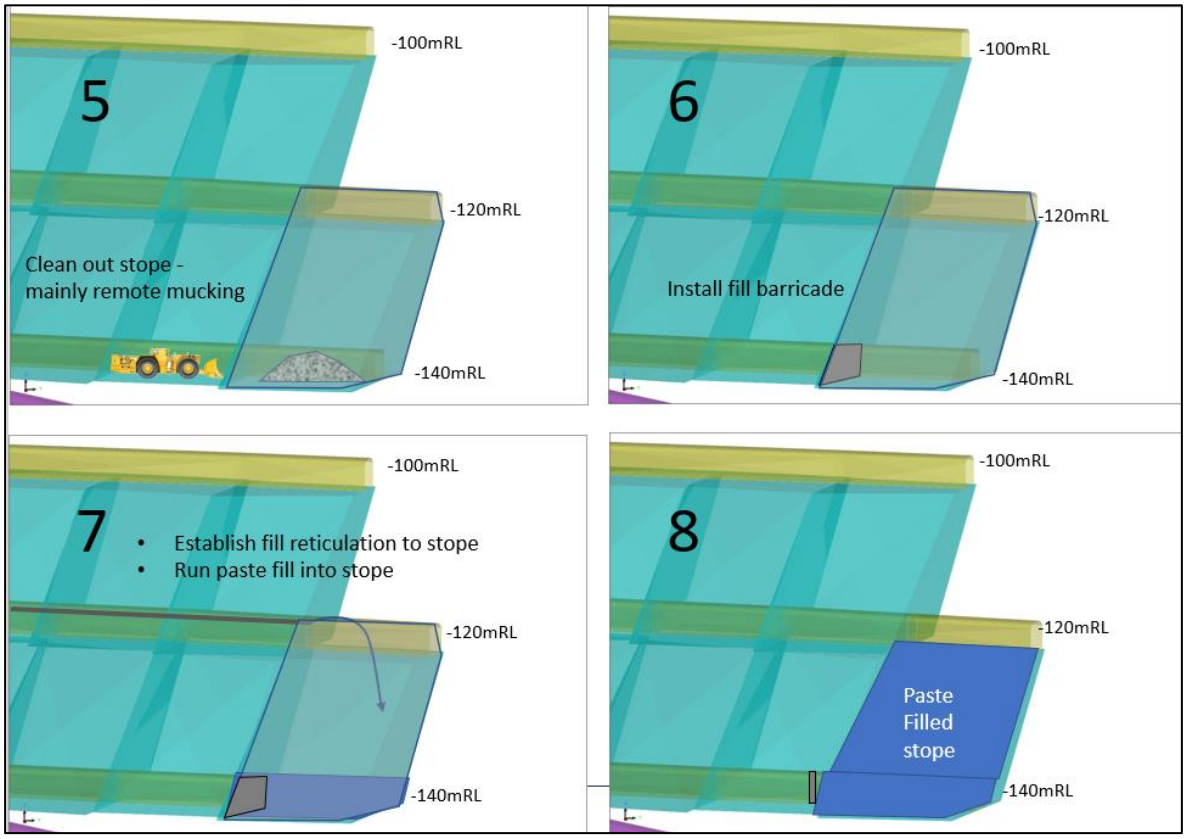


Figure 3-12: General sequence of long-hole stoping activities for filling

3.6.2 Underground mine dewatering

Water will flow into the underground mine from surface rainfall runoff into the box cut, groundwater and from water used in mine operations. The water will be collected in the mine at sumps on each level's main access. Electric, submersible pumps will pump the water to the main pumping stations equipped with settling tanks and Mono® pumps. They will pump the water up to the Mine Dam adjacent to the portal/box cut area via polyethylene (PE) pipelines.

After settling, the water will be used for dust suppression or other non-potable uses. Water quality will be monitored and treated as required.

Decline faces and other downgrade development faces will be dewatered with submersible electric face pumps that will remove water to the level sumps or directly to the main pump stations. A detailed underground dewatering design will be prepared during the design phase prior to commencing underground mining.

3.6.3 Box cut, portal, underground decline

Access to the underground mine is proposed to be via an underground decline and associated portal within the box cut pit (Figure 3-13). The box cut is proposed to be external to the open cut pit. The underground decline will enable personnel, mining equipment, materials and ore to be transported between the underground and surface. The box cut, portal and decline will be constructed at a similar time to the open cut pit (i.e. during the first year of operations).

The box cut will be constructed via conventional surface excavator and truck methods. Drill and blast techniques will be used in harder areas as required. The walls of the box cut will slope approximately 40°. The box cut roadway is proposed to have a 1:10 gradient down to the portal, being a gentler gradient than typical to allow for poorer conditions during inclement weather.

The portal floor is proposed to be 15 m below ground surface, providing 9.5 m of cover above the decline back of the portal. The portal walls will be near-vertical and be stabilised with substantial:

- rock bolting;
- cable bolting;
- meshing and
- shotcreting.

The portal will be constructed via drill and blast methods using typical:

- underground mining equipment;
- drilling jumbo;
- front-end loader;
- trucks; and
- other ancillary machines.

Ventilation will initially be provided by secondary ventilation fans and flexible ducting within the box cut. The area at the start of the decline will likely require intensive ground support, such as steel sets or similar. The underground decline is proposed to be approximately 5 m wide and 5.5 m high, with an approximate 1:7 gradient to the base of the mine. The overall length of the decline will be approximately 3.1 km.

Level accesses at approximately 20 m vertical intervals will be constructed. On each level, there will be a:

- truck loading bay;
- stockpile bays;
- a sump; and
- return ventilation access.

On each level, a single or dual (if required) ore drive will be developed on north and south of the main access crosscut. Mine loading bays will be required if the ore drive distance exceeds 120 m from the main access crosscut.

During construction and excavating of the underground mine, a fresh air ventilation system will be established from crosscuts off the main decline (refer to Section 3.6.4). Initially, the fresh air rise (FAR) will be used as a return air rise (RAR) until the return air rise is mined to 0 mRL.

An indicative underground design is shown in Figure 3-13 and Figure 3-14.

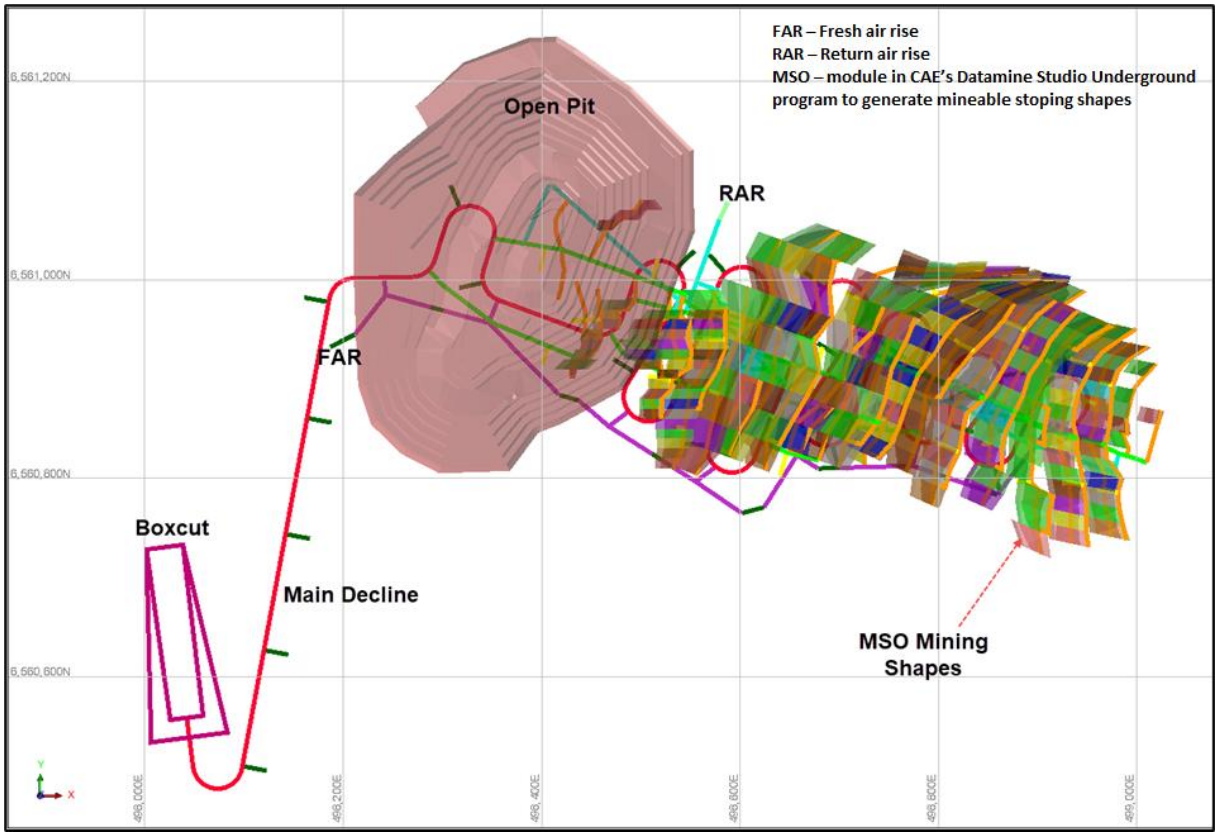


Figure 3-13: Open cut and underground design (plan view)

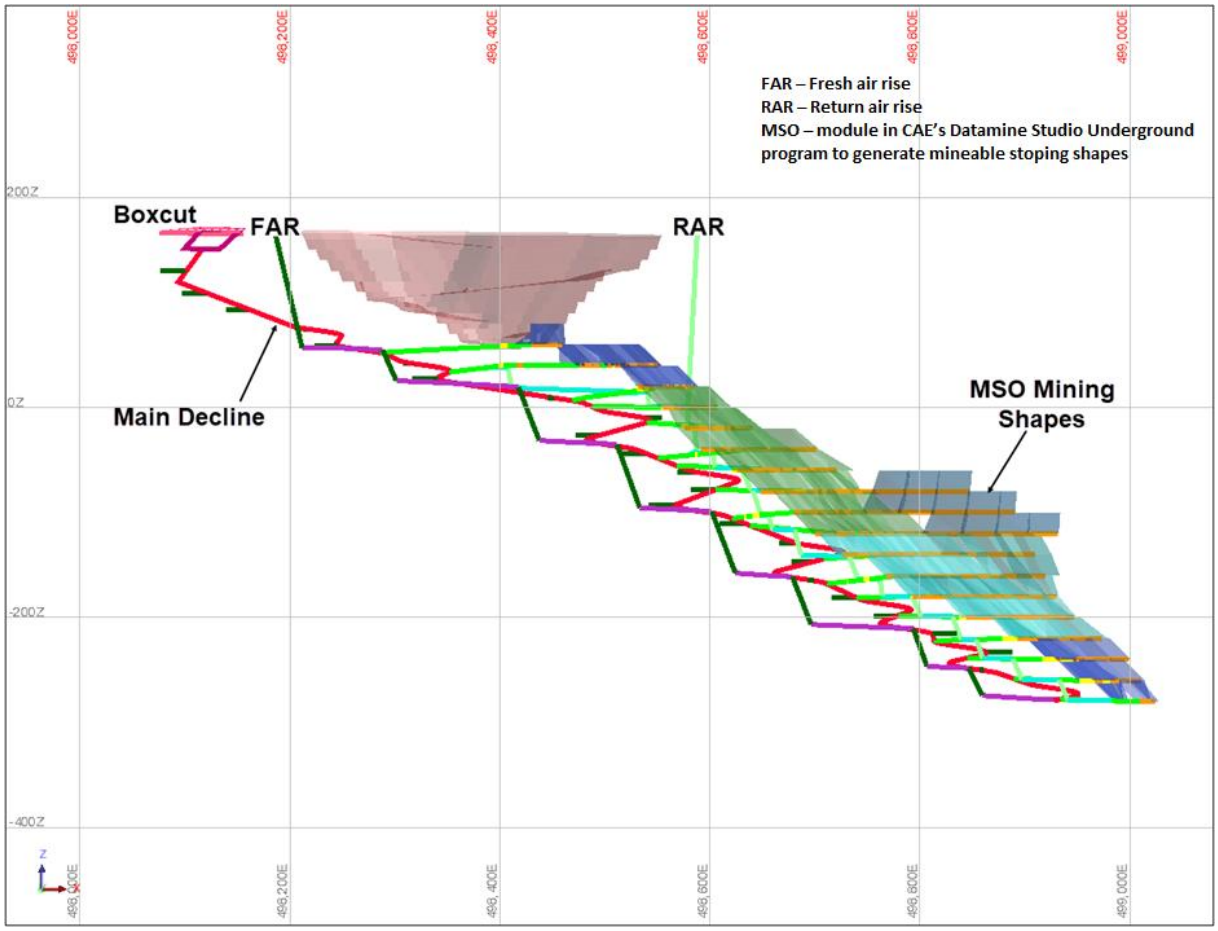


Figure 3-14: Open cut and underground design (cross-section looking north)

3.6.4 Underground ventilation system

The underground ventilation system will feature a primary and secondary network. The primary ventilation network will draw fresh air through the decline and FAR and exhausting return air via primary fans positioned at the collar of the main RAR on the surface. The two main surface ventilation rises will be positioned to provide sufficient separation from the proposed open cut pit and known adverse geological structures.

To ventilate each level, secondary fans will be hung in the main crosscut access to push air to each working face via flexible ventilation ducts. Return air from the working area will be exhausted through the RAR to the surface.

Constructing the ventilation shafts will use a range of equipment:

- a raisebore rig;
- a front-end loader; and
- supporting vehicles.

Rock material excavated from constructing the ventilation shafts will be removed to the surface for storage in the WRE for final emplacement or return to underground.

Detailed ventilation analysis will be completed during the feasibility study phase.

3.6.5 Underground mining equipment

The proposed underground mining fleet is industry-standard for productive mining operations:

- twin boom jumbos x 2 (e.g. Sandvik DD421 or similar) to develop headings;
- 17 t–21 t LHD units x 2 (e.g. Sandvik LH517/621 or similar) to remove blasted rock from all development headings and stopes and possibly to backfill stopes;
- 10 t LHD unit to assist the main LHD fleet;
- 45 t–50t trucks x 4 (e.g. Sandvik TH551 or similar) during peak production to transport broken rock from the underground to surface ROM or waste dump locations;
- long-hole drill rig (e.g. Sandvik DL421 or similar) to drill production blastholes;
- cable bolt drill rig (e.g. Sandvik DS421 or similar);
- box hole drill or alternative for stope expansion raises if required;
- dedicated charge-up unit;
- diamond drill rig;
- integrated tool carrier;
- shotcreter;
- grader;
- agitator truck;
- watercart;
- 4WD single and dual cab utilitys; and
- 4WD troop carrier/ambulance.

Makes and models of equipment are representative only of the classes and sizes of equipment proposed, and the final selection will depend on financial analysis at the time.

3.7 Project site infrastructure

In addition to the Project open cut mine pit and the underground mine, surface site infrastructure is described in this section.

3.7.1 Mine site haul roads

Mine site haul roads, as indicated in Figure 3-6, will be sized to industry-standard width according to the fleet contracted or purchased for the operations.

The Project plans for a 25 m wide haul road to cater for haulage trucks and other heavy vehicles. The main haul roads will be sized for 90 t open cut haul trucks with provision for dual lane travel of haul trucks, drainage and bunding.

The final constructed width will depend on final confirmation of open pit truck sizing. Underground haul road width will be less than that of the open pit haul road width and will be sized to suit underground trucks. In-pit ramps may use a single lane for some sections of the pit.

Mine site haul roads will be required for:

- ore and oxide haulage from the open cut to the oxide ore stockpile;
- supergene and primary ore haulage from the open cut to the ROM pad;

- primary ore haulage from the underground portal to the ROM pad;
- waste rock haulage from the open cut and underground to the WRE;
- movement of open cut heavy vehicles between the infrastructure area and the open cut and WRE;
- movement of B double vehicles dumping paste fill in the underground mine and circuiting back to the ROM pad; and
- movement of underground heavy vehicles between the underground facilities area and the underground portal, which will be constructed according to industry standards.

3.7.2 Run-of-Mine pad

The ROM copper ore handling and stockpiling area will be adjacent to the open cut pit ramp exits and underground portal.

Supergene and primary ore types from the open cut and underground operations will be hauled and stockpiled on the ROM pad.

ROM copper ore will be stored in separate fingers on the ROM pad according to processing requirements. The ore types will be reclaimed, loaded onto road trains and hauled to Tritton Copper Mine for processing. The schedule indicates that the maximum ROM stockpile required is approximately 0.5 Mt.

Oxide ore will not be stockpiled on the ROM pad. It will be stockpiled in the oxidised ore stockpile area adjacent to the heap leach area in preparation for heap leaching (as discussed in Sections 3.7.3 and 3.9.2.2).

3.7.3 Heap leach pad, agglomeration pad, oxidised ore stockpile, heap leach ponds

The Project proposes to maximise resource recovery by heap leaching an estimated 2.0 Mt of oxide ore at the Project site. This will improve the economic viability of the oxide material.

The heap leach facility will be adjacent to the oxidised ore stockpile. Ancillary infrastructure for the heap leach pad facility will include:

- a crushing circuit;
- an agglomeration pad;
- an SX plant; and
- six processing ponds (indicated as three water ponds in Figure 3-6) for managing the:
    - pregnant liquor solution (PLS);
    - intermediate leach solution (ILS); and
    - raffinate.

The heap leach process is outlined in Section 3.9.2.2.4.

3.7.4 Paste plant and stockpile area

A paste plant, stockpile area and emulsion storage will prepare the tailings for storage in the underground mine.

Backhauled trucks from Tritton Copper Mine will unload the tailings at the stockpile area (Figure 3-6). A paste fill will be made from the tailings. The paste plant will be positioned immediately above the orebody to permit gravity feed of paste into the underground mine. The required paste plant footprint is nominally 40 m x 40 m, and it will be a prepared tailings storage pad. Further detail is provided in Section 3.9.2.5.3.

3.7.5 Soil stockpiles

Topsoil, deeper subsoil and weathered regolith material, suitable for use in rehabilitation, will be stored separately as they are stripped from disturbed areas.

Four stockpile areas have been identified to store all the material that will be stripped from the site (Figure 3-6). It is estimated that the total stripped topsoil volume will be 1,520,00 m^3. Approximately 140,000 m^2 or 14 ha will be required for the topsoil stockpiles (with a 2.0 m height).

Topsoil and subsoil to be stripped from disturbed areas will be stockpiled and managed, as outlined in Section 3.9.1.1.

3.7.6 Other site facilities

The surface facilities at the Project mine site will include a contractor facilities area for the open cut mine and an Aeris office and underground facilities area (refer to Figure 3-6).

The contractor facilities area for the open cut mine will include infrastructures, such as:

- contractor buildings;
- workshop;
- washbay;
- tyre bay;
- fuel storage and dispensing;
- oil and lubricant storage and dispensing; and
- warehouse.

The Aeris office and underground facilities area will include infrastructures, such as:

- mine administration offices:
  - safety and training rooms;
  - environment and water management room;
  - heap leach and ore haulage office;
  - training room;
  - crib room;
- underground workshop;
- mine technical service offices for:
  - mine planning;
  - geology and grade control;
  - geotechnical;
  - surveys;
  - core shed;
- maintenance office;
- ablutions; and
- first aid and emergency services.

The locations for the mine facilities have considered operational requirements, such as access to the underground mine and the open cut pit, to minimise disturbance to surrounding native vegetation and cultural heritage values.

The underground mine will not be deep enough to warrant underground-located service facilities, such as workshops, meal rooms and fuelling stations. Service bays for routine servicing of slow-tramming drill rigs will be established.

3.7.6.1 Emergency facilities

Emergency facilities, including first aid and rescue, will be established at the Aeris office and include the following:

- emergency response vehicle;
- rescue equipment;
- firefighting equipment;
- breathing apparatus; and
- training equipment.

On-site emergency services will operate in conjunction with those of Aeris' Tritton Copper Mine and the NSW emergency services. They will respond to any emergencies in the open cut and underground mine workings, as well as surface mine facilities and the administration area, including emergencies involving:

- transporting and storing fuel;
- explosives; and other
- hazardous materials.

Refuge chambers will also be established in areas underground where personnel will have access to FAR infrastructure.

An underground escapeway will be constructed, such as a modular ladderway, providing a second means of egress if the primary means of egress is inaccessible.

3.7.6.2 Compressed air system in the underground mine area

A compressed air system will be installed to supply compressed air for:

- pneumatic equipment;
- clearing out holes;
- cleaning off blasting benches; and
- supplying air to underground mine refuge chambers that will be required as part of the mine's emergency management system.

The compressed air will be reticulated through the underground mine in a pipe appropriately rated for the pressure.

The surface workshops will also be equipped with smaller air compressors for the operation of:

- pneumatic wrenches;
- hoists;
- tyre inflaters; and
- lubrication systems.

3.7.6.3 Communication system

A comprehensive and efficient communication system will be installed throughout the surface and underground mine using the most up-to-date technology and similar systems used at other Aeris operations to, facilitate operational and response requirements:

- emergency communications and response;
- traffic management;
- integrated infrastructure control;
- breakdown and maintenance information, including condition monitoring;
- blasting clearance and control;
- equipment and personnel location; and
- vehicle, refuge chambers and key infrastructure communications.

An optic fibre cable will be buried in a trench in the infrastructure corridor for communication and data transfer between the Project mine site and the Murrawombie Copper Mine.

3.7.6.4 Explosives storage and manufacture areas

The Project will require appropriate storage facilities for bulk explosives, packaged explosives and storage of detonators in accordance with relevant standards and regulations.

The storage facilities will be required for the open cut and underground operations and will include appropriate security fencing and safety bunds.

Explosives storage arrangements and decisions about the need for ammonium nitrate storage and an explosives manufacturing plant on-site will be resolved in accordance with current explosives supply to the Tritton Copper Mine and its other satellite mines.

Provisional locations for the explosives magazine and storage of ammonium nitrate, including emulsion, are shown in Figure 3-6. There is a separation of approximately:

- 500 m between the ammonium nitrate emulsion storage area and the eastern side of the open cut; and
- 1,500 m between the ammonium nitrate emulsion storage area and the mine facilities area.

Separation areas and locations for the explosive storage areas will be designed in accordance with AS 2187 Explosives–Storage, transport and use, considering the following factors:

1) type of explosives or agents stored;
2) quantity of explosives/agents stored;
3) type of facility that is the subject of concern (e.g. office area, power station, processing facility); and
4) access, transport and security.

3.7.6.5 Shotcrete batch plant

There will be a shotcrete batch plant to prepare concrete for the underground mine. The shotcrete batch plant will be in infrastructure area 7 in proximity to underground activities in an area nominally 40 m x 40 m.

3.7.6.6 Electricity supply infrastructure

Electricity to the Project will be available via mains power generated in the Project mine site. Power will be generated by a solar PV system (solar farm) and diesel genset(s).

During construction, the Project will operate with diesel power generation. Once the solar farm has been built in the first year of construction (Project Year 0), it will contribute to power generation. The total surface power requirement is estimated to peak at 1.7 MW, excluding power for the heap leach operations.

The diesel genset(s) will be sized to support the full load on-site. During operations, it is expected that the Project will operate with solar power during the day and diesel genset at night. If required, grid connection will occur by aerial powerlines along the haul route.

An electrical substation will be built on-site to provide electricity to the underground mine via an 11 kV aerial powerline. It will also initially provide power to the adjacent underground portal to supply power (1,000 V) to fans, pumps and jumbo starter boxes. An 11 kV ring main system will be developed as the underground development advances, which will be fed from an 11 kV portal substation. As underground mining progresses, substations (11 kV to 1,000 V) will be constructed, with each servicing up to four levels. It has been estimated that the total power consumption for underground mining will be approximately 3 MW:

- including allowances for the paste plant and surface workshop; and
- excluding offices, open cut and open cut workshop.

3.8 Water management

This section describes water use requirements and infrastructure that will be used to supply and manage water for the Project.

A site-specific water management plan outlining regulatory requirements, consent conditions, monitoring and quality management will be prepared and implemented to ensure water quality is suitable for appropriate reuse.

3.8.1 Water use requirements

A site water balance model was prepared to estimate the volume of water required over the life of the Project. Water inputs and outputs in Table 3-4 summarise the water demands for the Project.

Water requirements have been estimated for the first year of open cut mining, Year 4 of underground mining and the peak water demand year (Table 3-4). Total annual peak water demands for the Project are estimated to be 613 ML/yr (Year 4). Further details relating to water demand and the water balance model are in Appendix 5, Water impact assessment.

Construction water demands will be for:

- dust suppression;
- vehicle washdown; and
- materials, such as concrete.

Operational water demands will be for:

- staff amenities;
- underground mining operations;
- dust suppression;
- ore processing;
- heap leach;
- pre-concentrator;
- paste fill/concrete batch plants; and
- vehicle washdown.

Table 3-4: Annual average water balance summary

Water Management Element	Year 1 Annual Transfers (ML/year)	Year 4 Annual Transfers (ML/year)
Inputs		
Direct rainfall	46	34
Catchment runoff	127	127
Groundwater inflows	105	194
Transfer from the Murrawombie Copper Mine	66	258
Total inputs	**344**	**613**
Outputs		
Evaporation	97	95
Uncontrolled off-site discharge	0	0
Dust suppression, potable water/irrigated treated sewerage effluent from amenities, vehicle wash down, paste fill plant, pre-concentrator use, heap leach loss, ore moisture loss	186	481
Transfer to Murrawombie Copper Mine	5	0
Underground ventilation losses, underground seepage loss	0	64
Total outputs	**288**	**640**

3.8.2 Water supply

Sources of water for the Project during operations include:

- Rainfall;
- Runoff;
- groundwater inflows into the workings; and
- water supplied from the Murrawombie Copper Mine using a bi-directional water pipeline between the Murrawombie Copper Mine and the Project.

The Project water management system has been designed to include reticulation of contaminated water to satisfy the site water demands, such as heap leach and paste fill plant water usage. If no reticulation were implemented, the frequency of off-site discharges from dirty and contaminated water storages would likely increase.

The average in the peak water demand year (Year 4) is 258 ML, represented as inflows from the Murrawombie Copper Mine.

The cumulative annual total probability distribution of water from the Murrawombie Copper Mine for the peak water demand year (Year 4) is presented in Figure 3-15. The cumulative volume required from the Murrawombie Copper Mine in the peak water demand year is unlikely to exceed 359 ML.

Water demands during pipeline construction will be met by:

- capturing incidental rainfall and runoff in the Project water management system; and
- water truck deliveries from the existing Tritton Copper Operations.

Mine water for surface operations will be supplied from the Project's raw water dam via PE pipe to specific infrastructure:

- pre-concentrator plant;
- washdown area;
- paste plant;
- amenities; and
- dust suppression (Figure 3-15).

The water management system has been designed to include reticulation of contaminated water to satisfy water demands, such as heap leach and paste fill plant water usage.

Water for dust suppression by water truck will be supplied from a standpipe at the raw water dam, as well as via the pipe from the raw water dam.

Mine water will be supplied to the underground mine by a pipeline from the Project's raw water dam. It will be distributed underground using a network of PE pipe via the decline and fed to the levels.

Pressure reduction devices will be installed at regular depth intervals as required to maintain water pressure within pipeline specifications.

The water will be used underground for:

- drilling;
- cleaning out blast holes;
- washing down faces and benches;
- washing down muck piles;
- dust suppression;
- equipment cleaning, and
- general washdown and cleaning activities.

No production bores have been planned for construction at this stage, given local groundwater sources are expected to be low yielding near the Project orebody. However, production bores are an option for supplementing water supply and will be investigated if required.

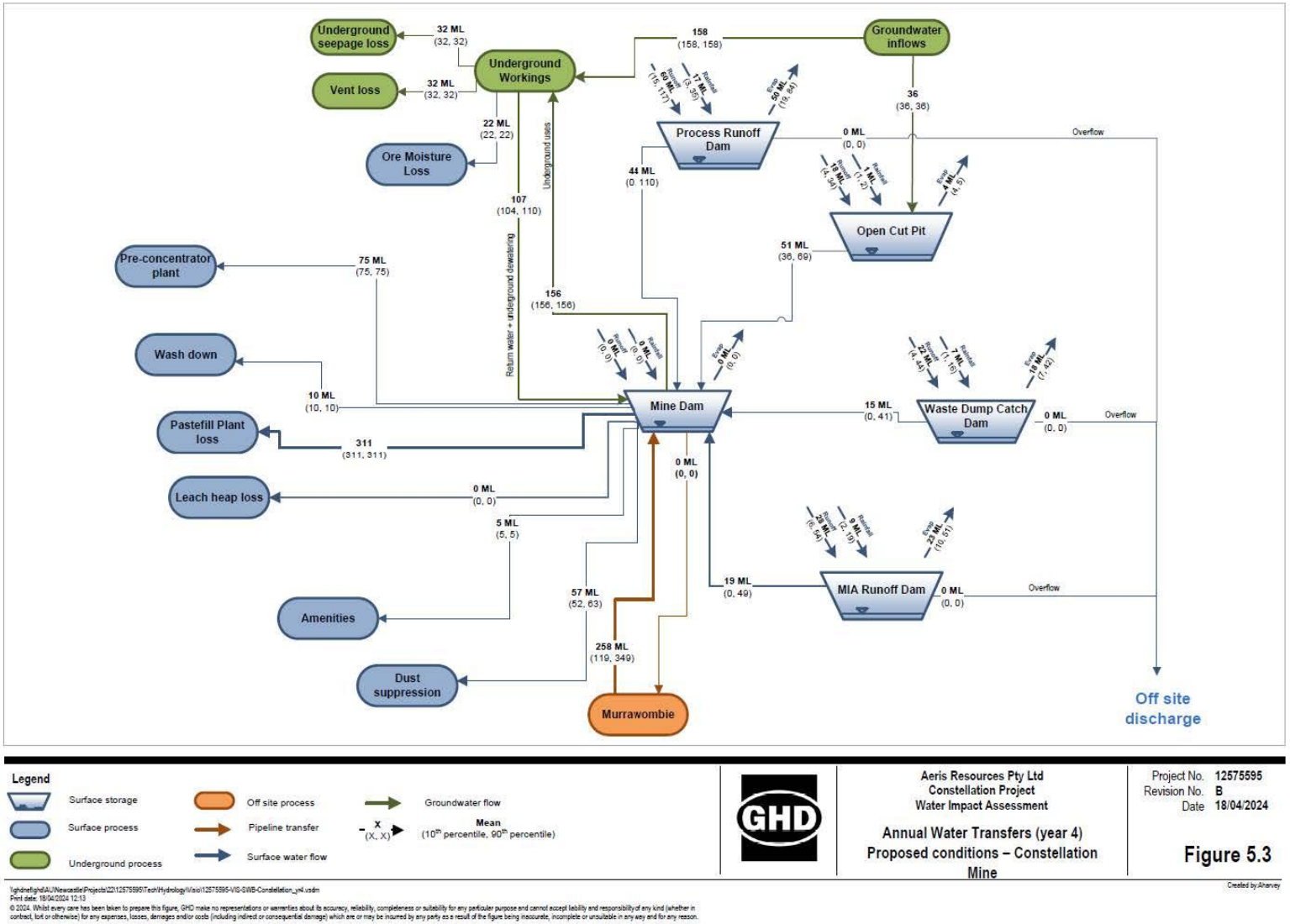


Figure 3-15: Annual water transfers (Year 4 peak water demand year)

3.8.3 Water supply pipeline

Off-site water supply will be required to meet operational water demands when a water deficit occurs on-site. External water would be required when water sources, such as rainfall, runoff or groundwater interception, cannot meet site demands. Supply will be via a bi-directional pipeline between the Project and the Murrawombie Copper Mine. The pipeline will be approximately 31 km, and the alignment will follow the off-site access/haul road, as described in Section 3.4.2. Two pump stations would be required at each end of the pipeline at the Murrawombie Copper Mine and the Project.

The bi-directional pipeline would also be used to recirculate water from the Project to the Murrawombie Copper Mine to minimise water use.

The water pipeline would use existing water management infrastructure and water licensing associated with the Murrawombie Copper Mine, as water demands during operations at the Murrawombie Copper Mine decline.

Water supplied to the Murrawombie Copper Mine sourced from the Lower Bogan River Water Source is licensed by three water access licences (WALs). Cumulatively, the mine is authorised to extract 931 units/ML of water from the Lower Bogan River.

An existing pumping station on the Bogan River, approximately 24 km east of the Murrawombie Copper Mine, pumps water under licence to the Murrawombie Copper Mine where it is stored in a raw water dam. A water supply pipeline is proposed to connect the Project mine site to the existing raw water supply at the Murrawombie Copper Mine.

During the maximum water demand year, no water transfer from the Project to the Murrawombie Copper Mine will be required, as water captured in the Project water management system will likely satisfy the site water demands.

During the minimum water demand year, the maximum simulated water transferred from the Project to the Murrawombie Copper Mine is estimated to be approximately 38 ML.

Groundwater inflows to Aeris operations are taken under three WALs from the Lachlan Fold Belt MDB groundwater source. The water available under these licences form part of the water balance for Murrawombie and may be available to be supplied to the Project via the pipeline. The groundwater take for the Project will also be under these WALs.

3.8.4 Site water management infrastructure system

Water management infrastructure to manage clean water, dirty water and mine-affected water is discussed in the following sections.

The proposed water management strategy (Figure 3-16) seeks to minimise the incidental capture of clean water by utilising clean water diversions upgradient of the disturbance area. At the same time, dirty and mine-affected water from disturbed or mining process areas in contaminated water capture drains and storages will be collected to prevent discharge of that water from the Project site.

3.8.4.1 Clean water management

Clean water, being surface runoff from catchment areas upgradient of the disturbance area, will be diverted around the site without treatment, when practicable. In accordance with the WM Act, no surface water harvesting of clean water is proposed. No additional clean water is proposed to be acquired.

Two open clean water diversions are proposed to the north and south of the site (Figure 3-16) to divert water around the disturbance area. It is likely these clean water diversions would be developed during the construction phase, prior to other works being undertaken to minimise down gradient catchment areas, which will later become disturbed.

3.8.4.2 Dirty water management

Dirty water, being surface runoff from areas of disturbance, will generally occur during construction activities. Five dirty water drains are proposed within the site to divert dirty water during the construction period. The proposed site water storages would act as dirty water or sediment basins during the construction phase. During the operational period, these drains would intercept contaminated water flows and divert these to the site water storages (Figure 3-16).

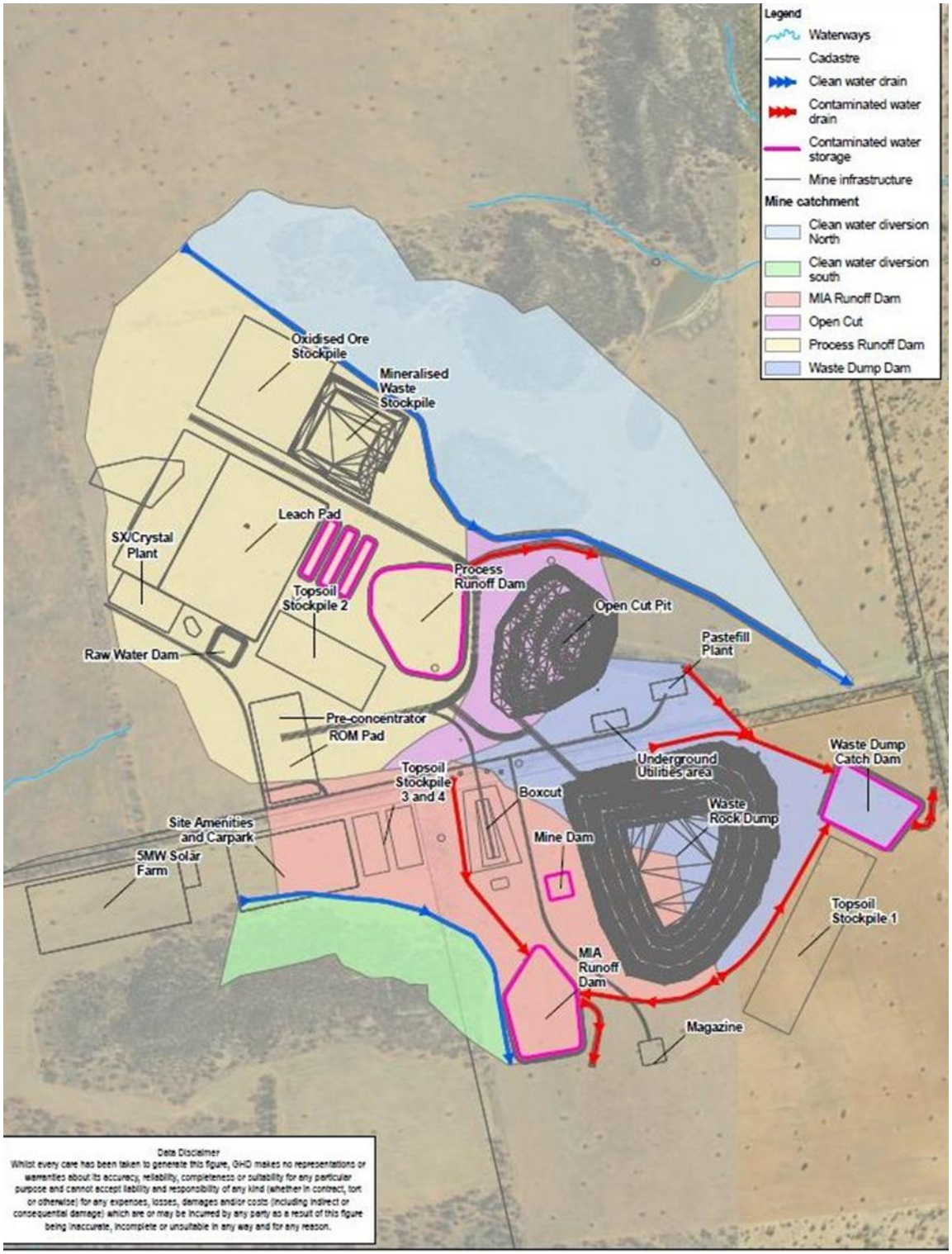


Figure 3-16: Water management system

3.8.4.3 Contaminated water management

Contaminated (processed, or mine-affected) water is categorised by the increased likelihood of elevated concentrations of dissolved metals from contact with ore and waste rock. Contaminated water also includes water that is potentially impacted by acid from the ore extraction process or hydrocarbons. The contaminated water management system has been designed to mitigate the risk of contaminated water discharging from the Project site (Figure 3-16).

Processing facilities will be placed upgradient of the pit to ensure overflow is captured by the contaminated water management system during heavy rainfall; facilities such as:

- heap leach pad
- SX/Crystal plant
- pre-concentrator
- ore, and
- waste stockpiles

The contaminated water management system will capture contaminated water in contaminated drains and direct these flows to the contaminated water storages, specifically the:

- Mine Dam;
- Process Runoff Dam;
- Waste Dump Dam;
- MIA Runoff Dam; and
- heap leach ponds.

The system has been designed as nil discharge (with the maximum practicable design criteria) to minimise the potential for off-site discharge of potentially contaminated water. The specific design measures are:

- Hydraulic capacity diversion drains for clean water and dirty water capture drains will contain the design peak flow for the 1% AEP design rainfall event.
- An environmental containment freeboard will contain the design runoff volume for the 1% AEP, 72-hour duration design rainfall event. The Process Runoff Dam, Waste Dump Dam and the MIA Runoff Dam are each sized to contain this design rainfall event.
- The Mine Dam is a turkey nest dam design with a nominal capacity of 10 ML for operational purposes. The Mine Dam will be operated with a freeboard to contain direct rainfall.
- Pumps will recirculate contaminated water for appropriate reuse from contaminated water storages that are intended to reduce the likelihood of off-site discharges.

The capacity, and catchment area of each contaminated site water storage are shown in Table 3-5.

Table 3-5: Water storages

Storage	Capacity (ML)	Catchment area (ha)
MIA Runoff Dam	116.5	63.4
Process Runoff Dam	249.1	124.6
Waste Dump Dam	90.2	50.7
Mine Dam	10 (nominal)	Direct rainfall only

Contaminated runoff from the following areas will be diverted to the site water storages (Figure 3-16):

- Runoff from the MIA will be directed to the MIA Runoff Dam, including surface flows from the workshop, washdown bay, laydown area, topsoil stockpiles and carpark.
- Runoff from the WRE will flow to either the Waste Dump Dam or the MIA Runoff Dam via a contaminated water drain.
- Runoff from the processing area may be potentially contaminated by interacting with ore stockpiles and heap leach piles. These flows will be directed to the Process Runoff Dam.
- Runoff from the box cut will flow down the decline and be dewatered as part of the underground dewatering system for the Mine Dam. An internal contaminated water drain will direct catchment runoff to the MIA Runoff Dam to minimise the volume of water intercepted by the box cut.

Contaminated process water leached from the heap leaching processes will be captured in the heap leach ponds. This includes the PLS, ILS and raffinate ponds. The system has been designed so that if wet weather conditions cause the heap leach ponds to overflow, the overflow will be captured by the Process Runoff Dam.

Excess water is expected to be transferred off-site via the pipeline and sent to the Murrawombie Copper Mine when required. This would be triggered when site water management structures are at a triggering threshold (i.e. 80% full or some other site-defined value). While the site water management infrastructure has been designed as nil discharge (including through pumped transfers to the Murrawombie Copper Mine), off-site discharges from site water storages may still occur in rainfall events exceeding the 1% annual exceedance probability.

Project water impacts have been assessed in Chapter 6, Environmental assessment, Section 6.5.9, Water management measures.

3.8.5 Sewage treatment

Wastewater would be generated from staff facilities and construction activities. Release of wastewater off-site would potentially result in elevated nutrient levels. Wastewater would therefore be collected for treatment and on-site disposal or reuse.

Sewage from the administration buildings and bathhouse will be conveyed by gravity to an aerated wastewater treatment system. Wastewater will be treated through several phases. Treated effluent will be disposed of on-site via irrigation or to an evaporation trench.

A water treatment plant is proposed to manage potable water and wastewater with a volume of 5 ML/yr.

Disposal methods (such as discharge to an evaporation trench) and monitoring programs will be undertaken in accordance with EPA (2004) and ANZECC/ARMCANZ (1997 and 2000). The effluent will be monitored to ensure it meets the standards before discharge or reuse for irrigation.

3.9 Project schedule and staging

The Indicative Project schedule is based on Project years in preference to calendar years. The Project stages are outlined in Figure 3-17. Each stage is described in further detail in Sections 3.9.1 to 3.9.3.

Project Stage	Activity	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Construction	Site surface and infrastructure corridor																
	Underground mine																
Operating	Open cut mining																
	Underground mining																
	Ore feed to Tritton Processing Plant																
Closure and Rehabilitation																	

Figure 3-17: Project stages and Project activities (years)

Construction activities are scheduled to commence in 2025 (Year 0–Year 1), subject to completing all required Project approvals.

All surface construction activities are estimated to be completed in a 12-month period, inclusive of site construction and the infrastructure corridor for the road and pipeline development activities. Proposed construction activities are detailed in Section 3.9.1.

Underground construction activities will commence indicatively in Year 1 (Figure 3-17) by developing the box cut and portal, decline and underground workings. Underground mining operations will commence in Year 2.

The open cut pit will be developed indicatively in Year 1 during the development of the underground mine. Open cut pit operations will commence in Year 1 (Figure 3-17), and it is estimated to be operating for just over two years (into the start of Year 3).

The Project's open cut pit and underground mineral resources are expected to support production for approximately ten years, commencing indicatively in Year 1. There is potential for mine life extensions as the deposit is developed at depth underground. The first ore feed to the Tritton processing plant is scheduled to occur in the fourth quarter of Year 1 from the open cut pit.

Decommissioning and final rehabilitation activities will be completed during an estimated 5-year period at the end of the Project's operational life in Year 11 (indicatively 2036–2037). Rehabilitation will occur progressively when possible. For further detail, refer to Section 3.9.3.

3.9.1 Construction stage of the Project

Project construction activities will include developing:

- site preparation, including clear and grade and earthworks for all pads, including the MIA and surface infrastructure (Section 3.9.1.1);
- the 2,850 m section of the new road for site access to bypass Girilambone town and upgrading existing roads in the infrastructure corridor (Section 3.9.1.2);
- the underground water supply pipeline between the Project mine site and the Murrawombie Copper Mine in the infrastructure corridor (3.9.1.2);
- water management infrastructure, including clean water diversions, dirty water diversions and water storage facilities and pipelines (3.8.4);
- buildings and installing the heap leach facilities, paste plant, stockpile area and the other site facilities, such as offices and emergency facilities, laydowns, solar farm and power station, explosives storage area identified in Section 3.7; and
- the box cut and portal to enable underground access development, then the decline and underground workings, the underground ventilation system and underground mining infrastructure (Section 3.6).

A description of key Project construction activities, additional to the details referred to, is provided in Sections 3.9.1.1 and 3.9.1.2.

3.9.1.1 Project mine site area roads, pads and preparatory earthworks

Access roads, haul roads, laydown areas and other preparatory earthworks will be constructed during the first year of the Project (Year 0). Surface preparatory works for the roads and pads to support the infrastructure will include:

- **Erosion and sediment control:** The main sediment and water controls, including clean water diversions, will be installed prior to any vegetation or soil being disturbed. Erosion control and sediment containment structures will be operational and maintained until vegetation established.
- **Vegetation clearing:** Vegetation will be cleared immediately prior to topsoil stripping.
- **Topsoil management:** Topsoil of suitable quality as growth medium will be used in site rehabilitation activities, typically to a depth of 200 to 300 mm. It will be stripped from the surface infrastructure footprint by a scraper, excavator, bulldozer, loader and truck as appropriate. A water cart may be used for dust suppression.

  Topsoil will be stockpiled separately from other soil sources and managed in accordance with soil management, stockpiling and re-application procedures developed for the Project (refer to Chapter 6, Section 6.1, Soil and land capability and Chapter 7, Mitigation and management).
- **Subsoils and regolith stripping and stockpiling:** These materials will be stripped and stockpiled separately. Stockpiled material, including topsoil, that will be in excess to rehabilitation requirements on-site would be transferred to the Murrawombie Copper Mine for rehabilitation use.
- **Haul roads:** These will be constructed and maintained using a grader and water cart. Construction will also include using a scraper, excavator, bulldozer, loader, compactor and trucks . An appropriate traffic management plan will be implemented to address safe haulage in dry and wet weather, focusing on but not limited to:
  - speed limits;
  - intersections;
  - bends and lines of sight;
  - gradients; and
  - separating heavy vehicles and light vehicles.

  Quarried material may be moved from the Murrawombie Copper Mine for use on roads and hard stands, as required. Excess material may be transferred to the Murrawombie Copper Mine from the Project when available.

3.9.1.2 Construction site access and haul road

Access from the Mitchell Highway to the Project mine site will generally be via existing roads. However, a new section of road will be required to be built that will intersection the Mitchell Highway, approximately 800 m north of Girilambone.

The road, including the new 2,850 m section and the Mitchell Highway/new haul road intersection with its short channelised right-turn lane, will be constructed, as shown Attachment 4. The new road will be an unsealed road, consistent with the existing Okeh Road. The water supply pipeline and optic fibre cable will be constructed in a trench adjacent to the road, and they will traverse under the haul road in the infrastructure corridor.

Intersection upgrades will be completed for the Mitchell Highway/Railway Road intersection to optimise road safety for operational traffic and other road users.

Upgrades will include a short channelised right-turn lane on the approach to the Railway Road from the Project site. Some site preparation and road widening will be needed to accommodate these intersection upgrades (refer to Attachment 4, Road intersections).

Upgrades to the existing Okeh Road (from the intersection of the new road, north to the Project mine site) will be completed to accommodate Project haulage activities. This will include some road widening to provide an 18 m infrastructure corridor width throughout the Okeh Road section.

Opportunities to further reduce the extent of clearing (e.g. through the use of safety barriers around large trees) will be reviewed during detailed design development.

The road will be constructed and maintained in accordance with industry standards. An appropriate traffic management plan will be implemented prior to construction to address the life of the Project, including:

- construction
- maintenance
- operation; and
- decommissioning.

The management plan will also address safe haulage in dry and wet weather, focusing on but not limited to:

- speed limits;
- intersections;
- bends and lines of sight;
- gradients; and
- separation of heavy vehicles and light vehicles when necessary.

During road construction and upgrade activities, construction traffic and deliveries to the Project will be via Okeh Road and through Girilambone for a limited time (indicatively 6 months).

3.9.2 Operations

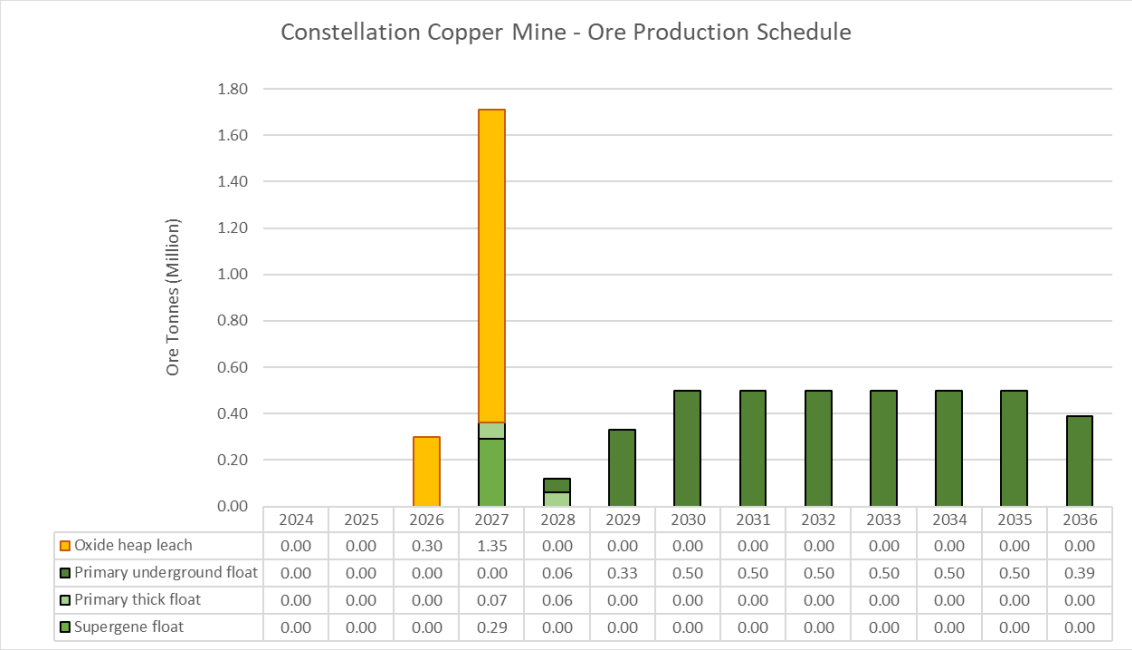
3.9.2.1 Mining schedule and sequence

The Project mineral resource spans a considerable range of depth, from oxide mineralisation starting within 10 m below the ground surface to primary mineralisation at a depth of nearly 500 m below ground surface. The upper part of these resources is amenable to open cut mining. However, as the strip ratio increases with depth, the open cut mining cost per tonne of ore increases and underground extraction becomes more economically favourable. Mining methods for open cut and underground mining are discussed in Sections 3.5.1 and 3.6.1.

Developing the underground mine will commence when the open cut pit is operating, enabling underground operations to continue once the open cut pit is completed. The mining of the open cut prior to the underground will provide initial mill feed until the underground mine is developed. An overview of the proposed mine schedule for the Project's underground and open cut mining operations is presented in Figure 3-18. The potential mining inventories in the open cut and underground mining areas are approximately 3.6 Mt and 2.4 Mt respectively for a total potential mining inventory of approximately 6 Mt. The provisional mine schedule and sequence is based on maintaining a total annual product output of approximately 0.5 Mt.

Commencing with open cut mining operations, the lower-grade ore will be placed on the oxidised ore stockpile, then stacked on to the heap leach pad. Processing of the lower-grade ore is discussed in Section 3.9.2.2.4.

Mined supergene/chalcocite ore will be hauled from the underground mine and stockpiled on the ROM pad for crushing (Section 3.9.2.2).



	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Oxide heap leach	0.00	0.00	0.30	1.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Primary underground float	0.00	0.00	0.00	0.00	0.06	0.33	0.50	0.50	0.50	0.50	0.50	0.50	0.39
Primary thick float	0.00	0.00	0.00	0.07	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Supergene float	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Figure 3-18: Mining production schedule

3.9.2.2 Processing

3.9.2.2.1. Crushing and screening

Supergene, primary and high-grade ore will be crushed and screened on the ROM pad. The crushing and screening of ore will be undertaken between the open cut contractor facilities area and the ROM pad.

Copper ore stockpiled on the ROM pad will be reclaimed and blended at determined ratios to optimise downstream processes. A conventional mobile crushing circuit will be used to crush mined ore to a maximum size of 100 mm, with crushed ore stockpiled on a coarse ore stockpile. The coarse ore will be used as feed for the pre-concentration facility (refer to Section 3.9.2.2.2) or trucked to the Tritton processing plant at the Tritton Copper Mine.

3.9.2.2.2. Pre-concentration

The pre-concentration facility will be located adjacent to the ROM pad. Pre-concentration options are being evaluated as they may increase resource recovery and upgrade ore feed grades of material trucked to the Tritton processing plant. Coarse particle flotation for pre-concentration will be used and is described as follows:

- Crushed ore will be fed into a dry grinding circuit for further size reduction, targeting a maximum partile size of 500µm.
- Ground ore will be combined with water to create a slurry and pumped to the flotation circuit. The flotation process will use a pH modifier (hydrated lime), collector (potassium amly xanthate) and frother (methyl isobutly carbinol) to recovery valuable minerals to the froth concentrate. The pre-concentration process will also recover gold and silver from the Project ore.
- Flotation concentrates will be dewatered through a filtration system, targeting a moisture content of 10% (w/w). Concentrates will be trucked to the Tritton mill for additional processing.
- Flotation tailings will similarly be dewatered through a filtration system targeting a moisture content of 10% (w/w). Tailings will be utilised as underground backfill, removing the need for a tailings storage facility.
- Filter filtrate water will be recycled back to the process water circuit.

- Tailings will be hauled to the paste plant.

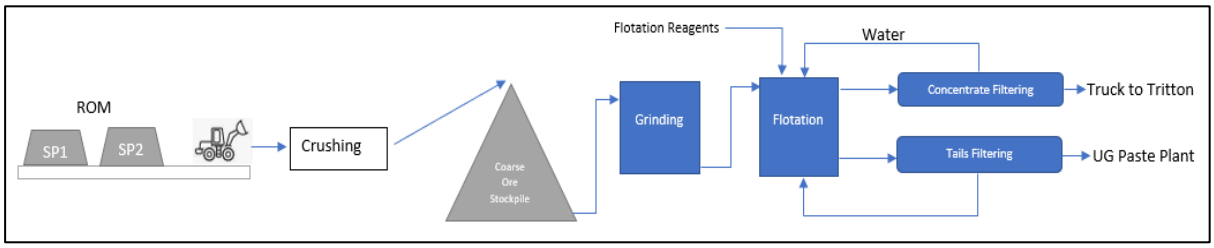


Figure 3-19: Indicative pre-concentration process

3.9.2.2.3. Off-site processing

Tritton Copper Operations aims to maintain copper ore feed to its existing processing plant at a rate of up to 1.8 Mtpa. Ore from the Project will contribute to the feed at an average rate of 0.5 Mtpa, peaking at one Mtpa (refer to Chapter 1, Introduction, Section 1.6.1).

Methods for copper ore processing at the Tritton processing plant will remain unchanged. Over the life of the Project, an estimated 4.19 Mt of ore will be processed off-site at the Tritton Copper Mine processing plant.

Copper ore stockpiled on the ROM pad at the Project will be loaded onto road-registered trucks, sized up to AB triples with 70 t payloads. The road trucks will transport the copper ore to the Tritton processing plant along the road infrastructure (detailed in Section 3.4.3). This will include the proposed haul route and the existing approved haul route currently used by the Avoca Tank Copper Mine and Murrawombie Copper Mine. Road trucks will operate 24 hours a day, seven days a week, four truck movements an hour, with a maximum of 82 movements per day (refer to Chapter 6, Environmental assessment, Section 6.15 for details on Project traffic).

Processing of Project ore at the Tritton processing plant will occur under separate approvals held by the Tritton Copper Mine; therefore this is not in the scope of the Project EIS. This includes managing tailings produced from processing the Project ore at the Tritton processing plant.

Tailings generated from the Project will be managed in the existing tailings storage facility (TSF) at the Tritton Copper Mine, with some tailings being backhauled to the Project to use as underground backfill (Section 3.9.2.5.3).

Processed concentrate will be transported to the port via rail from Hermidale rail siding near the Tritton Copper Mine (refer to Section 3.11).

3.9.2.2.4. Heap leaching

All oxide ore, estimated at 2.0 Mt, will remain on the Project mine site for handling and processing in the heap leach pad and facility (refer to Section 3.7.3 for heap leaching facilities).

The ore in the proposed heap leach pad will not contain sulphide minerals, so the acid mine drainage (AMD) risks posed by this material are much lower than heap leach pads that do contain residual sulphide minerals.

The base of the pad will be prepared with fine material (a maximum size of 38 mm and a moderate to high fine content [200 mesh] of at least 20%) to prevent any damage to the liner to be laid on the pad. The base will be graded and rolled flat and designed with sufficient slope angles to facilitate drainage across the pad to the treatment ponds. The conceptual design (Figure 3-20) features a nominal 1.0° lateral slope from the north to the south, flowing to the PLS pond.

The HDPE liner will be a minimum 1.5 mm thick and installed by a suitably qualified contractor. During installation and prior to use, the liner will be inspected for weld integrity and punctures. A leak detection system will be installed under the liner. The launders at the end of the cells will be lined to enable the leachate to flow freely to the PLS ponds. Weekly inspections of the liner and leak detection system will be undertaken. The heap leach pad design will incorporate up to three lifts (approximately 8 m each) with a maximum design

height of 24 m. The slopes will incorporate an overall angle of no greater than approximately 21° for protection/stability during rainfall events. The rehabilitation and closure of the HLP landform are described in Chapter 8, Rehabilitation and closure.

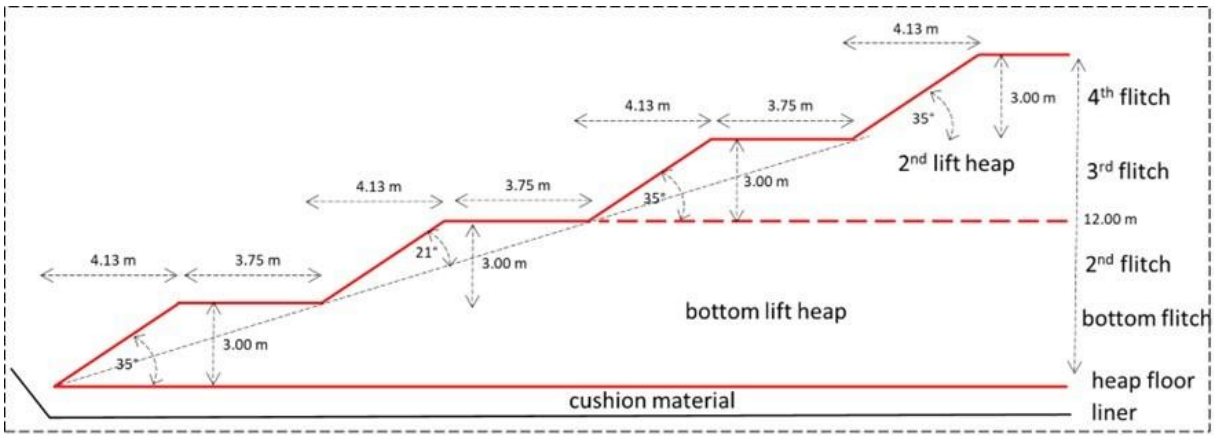


Figure 3-20: Conceptual design of heap leach pad

The heap leaching process is summarised as follows:

1) At the heap leach area, oxide ore will be placed in a stockpile from where it will be reclaimed by front-end loaders and crushed and placed on the heap leach pad by a stacker or dump truck.

2) At the heap leach facility, a modular agglomerator will be used as required to pre-treat crushed ore with sulphuric acid and water prior to stacking on the heap. This will cause the ore to form into porous lumps, known as agglomerates, that have better leaching characteristics than non-agglomerated ore.

3) Crushed ore will be stacked on the heap leach pad according to the final stacking sequence, stacking in sections 90 m x 300 m and moving east to west (Figure 3-20). On completion of the first lift at approximately 12 months and after spent-heap surface preparation, stacking will recommence for the second lift heaps. Similarly, the third lift will stack on top of the second lift after spent-heap surface preparation.

4) Once a panel has been filled with ore to the desired height, the conveying and stacking system is moved laterally to commence stacking the next panel, and the pipework through which solution is applied to the heap is placed onto the heap surface.

5) The process of leaching or solubilising the copper in the ore is carried out in two stages:

    a) a dilute sulphuric acid solution with a pH of approximately two and a low copper concentration (raffinate) will be pumped from the raffinate pond (Figure 3-6) and used to irrigate ore panels that have already been partially leached. The runoff from the panels contains an intermediate concentration of copper–ILS.

    b) the ILS is collected in a storage pond before being pumped back to the heap and used to irrigate fresh ore panels not previously leached. The runoff from the fresh ore panels contains copper, known as PLS, and is collected in another pond adjacent to the ILS pond prior to being pumped to the solvent pond adjacent to the ILS pond and to the SX processing plant.

    The six ponds to be used for the heap leaching process (PLS, ILS and raffinate) are shown in Figure 3-6.

6) Raffinate is used to irrigate the heap leach. Sulphuric acid is added to the raffinate pond to increase the acid concentration, and it will be pumped onto the heaps through dripper lines and/or wobbler sprinkler systems at targeted rates (i.e. 10L /m2 /h). The rate varies depending on:

    a) pump capacity;

b) pressure of dripper lines;

c) distance between dripper lines;

d) pressure loss along riser mains; and

e) permeability of the heap to the raffinate.

Regular daily inspections and weekly maintenance of the irrigation system may be required.

7) The leaching of the copper from the ore takes place as the sulphuric acid solution percolates through the ore stacked on the heap. Oxide ore is acid leached and sulphide ore is ferric leached by the action of bacteria. The length of time required for the leaching process depends on the grade of the ore and ambient temperature.

8) Solvent extraction will occur using an SX plant with four mixer-settlers, two electrolyte filters and a crud treatment area. Copper-enriched leachate solution will be stored in the PLS ponds and pumped through the SX circuit for processing. The SX circuit will concentrate and purify the leachate solution through a two-staged extract and strip process. Once the solution has completed this circuit, the advanced electrolyte will proceed to the copper sulphate crystalliser circuit for further processing. Reject solution from the extract stage will be used to recommence irrigation of the heap leach pads once more H_2SO_4 (sulphuric acid) has been added to the solution.

9) As copper crystal production declines, the feasibility of installing a copper cementation plant at the heap leach facility will be assessed. The plant would be used to replace the product from the SX crystal plant. The process would utilise standard industry practices and methods.

3.9.2.3 Hazardous substances

The hazardous substances used by the Project mainly include hydrocarbons, chemicals and explosives. Fuel will be stored on-site in fuel tanks for the open cut and underground fleet, general site light and heavy vehicles, and power generators.

A preliminary list of the hazardous substances, storage type and storage capacity is provided in Chapter 6, Environmental assessment, Section 6.11, Hazards and safety, and Appendix 13, Preliminary hazard analysis.

3.9.2.4 Non-mining waste management

Non-mining waste generated by the Project may include waste tyres, fuel, scrap food, and scrap construction materials. Based on the Waste Classification Guidelines (EPA 2014), waste identified across the Project stages has been classified into:

- special waste;
- liquid waste;
- hazardous waste;
- general putrescible solid waste; and
- general non-putrescible solid waste.

The existing waste management plan for Tritton Copper Mine will be revised to include the proposed management of waste generated from the Constellation Project.

Non-mining waste and its management strategies are discussed in Chapter 6, Environmental assessment, Section 6.10, Non-mining waste.

3.9.2.5 Waste rock management strategy

The Project will selectively manage and store waste rock material from the open cut pit and underground mine. The mine material, balance by a geochemical class for the combined open pit and underground operations (Table 3-6), estimates that there are 6.1 M Loose Cubic Metres (assuming 2.7 specific gravity (SG) and a swell factor of 1.35) of waste rock.

Geochemical analysis results indicate that most of the waste rock samples analysed are acid consuming (AC) or non-acid forming (NAF). The block model indicates there will be approximately 6.4% combined potentially acid forming–high capacity (PAF_{HC}) and PAF mine waste and 10.5% potentially acid forming–low capacity (PAF_{LC}) mine waste. The PAF_{LC} mine waste is only marginally PAF (Table 3-6).

Approximately 83.1% of the mine materials are NAF, estimated to be 52.1% non-acid forming–low capacity (NAF_{LC}), 18.9% NAF or 12.1% AC (Table 3-6). Further details are provided in Chapter 6, Environmental assessment, Section 6.3 Geochemistry, and Appendix 15, Geochemical and pit lake modelling assessment report.

Table 3-6: Volumetric breakdown of open pit and underground waste rockby geochemical classification

Geochemical Classification		In-situ volume BCM	Bulked volume LCM	% of Total
AC	Acid Consuming	546,907	738,324	12.1%
NAF	Non-Acid Forming	855,011	1,154,264	18.9%
NAF_{LC}	NAF (Low Capacity)	2,351,840	3,174,984	52.1%
PAF_{LC}	Potentially Acid Forming (Low Capacity)	474,455	640,514	10.5%
PAF	Potentially Acid Forming	176,736	238,593	3.9%
PAF_{HC}	Potentially Acid Forming (High Capacity)	112,326	151,640	2.5%
	Total	4,517,274	6,098,320	100%

Waste rock generated from the open cut pit will be managed in the proposed WRE (Section 3.9.2.5.1). A small proportion of NAF waste rock may be crushed into construction aggregate to use as a road base, sheeting and blast hole stemming.

Competent NAF rock from the open pit will be utilised for the construction of water drains within the mine area and on the WRE, such as rock armouring some slopes to maximise stability and minimise erosion.

AC waste rock may be used at the heap leach pad as part of closure planning activities.

Management of waste rock from the underground mine will vary during the life of the Project. During the initial development of the underground mine, underground waste rock will be hauled to the surface and stored in the WRE, as the stope voids will be inadequate to place uncemented waste rock fill. PAF (PAF and PAF_{HC}) materials generated from underground mining operations will be placed:

- within the WRE PAF cells (while the open pit is in operation);
- within the base of the open pit void (following the cessation of open pit mining); or
- preferentially utilised for the backfill of underground stopes.

NAF materials, competent AC and NAF rock will be retained in a separate stockpile for rehabilitation and ancillary purposes. The NAF material may be blended with PAFLC to encapsulate PAF and PAFHC cells and form growth medium layers of the WRE. The ancillary purposes for NAF materials may include:

- road construction (including the required upgrade of Okeh Road);
- transport to other Aeris mine sites;
- other off-site uses when deemed suitable; and
- construction of laydown yards, drainage structures and rock armouring (for slope stability).

The specific use of materials will be subject to assessments of their suitability as required. The proposed rehabilitation strategy for the Southern WRE is discussed in Chapter 8, Rehabilitation and closure.

3.9.2.5.1. Waste rock emplacement

The WRE will be constructed to a maximum height of approximately 45 m high (205 RL), composed of up to five lifts and have a footprint of approximately 33 ha. It will have a capacity of approximately 6.1 million cubic metres and be able to contain all mine waste from the open pit and underground mine and mine rehabilitation materials (AC, NAF and NAF_{LC} regolith and rock units).

The proposed design of the WRE includes five benches, the lowest with a 5 m lift and the remaining with 10 m lifts (Figure 3-21). The maximum height and shape of the WRE will be similar to surrounding hills.

The following management measures will be implemented to manage risks associated with PAF materials:

- Prior to placing waste rock materials, excavation and mechanical compaction of base materials (after the topsoil and subsoil are removed) will be required to "key-in" the WRE and slope the excavated floor towards the open pit. The intent of this is to direct all seepage through the WRE into the final void.
- Operational procedures will be developed to assess and identify waste materials as either NAF or PAF according to the definitions in Appendix 15, Geochemical and pit lake modelling assessment report.
- Operational procedures will be developed to ensure PAF and NAF materials are segregated and selectively handled so there is no cross-contamination or errors made in the handling and placement of materials.
- A 5 m layer of NAF material will be placed at the base of the WRE before placing PAF_{HC} and PAF material.
- The PAF_{HC} waste is the most reactive and will be contained with PAF waste in the centre of the WRE (Figure 3-21) and covered with a 0.5 m thick low permeability seal (10-8 m/s.) (subsoils) and trafficked to achieve 95% standard Proctor compaction. PAF materials are to be placed in lifts to optimise mechanical compaction.
- PAF_{LC} will be blended with NAF and used as cover material.
- The top of each cell may be shaped to a 3-–5% grade. It will then be sheeted in compacted (trafficked) clay-rich subsoil to maximise lateral, rather than vertical, movement of water inside the WRE so that toe and basal seepage is reduced. When possible, the low permeability seal may be sloped to shed any seepage waters to the north to facilitate passive post-closure flow of seepage towards the open pit (i.e. north of the natural watershed).
- PAF material is to be preferentially contained in the centre of the WRE and not extend under any shaped batters.
- The PAF waste will be covered by a minimum of 3 m NAF mine waste (blended with PAF_{LC}) and placed vertically above the encapsulated PAF cell.
- Outer surfaces, including the top tier, will have a 2 m store and release soil cover system (achieving a total cover of > 5 m).

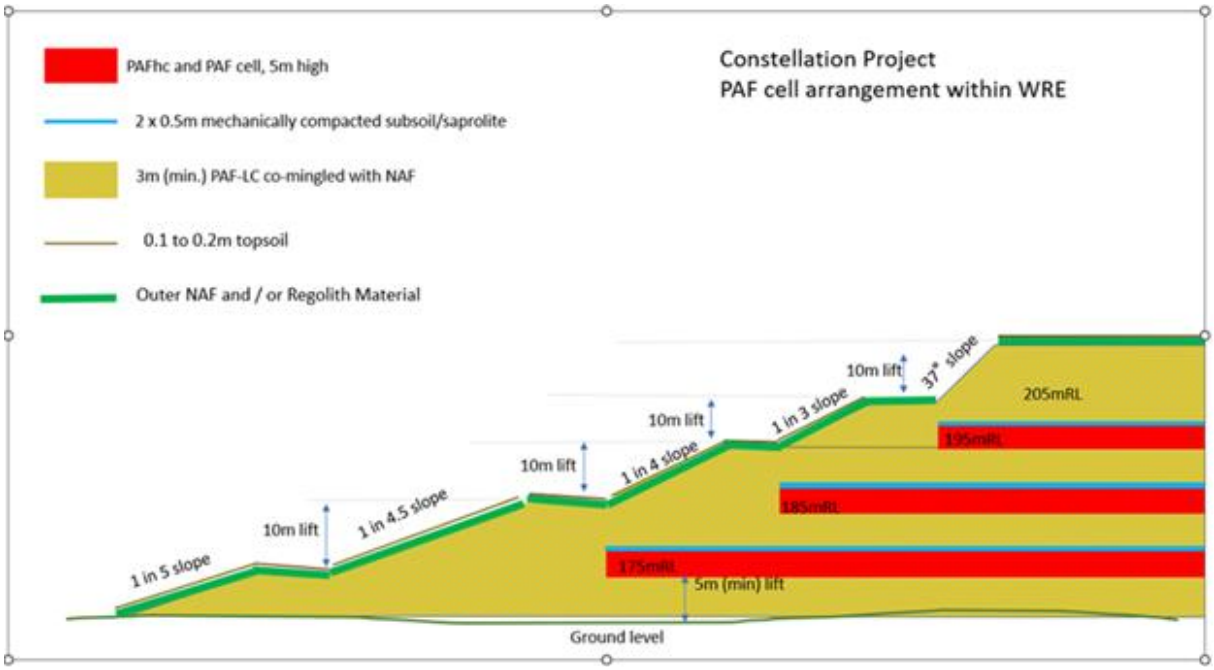


Figure 3-21: WRE landform design

3.9.2.5.2. Mineralised waste stockpile (MWS)

The MWS will store low-grade mineralised (oxide) material, which at some stage in the future may be viable for placement on the heap leach pad for metal extraction.

The MWS will be constructed to a maximum height of approximately 25 m and occupy an unrehabilitated footprint of approximately 7.4 ha (Figure 3-22).

The MWS material will be a low-grade 'oxide ore' that does not contain elevated sulphides, so there is negligible risk of generating AMD conditions.

Risks associated with the closure and rehabilitation of the MWS include the ongoing release of seepage (containing elevated metals, such as copper) from the MWS and inability to establish a stable landform capable of sustaining vegetation in the long term. Management measures for these risks are included in Chapter 8, Rehabilitation and closure.

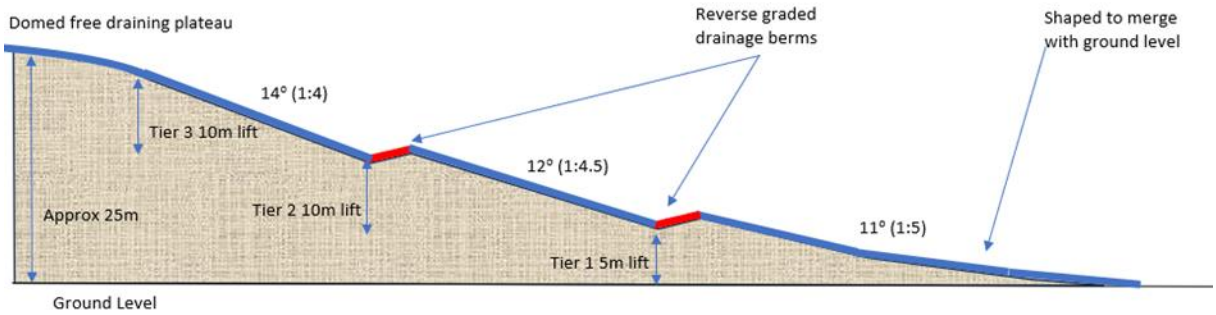


Figure 3-22: MWS landform design

3.9.2.5.3. Cement paste fill

Tailings from the Tritton processing plant (and potentially the pre-concentration facility) are proposed to be prepared as CPF to backfill the underground stopes at the Project underground mine. Backfilling the

underground stopes using CPF has the advantages of providing flexibility in stope sequencing and reducing mine wastes to be managed at surface.

The Project proposes to backhaul 50% (approximately 1.5 Mt) of reclaimed dry tailings from the Tritton processing plant, while approximately 50% of the Project tailings will be contained in the future lifts of the Tritton Copper Mine TSF (Figure 3-23).

After backhauling to the Project site, tailings will be stored temporarily on a prepared tailings storage pad (refer to Figure 3-6 and Section 3.7.4). Only a small quantity of tailings will be stored at any one time due to the potential for tailings oxidation. Given a typical stope volume in the order of 3,000 m^3 no more than 5,000 m^3 of tailings will be stored at the Project site. The stockpile height will be approximately 3 m.

The tailings storage pad will typically have the following engineered vertical construction profile:

- an engineered under-drainage layer at the base;
- approximately 1 m of crushed rock (to assist drainage) in a different colour to the tailings laid above the drainage layer;
- approximately 1 m of tailings over the rock layer (ideally low sulphide material) to protect operators from bogging the crushed rock; and
- the tailings stockpile placed above the tailings layer.

Stored tailings at the Project will be prepared as CPF using a mobile paste backfill plant. The mobile paste backfill plant will be used to screen and mix these tailings with water and a binder.

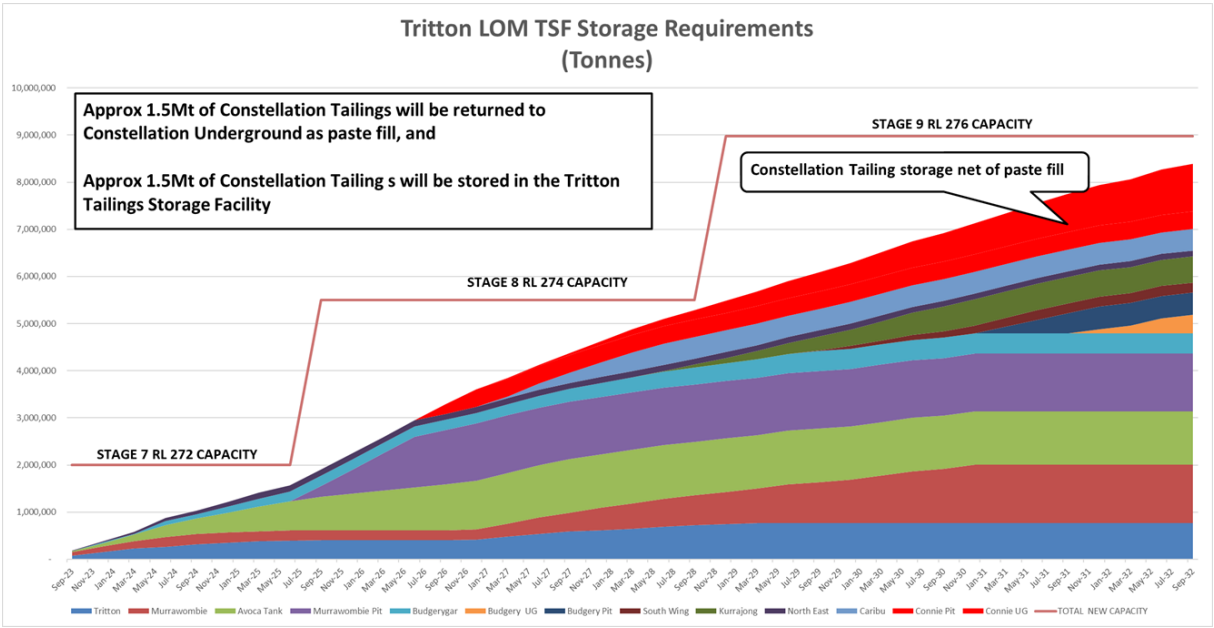


Figure 3-23: Estimated volume of tailings at Tritton Copper Operations

3.9.3 Closure and rehabilitation

Decommissioning and final rehabilitation activities will be completed during an estimated five-year period at the end of the Project's operational life. Disturbance caused by the Project will be small in scale, with approximately 170 ha available to rehabilitate.

Rehabilitation will occur progressively during the operational phases of the Project when possible—this will include large portions of the WRE. During operational phases, the viability of metal recovery from the MWS will be considered. Should a decision be made that the MWS will not be processed, it and the oxidised ore stockpile

and agglomeration pad may be available for early rehabilitation. The remainder of the surface infrastructure will be required for the active mine life and will be decommissioned and rehabilitated from year 11 onwards.

Chapter 8, Rehabilitation and closure provides information on:

- post-mining land uses;
- landforms and rehabilitation objectives;
- progressive rehabilitation; and
- rehabilitation methods.

3.10 Workforce

There will be a two workforces required for the Project:

- a construction workforce; and
- an operational workforce.

3.10.1 Construction workforce

A construction workforce of up to 95 personnel is expected during the Project construction phase (Table 3-7), involving:

- civil works;
- site buildings and infrastructure construction;
- boxcut, portal and decline development; and
- equipment assembly.

The construction workforce is likely to include:

- earthmoving and heavy equipment operators;
- structural steel and welding trades workers;
- geologists, project managers, safety officers, engineers and environmental scientists;
- carpenters, scaffolders, painters, plumbers and electrical trades workers;
- concreters; and
- construction, mine tunnelling and mining labourers.

Table 3-7: Estimated total workforce during construction

Labour	Total (FTE)
Direct (on-site construction workforce)	90
Indirect (client/project management)	5
Total	**95**

3.10.2 Operational workforce

An annual average of 178 FTE positions is expected during peak operation times. A breakdown of the operational workforce is provided in Table 3-8.

Table 3-8: Estimated total workforce during operation

Labour	Annual Average at Peak (FTE)
Mining	117
Transport	23
Processing	38
Total	**178**

3.10.3 Workforce accommodation

For those in the Project workforce who do not live locally, accommodation will be available at the Tritton Copper Mine village during operations.

Based on historical and current workforce statistics from the existing Tritton Copper Mine operation, it is expected that within the operating phase of the Project, the following situations may apply:

- Approximately 49% of the workforce will be DIDO/FIFO primarily from the NSW Central Coast regions and reside in the accommodation village.
- Approximately 51% of the workforce will choose to reside in surrounding local communities, including Cobar, Nyngan, Hermidale and Girilambone
- Currently the accommodation village has 30 single units, as well as recreation and dining facilities. A Nyngan motel can provide a further 49 rooms on a permanent basis, some with double accommodation but all single occupancy. This totals 79 rooms.

3.10.4 Rostering

Construction rosters are expected to be based on 12-hour shifts:

- Surface construction activities will generally be undertaken 24 hours a day, seven days a week.
- Drift and shaft sinking activities will operate 24 hours a day, seven days a week.
- Blasting activity will be limited to daytime hours.

Operation rosters will be based around two rosters, depending on the work roles. There will be a seven-day, four-panel roster for operators, direct supervisors and maintenance. A four-panel roster is an equal-time roster requiring one crew on the day shift, one crew on the night shift and two crews on days off.

Throughout the operations phase of the Project, operating hours will be 24 hours a day, seven days a week. Operational employees will work industry-standard 12-hour shifts on their seven-day roster cycles.

Management, technical services, clerical and support staff will operate on a five days on, two days off roster.

3.10.5 Workforce transport

During the peak period of the construction phase, 25 vehicles (23 light vehicles and two buses) per day will be inbound in the morning and outbound in the afternoon.

During operations, it is expected that 65% of staff will use staff shuttle buses to commute to and from the Project site. Operational personnel will commute to the Project by four shuttle buses, including:

- a 12-seater shuttle running return from Nyngan;
- a 9-seater shuttle running return from Cobar; and
- two 48-seater coaches running return from Nyngan (via the Tritton Copper Mine).

Some workers will travel by private vehicles, with some carpooling expected. For further details on traffic generation during construction and operations, refer to Chapter 6, Environmental Assessment, Section 6.15 Transport.

FIFO personnel will use air transport to and from the Project site or the accommodation village. Dubbo airport is the nearest airport.

3.11 Transporting ore, tailings and product

The ore extracted from the Project site will be hauled on the proposed haul roads to the Tritton processing plant via private and public roads. Existing road networks will be used as much as possible. The tailings generated during processing at the Tritton processing plant will be backhauled to the Project site on the same haul roads. The construction of the haul roads is discussed in Section 3.4.3.1.

The operational haul route is proposed to cross a railway corridor. However, the existing rail line (former Main Western Railway) from Nyngan Junction to Byrock is currently not being used (refer to Chapter 6, Environmental assessment, Section 6.15, Transport). Therefore, vehicles accessing the nearest state road (Mitchell Highway) from the proposed haul road will not pass over any operational level crossings.

The haul route, traffic generated during the construction and operational stages of the Project and transport impacts are described in Chapter 6.15, Environmental assessment, Section 6.15, Transport.

Concentrate from the Tritton processing plant will be trucked to Hermidale rail siding and loaded onto rail to transport to Newcastle Port. Copper crystal will be loaded and transported from the Project by either road or rail.

The existing rail networks are expected to provide enough transport capacity for the Project. Therefore, no new rail or port facilities will be required.

Appendix B: Updated statutory compliance table

Statutory Reference	Statutory requirement	Section Addressed
Consideration under the EP & A Act and Regulations		
E&P Act: Objectives Section 1.3	To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the state's natural and other resources.	Section 2
	To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.	Section 6
	To promote the orderly and economic use and development of land.	Section 6.12
	To protect the environment, including the conservation of threatened and other species of native animals and plants and ecological communities and their habitats.	Section 6.5
	To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	Section 6.10
	To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government.	EIS Chapter 5, Section 5.2, Authority to grant approval
	To provide increased opportunity for community participation in environmental planning and assessment.	EIS Chapter 4, Engagement, Section 5
EP&A Act: Evaluation Section 4.15	A consent authority must consider the provisions of any relevant environmental planning instruments. For the proposed Project these include: • State Environmental Planning Policy (Resources and Energy) 2021; • State Environmental Planning Policy (Planning Systems) 2021; • State Environmental Planning Policy (Resilience and Hazards) 2021 • State Environmental Planning Policy (Transport and Infrastructure) 2021; and Bogan Local Environmental Plan 2011.	EIS Chapter 5 Section 5.5, Pre-conditions to exercising the power to grant approval EIS Chapter 5, Section 5.6, Mandatory matters for consideration EIS Chapter 2, Section 2.4.3, Bogan LEP
	Any relevant development control plan must be considered (e.g. the Bogan Shire Council Development Control Plan 2012).	EIS Chapter 2, Section 2.10 in the State Environmental Planning Policy (Planning Systems) 2021 provides that development control plans do not apply to an SSD.

Statutory Reference	Statutory requirement	Section Addressed
	Any planning agreement that has been entered into under Section 7.4 or any draft planning agreement that a developer has offered to enter into under Section 7.4.	EIS Chapter 2,Section 2.7, Planning agreements
	The EP&A Regulations (to the extent that they prescribe matters for the purposes of this paragraph).	EIS Chapter 5, Section 5.2, Authority to grant approval
	The likely impacts of the development, including environmental impacts on the natural and built environments and social and economic impacts on the locality.	EIS Chapter 6, Environmental Assessment, Section 6
	The suitability of the site for the development.	EIS Chapter 2, Section 2.4, Land use planning considerations
	Any submissions made in accordance with the EP&A Act or Regulations. **Note:** This EIS will be exhibited for public comment as part of the statutory approval process under the EP&A Act.	EIS Chapter 5,Section 5.2, Authority to grant approval
	The public interest.	EIS Chapter 2, Strategic Context
Considerations under Environmental Planning Instruments (EPIs)		
State Environmental Planning Policy (Resilience and Hazards) 2021	Part 3, Section 3.12, Matters for consideration by consent authorities The proposed Project is considered a 'potentially hazardous industry' for the purposes of the SEPP (Resilience and Hazards) 2021. Before granting consent to a potentially hazardous industry project, a range of factors, including a Preliminary Hazard Analysis prepared for the Project, must be considered.	EIS Chapter 6, Section 6.11, Hazards and safety; Appendix 13, Preliminary hazard analysis, Section 1.4 EIS Chapter 8, Rehabilitation and closure
	Chapter 4, Section 4.6, Contamination and remediation to be considered in determining development application Before granting consent to a mining project, potential existence of contaminated land must be considered. The proposed Project is not within an area identified to be contaminated land (based on searches of the NSW EPA Contaminated Land Record).	EIS Chapter 6, Section 6.1, Soil and land suitability; Section 6.1.4.3, Land use and vegetation Section 6.1
Bogan LEP Part 7, Additional local provisions	**Section 7.4, Terrestrial biodiversity** Development consent must not be granted on land identified as having biodiversity sensitivity, unless the consent authority is satisfied that potential impacts to terrestrial biodiversity values will be avoided, minimised and/or mitigated. Small areas of the Project site have been identified as having 'Moderate Biodiversity Sensitivity' (Bogan LEP 2011).	EIS Chapter 6, Section 6.7, Biodiversity; EIS Appendix 2, Biodiversity development assessment report, Section 6.5 and Appendix D4

Statutory Reference	Statutory requirement	Section Addressed
	Section 7.9, Essential services Development consent must not be granted unless the consent authority is satisfied that any of the following essential services are available, or that adequate arrangements have been made to make them available when required: a) the supply of water; b) the supply of electricity; c) the disposal and management of sewage; d) stormwater drainage or on-site conservation; and e) suitable road access. Potential impacts associated with these matters have been considered in various Sections of this EIS.	EIS Chapter 3, Project description EIS Chapter 5, Section 5.4.3.5, Water management act EIS Chapter 6, Section 6.10, Non-mining waste; Section 6.10.6, Waste management strategies EIS Chapter 6, Section 6.5, Surface water EIS Chapter6, Section 6.15, Transport.
Considerations under other legislation		
	Native Title Act 1993 (Cth)	EIS Chapter 5, Section 5.4.3.1
	Climate Change Act 2022 (Cth)	EIS Chapter 5,Section 5.4.3.2
	Climate Change (Net Zero Future) Act 2023	EIS Chapter 5,Section 5.4.3.3
	Biodiversity Conservation Act 2016	EIS Chapter 5,Section 5.4.3.4
	Water Management Act 2000	EIS Chapter 5,Section 5.4.3.5

Appendix C: Updated mitigation measures table

No.	Commitment
General	
G1	A Construction Environmental Management Plan will be prepared for the construction phase of the Project to mitigate impacts on soil and water.
G2	The management of spills will include measures to manage and contain accidental spills, including maintaining materials such as spill kits.
G3	Where possible, potential sources of contamination will be removed, and actual contamination will be cleaned up in accordance with industry guidelines.
G4	Incident management procedures for spills and leak management will be developed in accordance with the • NSW Department of Environment and Climate Change, Storing and Handling Liquids: Environmental protection guide to managing environmental risks associated with the storage and handling of liquid substances; and • Victoria's EPA guidelines section, Bunding and Spill Management.

No.	Commitment
G5	Preventative controls for spills will be implemented, including: • bunding and containment • alarm systems • regular training and routine inspection of potential contamination sources.
Land management, soil management, erosion and sediment control	
LM1	Soil management strategies will be applied, including the development of soil management practices in accordance with the Australian Standard AS 1289 Methods of testing soils for engineering purposes (as required by Capelin 2008) and Landcom (2004) for managing urban stormwater–soils and construction.
LM2	A detailed Erosion and Sediment Control Plan will be developed in accordance with the • Best Practice Erosion and Sediment Control Guideline (IECA 2008), • Australian Standards AS 1289 Methods of testing soils for engineering purposes (as required by Capelin 2008) and Landcom (2004) for managing urban stormwater–soils and construction, and • Managing Urban Stormwater Soils and Construction Volume 2E (DECC 2008), including the consideration of soil binders, revegetation (reseeding), light mulching, heavy mulching and rock mulching. Where appropriate, the Erosion and Sediment Control Plan for the Project will include the following criteria: • Limit land clearing to the minimum amount of land required for the safe operation of the Project. • When possible, carry out rehabilitation as mining operations are completed and land becomes available. • Place soil stockpiles away from drainage areas, roads, machinery, transport corridors, stock grazing areas and areas where they may be susceptible to wind erosion. • Divert overland flow/runoff around disturbed areas. • Identify activities that could cause erosion and generate sediment. • Identify location, function and capacity of erosion and sediment control structures to minimise soil erosion and the potential for transport of sediment downstream. • Manage impacts of construction on identified areas (such as existing erosion, erodible soil types, saline soils or acid sulphate risk). • Ensure erosion and sediment control structures are appropriately maintained. • Deposit soil material directly on to areas to be rehabilitated to facilitate revegetation and maximise the use of the available seed bank. • Seed soil material as soon as possible after depositing on to rehabilitated areas if required.
LM3	Topsoil stripping will be timed, when practicable, to avoid periods of excessive rain or prolonged dry periods.
LM4	Stockpile management measures will be developed that are site-specific for the Project; specifically: • Stockpiles will be managed, taking in account locations, separation of waste types, sediment controls and stabilisation. • Stockpiles will be stabilised, establishing appropriate sediment controls and suppressing dust as required. • Stockpiles will be located away from drainage lines, waterways and areas where they may be susceptible to wind erosion.
LM5	When possible, the soil material should be stripped with its existing ground cover vegetation.
LM6	Topsoil stockpiles generally will be less than 3 m high and positioned in a manner to encourage controlled water drainage and discourage erosion.
LM7	Suitable stockpile material will be delineated and separated, such as the separation of soil types (i.e. topsoil and subsoil stockpiles).

No.	Commitment
LM8	Measures for controlling sediment and soil erosion in stockpiles will include the following where appropriate: • Suitable non-erosive drainage conditions will be established during stockpile construction (e.g. diversion of up-slope stormwater runoff); • A vegetation and/or mulch cover (e.g. hydro-mulching, rock mulching) will be laid on established stockpiles; • Erosion control blankets, mats and mesh (e.g. geofabric, jute matting, coir blanket) may be used where necessary; and • Chemical stabilisers, such as soil binders (e.g. lime, polymer soil stabilisation solutions), may be used where necessary.
LM9	Testing of soil properties prior to use in rehabilitation will be carried out. Key parameters that may be tested include: • pH; • exchangeable sodium percentage; • cation exchange capacity (major cations); • organic matter content; and • other essential nutrients, such as nitrate, phosphorus and sulphate (sulphur).
LM10	Based on soil testing results, soil ameliorants will be applied to assist rehabilitation outcomes. Ameliorants will be based on advice from a qualified agronomist/soil scientist.
LM11	Stockpiles will be monitored for erosion and weeds, with control measures implemented as appropriate.
LM12	To enhance revegetation success for rehabilitation, appropriate soil types will be laid (e.g. subsoils will be placed underneath topsoils).
LM13	Fertilisers, soil ameliorants and an appropriate seed mix may be applied to increase the likelihood of rehabilitation success.
LM14	Where possible, a minimum thickness of 0.2 m topsoil will be laid to encourage a growth medium of sufficient depth to hold water and support vegetation.
LM15	As mining operations cease, progressive rehabilitation will be completed as soon as land becomes available to reduce the risk of erosion.
LM16	Sediment control structures will be used to minimise the release of water with elevated suspended sediments into the receiving environment.
LM17	The Tritton Copper Operations Land Management Plan will be updated to incorporate topsoil recommendations (including stripping and stockpiling).
Maintaining vegetation cover for PMLU	
LM18	To achieve 60% cover and the stabilising soil for intended post-mining land use, soil binders (chemical surface stabilisers, such as gypsum) may be applied for short-term soil stabilisation to support vegetation establishment.
LM19	Re-seeding will be undertaken to establish a temporary or permanent vegetation cover over exposed soil surfaces.
LM20	To control raindrop impact erosion on slopes and assist in seed germination, light mulching may be applied using a protective blanket of straw or other plant residues.
LM21	Where appropriate, rock mulching will be installed as a thick blanket of rocks, aggregate or gravel on the soil surface in areas of high risk of erosion, such as drainage lines or non-vegetated banks.
Visual amenity	
VA1	Neutral tones will be used for the Project building exteriors to reduce potential contrast with the surrounding visual landscape.

No.	Commitment
VA2	The proposed new section of haul road will be constructed to the north-west of Girilambone to avoid the haulage through the township.
VA3	Lighting will be placed, configured and directed to reduce light emissions during the operational phase of the Project as per Australian Standard AS 4282 – Control of Obtrusive Effects of Outdoor Lighting.
VA4	Rehabilitation of mining disturbance and landforms will begin as soon as land becomes available to lessen visual impacts on sensitive receptors.
VA5	Additional visual screening will be created along roadsides and property boundaries of sensitive receptor R1 by planting semi-mature trees to act as visual barriers.
VA6	The waste rock emplacement (WRE) will be designed to have a final landform that does not significantly contrast with the existing topography.
Water and surface water management	
W1	Site water management storages will be dewatered to the pit sump prior to forecast rainfall events.
W2	A baseline and operational water quality monitoring program will be implemented. The program will be event-based and compliant with the relevant water monitoring plan for the Project, specifically: • Transfers to and from the Project will be via the off-site water supply pipeline. • Transfers in and out of the open cut pit and underground mine will be compliant with groundwater licensing. • Internal site transfers and individual storage inventory will be monitored for an annual review of the site water balance. • Surface water quality will be monitored quarterly at the monitoring locations and parameters identified in the Water Impact Assessment. When proposed monitoring locations are inaccessible due to landholder access agreements, suitable alternative monitoring locations will be investigated. Baseline surface water quality data will be used to derive site-specific trigger values. Construction and operational surface water quality monitoring will be conducted on a discharge event basis.
W3	Treated effluent disposal will be monitored in accordance with the: • Managing Urban Stormwater: Treatment techniques guideline (EPA 2004), and • Australian Guidelines for Sewerage Systems: Effluent Management ARMCANZ (1997).
W4	A Water Management Plan will be prepared that includes site-specific requirements for the Project to demonstrate compliance with water related, regulatory requirements.
W5	The water balance model will be run annually with recent site data and revised every three years. The average predicted water balance for the Project will be included in the Water Management Plan and the results for each year will be reported in the annual review for the Project.
Groundwater	
W6	Tailings transported to site from the Tritton Copper Mine will be processed into a paste on a lined pad as soon as practicable and emplaced underground to minimise oxidation.

No.	Commitment
W7	The existing groundwater monitoring network will continue to be monitored during mining operations including: • annual review of the monitoring program, including assessing whether additional monitoring bores are required; • installing meters to transfer water into and out of the mine workings during operations to allow modelled and actual inflow to be compared; • quarterly monitoring of groundwater levels at the existing monitoring bore network; • quarterly monitoring of groundwater quality for the parameters used for the baseline monitoring program (with the exception of total suspended solids and turbidity) at the existing monitoring bore network.
W8	Climate will be monitored by an automated on-site weather station to support site water management and implement the site water balance.
W9	The predictions of the groundwater model will be reviewed after two years of mining. The groundwater model review will include a comparison between the modelling results and groundwater monitoring data and mine dewatering volumes. Data collected during monitoring programs may be incorporated to improve the model, and if required, the model will be revised to improve the fit between observed and modelled dewatering volumes and groundwater levels.
Biodiversity	
B1	Preclearance protocols will be put in place during vegetation clearing. Preclearance surveys will confirm the absence of any nesting fauna in trees to be removed. The clearing protocols will include soft-felling techniques and clearing supervision when habitat trees (where nests or other habitat features are identified) are to be removed. Soft-felling techniques will typically include: • marking of all habitat trees to be cleared and demarcate the clearing boundary to avoid removing or impacting trees to be retained; • removal of ground-layer and mid-storey vegetation (under-scrubbing) around habitat trees; • tapping/nudging habitat trees by heavy machinery prior to their removal; • soft felling controlled by machinery to keep hollows intact and limit potential impacts to nesting fauna; soft felling involves the use of machinery (blade, claw or bucket) positioned at the base of the tree trunk over the structural roots; the position of the machinery on the roots controls the slow drop of the tree; and • inspection of lowered habitat trees and capture and release of any fauna species present; injured wildlife will be taken to an appropriately qualified wildlife carer or the nearest veterinary clinic. Clearing of habitat trees by bulldozing with or without linked chains will not be permitted to prevent increased likelihood of injury or death to fauna;
B2	The Tritton Copper Operations Weed Management Plan will be updated to include management of the Project area and implemented during all Project phases. The performance outcomes of the Weed Management Plan will include: • all existing weed locations to be controlled; • no new noxious weed infestations established; and • rehabilitation areas free of noxious weeds.
B3	When clearing within the Aeris block results in removal of hollow bearing trees with potential as Pink Cockatoo habitat trees or known/confirmed Corben's Long-eared Bat roost trees, the hollow bearing tree will be reused and/or replaced. Salvage and reuse options for hollow bearing trees will be assessed based on the characteristics of trees cleared for the Project. When suitable, hollow bearing trees can be cut and capped, then erected as tree hollows or ground habitat. Nest boxes could also compensate for the hollow bearing trees removed. A minimum replacement strategy of 1:1 for every hollow removed will be targeted and should include at least thirty hollows or nest boxes suitable for Pink Cockatoo. Hollows that are confirmed to meet dimensions of hollows known to be used by Pink Cockatoo or are occupied by Corben's Long-eared Bat should be salvaged where possible

No.	Commitment
B4	A Construction Environmental Management Plan will be prepared prior to clearing native vegetation. The plan will include the following: • identification of necessary hold points to ensure all biodiversity management actions are met (i.e. pre-clearing surveys followed by stage clearing of vegetation); • clearing of hollow bearing trees to be supervised by a suitably qualified ecologist following the removal of non-habitat vegetation; • a stop work order if a Pink Cockatoo is identified in a hollow bearing tree during clearance works.
B5	A Flora and Fauna Management Plan will be prepared and approved prior to clearing native vegetation and threatened species habitat within the development site. The plan will include provision for the maintenance of habitat for native species, in particular the Pink Cockatoo. Habitat maintenance will include assurance that clearing is restricted to approved disturbance areas; specifically: • provision for the maintenance of habitat for native species, in particular the Pink Cockatoo; • identification of hold points for clearing stages; • maps to identify construction limits and environmentally sensitive areas; • measures to avoid and minimise indirect impacts to biodiversity values adjacent to the Project site; and • updates required for the site induction procedure. The Flora and Fauna Management Plan will include provision for dealing with injured fauna. When injured animals are identified, the relevant local wildlife rescue agency (e.g. WIRES) and/or veterinary surgery will be contacted as soon as practical and immediate care will be provided to the animal.
B6	Aeris will update the Tritton Copper Operations Bushfire Management Plan to include the Project areas, including the Aeris block where the new road is proposed and the locations of the majority of impacts on conservation significant species. The plan will provide for the management and control of fire hazards by: • monitoring and maintaining areas for bushfire hazards; • identifying the response to control outbreaks of fires; • protecting the biodiversity habitat within the Aeris block from fire damage.
B7	Impacts to biodiversity values will be offset under NSW regulation.
Air quality and dust management	
AQ1	During adverse weather conditions, the Project activities' impacts on air quality will be assessed and modified as required (e.g. activity will cease when reasonable levels of dust cannot be maintained using the available means).
AQ2	Weather forecasts will be checked prior to undertaking any material handling or processing that poses a high risk of generating dust.
AQ3	On-site vehicles and plant engines will be switched off when not in use for extended periods.
AQ4	Vehicles will be maintained and serviced to minimise emissions.
AQ5	Vehicles and plant will be fitted with pollution reduction devices, such as diesel particulate filters when practicable to limit the generation of particulates.
AQ6	Activities will be visually monitored to identify potential sources of dust generation.
AQ7	The extent of exposed surfaces and stockpiles will be kept to a minimum to limit the generation of particulates.
AQ8	Exposed areas and stockpiles will be watered or covered to reduce dust emissions when practicable.
AQ9	Rehabilitation earthworks will be undertaken when practicable (i.e. when topsoil and subsoil stockpiles are moist and/or wind speed is below 10 m/s to minimise dust generation).
AQ10	Drop heights will be reduced from loading and handling equipment when practicable to lower dust generation.

No.	Commitment
AQ11	During handling, material will be dampened when excessive dust is likely to be generated.
AQ12	Unsealed haul roads, including the haul route from the Project site to the Mitchell Highway, will be watered using water carts. Roads are to be sufficiently moist to minimise on-road dust generation but not cause track washout.
AQ13	Haul roads will be inspected on a regular basis to ensure they remain in good operational condition.
AQ14	Driveways and hardstand areas will be swept or cleaned to minimise particulate generation.
AQ15	Vehicle traffic will be restricted to designated routes and speed limits will be enforced.
AQ16	Vehicle loads will be covered when travelling off-site.
AQ17	A site Air Quality Management Plan will be developed with procedures that require dust levels to remain below the relevant criteria for incremental and cumulative dust metrics at sensitive receptor locations.
Greenhouse gas management	
GG1	Energy efficiency will be considered as a criterion when selecting mining tools, heavy mining equipment, diesel and electric-powered motors and other equipment for purchase.
GG2	Options will be identified for multi-functional mining tools and heavy mining equipment for day-to-day operations that can be used to lower fuel consumption.
GG3	Energy-efficient lighting and controls will be installed where practicable.
GG4	Mine planning management measures will include minimising the vegetation clearing.
GG5	Progressive rehabilitation will be undertaken to rehabilitate the land as soon as practicable.
GG6	Fuel products that promote and deliver efficiency in consumption (i.e. premium fuels, additives etc.) will be used when practicable for mining and associated processes.
GG7	Production monitoring systems will be utilised to minimise fuel consumption and reduce idle time.
GG8	Heavy mining equipment will be maintained and used to design criteria and maximise efficiency.
GG9	Electrical equipment will be maintained to retain energy efficiency.
GG10	Haul roads will be constructed and maintained to minimise rolling resistance.
GG11	Blasting design practices and technology will ensure blasting energies are optimised and can be best utilised for material movement.
GG12	Rainwater capture and reuse, along with recycling and reuse of mine-affected water for mining operations, will minimise water requirements.
GG13	Recycled water will be utilised for processing operations to reduce off-site pumping requirements.
GG14	Operator training will be provided on techniques to minimising fuel or energy consumption. This will include minimising unnecessary idle time and dumping techniques.
GG15	Effective stock holding, management and logistic processes for ‘critical insurance’ stock, freight consolidation and minimising ad hoc freight transport will be undertaken to reduce energy consumption.
GG16	When suitable, local personnel will be engaged to operate the mine to reduce fuel consumption associated with extended worker commutes.
GG17	Current and future technologies will be reviewed to improve efficiencies and reduce greenhouse gas contributions from heavy mining equipment and ancillary equipment.

No.	Commitment
GG18	Solar energy and other clean energy sources will be used to extend battery life at workshops, diesel lighting plants and remote monitoring and control stations.
GG19	Internal energy audits and annual reporting of energy mass balances will be reviewed to identify where greenhouse gas emissions can be reduced.
Noise and vibration	
NV1	A construction environment management plan will be developed
NV2	A complaint handling procedure for construction activities will be implemented that includes the following: • A dedicated phone line • A central point of contact • A register of complains • Reporting procedures
NV3	Constructions activities proposed to occur 24 hrs a day, seven days a week for the haul road, will be restricted to zones which are located more than 2 km away from any sensitive receptor (Zone 1 and Zone 2).
NV4	Graduated mitigation measures for construction noise impacts to sensitive receptors include 5dB(A) above the noise management level: • Notification as letterbox drop or equivalent >5 to 15dB(A) above the noise management level (additional to the above): • Verification of noise levels • Duration Reduction. >15 to 25dB(A) above the noise management level (additional to the above): • Phone Calls. • Specific Notification letterbox dropped . • Individual Briefings by project representatives. >25dB(A) above the noise management level (additional to the above): • Individual Meetings.
NV5	Engines will be switched off when not in use for extended periods.
NV6	Broadband reversing and low nuisance start-up alarms will be used on mobile equipment to maintain low noise levels.
NV7	Assessments will be performed on significant noise-generating mobile equipment to investigate attenuation options.
NV8	Operational activities will be modified during periods of meteorological enhancement. Potential worst-case (noise-enhancing) meteorological conditions will be assessed and, where practicable, operational activities will be modified to minimise noise; for example, during significant wind events.
NV9	Noise complaints and incidents will be logged and investigated, including any corrective actions.
NV10	Prior to the undertaking of an activity that may generate higher than usual noise output, consultation with those who will be potentially affected will be undertaken.
NV11	Surface blasting will be limited to daylight hours.
NV12	Relevant safety protocols (such as establishing exclusion zones) will be determined prior to blasting.
NV13	Meteorological conditions will be considered within the blast design process as a mechanism to prevent exacerbation of impacts.

No.	Commitment
NV14	A process to ensure adequate notification of upcoming blasts to relevant receptors will be established and adopted.
NV15	A complaints register will be maintained to record any blasting or vibration related complaints.
Non-mineralised and general waste management	
WM1	Waste management for the Project and any site-specific plans will be aligned to the waste hierarchy and objectives of the NSW *Waste Avoidance and Resource Recovery Act 2001*. Management strategies will be adopted that apply the hierarchy to avoid, reduce, reuse, recycle, recover, treat or dispose of waste.
WM2	General solid waste will be stored in covered bins or skips within lunchrooms, offices, outside workshops and elsewhere as required. Bins will be placed in open areas will be fitted with animal-proof lids.
WM3	Scrap metal will be stored in a specified area (or elsewhere as required) and be collected on a regular basis by a scrap metal recycler.
WM4	Pallets will be stored and reused on-site as appropriate.
WM5	Vegetation from clearing will be stockpiled or mulched on-site to be reused for progressive rehabilitation.
WM6	For waste disposal, general solid waste and pallets will be collected by licensed contractors and transported to an appropriately licensed facility for disposal.
WM7	Waste oils and greases will be stored in IBC's and 205 L waste drums placed in bunded hydrocarbon waste storage areas.
WM8	Oily rags and filters will be segregated and stored on-site in bunded areas.
WM9	Batteries will be placed in a covered and labelled battery storage area until removed from the site by licensed contractors.
WM10	Waste oils, greases, oily rags and filters will be collected for disposal, and batteries will be collected by a licensed contractor and transported to an appropriately licensed facility.
WM11	Tyres will be placed in a demarcated used tyre storage area until removed from the mine site or used for another purpose.
WM12	Tyres will be transported to a licensed waste management facility for disposal or removed by a third party holding an approved recycling permit.
WM13	Wastewater will be treated in the on-site sewage treatment plant.
WM14	A sewage treatment plant of appropriate scale to cater for the size of the peak workforce will be established on the Project site to treat effluent. The treated effluent will be used for sub-surface irrigation.
WM15	Sewage sludge will be removed by a licensed waste contractor as needed, with treated effluent sub-surface irrigated in accordance with the Bogan Shire Council requirements and approval.
WM16	The Tritton Copper Operations Waste Management Plan will be reviewed biennially and revised when necessary to meet the specific situation of this Project.
WM17	All inspection records will be kept, and appropriate management actions will be taken when required.
WM18	The waste management strategies from the existing Tritton Waste Management Plan and will be adopted and reviewed biennially and revised, when necessary, to meet the specific Project situation.
WM19	Non-mineral non-hazardous waste will be categorised into recyclable and non-recyclable waste.
WM20	Recyclables will be transported off site by a licensed contractor for recycling.

No.	Commitment
Mineralised waste	
MW1	During the operational phase, geochemical sampling and analysis will be completed for representative samples from exploration, resource drilling and drill and blast holes in any areas (such as the proposed decline and final pit wall when additional information is required to verify acid and metalliferous drainage (AMD) potential).
MW2	The geochemical data from this waste rock will be added to the resource/mine waste block model to increase the understanding of the mine waste breakdown for each mine waste class.
MW3	Development waste and mine waste from the open pit and underground deposit will be analysed and classified before this material is placed into the WRE.
MW4	The WRE will be designed to enable all potentially acid forming (PAF) waste to be emplaced in PAF cells within the WRE to minimise the potential for sulphide bearing mine waste to be exposed to oxygen and water. This will minimise long-term AMD issues to the extent possible.
MW5	Surface water, groundwater and process water sources will be monitored over the mine life to track changes in water chemistry. If changes occur this will trigger additional monitoring to verify the cause of the AMD so mitigation measures can be implemented.
MW6	At mine closure, any seepage from the heap leach pad (HLP) and the WRE will be directed to the final void, unless the surface water testing indicates the water is suitable for release into the receiving environment.
Hazards and safety	
HS1	To manage the fire/explosion related risks, site access will be restricted to trained and authorised site staff and operators.
HS2	Regular inspections will be conducted to identify and manage hazards.
HS3	Bushfire risk controls will be developed and implemented, including the construction of fire breaks and/or undertaking hazard reduction burns.
HS4	Access to critical infrastructure and emergency response equipment will be included in the Project design.
HS5	Early fire detection and water sprinkler systems for critical areas will be installed.
HS6	A Bushfire Management Plan for the Project will be prepared and implemented for preventing fire during construction and operational activities.
HS7	Ongoing and timely maintenance of all mobile and fixed plant equipment will be undertaken in accordance with the recommended maintenance schedule and be consistent with maintenance schemes required by relevant legislation.
HS8	Equipment operators and drivers will be trained and licensed, as appropriate, for their operations. Only personnel who are appropriately licensed and authorised will undertake work when such licensing is required.
HS9	Mining and civil-engineered structures will be constructed in accordance with the applicable Australian Standards, codes and guidelines. When applicable, Aeris will obtain the necessary licence and permits to design and construct engineered structures.
HS10	All contractors employed on-site will be operating in accordance with the relevant Australian Standards and NSW Legislation.
HS11	Water management structures will be constructed to separate clean and mine-affected water. Runoff from disturbed areas will be captured in the site's water management system, while runoff from undisturbed areas will be directed around the mine site.
HS12	Fire hazards will be removed from run-of-mine ore management areas. Firefighting and dust suppression equipment will be maintained in appropriate locations. Regular inspections will be conducted.

No.	Commitment
HS13	Storage facilities will be developed, and procedures will be implemented for using any potentially hazardous materials (e.g. hydrocarbons, sulphuric acid, raffinate). The procedures will comply with Australian Standards and requirements of relevant legislation.
HS14	A dangerous goods register will be developed and kept up to date with chemicals and dangerous goods stored on-site.
HS15	Emergency response procedures will be documented, and procedures and systems will be implemented.
HS16	The safety management system will incorporate Environmental Management Plans designed to minimise and mitigate environmental impacts. The existing Aeris Environmental Management Plans will be updated to address the Project, or new plans will be developed.
Heritage historical	
HH1	All ground-disturbing activity will be confined within the area of the proposed works. Additional assessment may be required if the Project layout change and area outside the assessed study area are to be impacted.
HH2	If unexpected non-Aboriginal heritage, including archaeological relics, are discovered during proposed works, all work in the immediate area will cease. In accordance with s146 of the Heritage Act, a qualified archaeologist and, if necessary, Heritage NSW, will be contacted to assess the significance and advise on further requirements prior to the recommencement of works.
Cultural heritage	
CH1	An Aboriginal Cultural Heritage Management Plan will be developed after consulting with the registered Aboriginal parties (RAPs), relevant regulatory authorities and the Aboriginal community as per the guidelines. The Plan will be regularly reviewed, and copies of the final report will be made available to each RAP, the Department of Planning and Environment and Heritage NSW. It will include: • consultation with RAPs to develop the Aboriginal Cultural Heritage Management Plan; • inductions conducted to communicate and inform site staff regarding obligations of the Aboriginal Heritage Management Plan for Project staff; and • an implemented action plan for the discovery of previously unknown Aboriginal cultural heritage objects.
CH2	Aeris will avoid impacts to 38 Aboriginal Cultural Heritage sites as identified in the Aboriginal and Cultural Heritage Assessment Report (Appendix 3).
CH3	'No go zones' with a minimum 5-metre buffer will be established on the construction site.
CH4	Scar trees must be identified as "no go zones" on all construction and management plans (e.g. Okeh 8 Scar Tree located approximately 35 m south of the amended alignment)
CH5	Management plans will be implemented for identified Aboriginal Cultural Heritage sites out of the Project impact area.
CH6	Temporary high-visibility fencing will be installed to demarcate sites Okeh 1 and Okeh 6 and avoid disturbance.
CH7	Salvage surface collection and storage in consultation with RAPs, as identified in the Aboriginal and Cultural Heritage Assessment Report (Appendix 3), will be undertaken. • A salvage of Okeh Scar Tree 9 should be undertaken to mitigate harm in accordance with an AHMP
CH8	Provision should be made to return Aboriginal objects to RAPs entitled to, and willing to accept possession, custody or control of the Aboriginal object in accordance with Aboriginal tradition
CH9	Traditional flora at location 5 and 6 will be relocated in consultation with RAPs to an undisturbed area.

No.	Commitment
CH10	Subsurface testing will be undertaken in areas of potential archaeological deposits identified to be impacted.
CH11	Additional archaeological surveys will be undertaken if the parameters of the proposed works extend beyond the area assessed.
Social	
S1	To limit the traffic volumes, materials and equipment deliveries will be coordinated to minimise vehicle movements on access roads.
S2	Traffic control measures and signage for safe movement of vehicles will be installed permanently or temporarily.
S3	Stakeholders will be notified of any material Project traffic-related activities (such as road closures due to road works) as soon as practicable and prior to the activities.
S4	A road maintenance program will be implemented to ensure the haul road is kept in a trafficable condition.
S5	The haul road will be sealed where possible to mitigate noise and dust from vehicles. Watering of sections of unsealed road will be carried out to minimise dust impacts.
S6	To minimise safety risks, speed limits will be reviewed for the haul road, particularly around sensitive users.
S7	Aeris will work with affected landowners to address concerns in relation to property impacts.
S8	Impacts resulting from acquiring freehold land and increased truck movements to rural and agricultural lifestyle will be negated by consulting with landowners and addressing their concerns related to property impacts (e.g. fencing requirements, livestock safety) through property specific agreements.
S9	A landowner compensation mechanism will be implemented through existing legal frameworks to address impacts on rural residents.
S10	A workforce accommodation strategy will be developed to address the increased housing demand of construction workforce.
S11	Bogan Shire Council will be consulted to identify and respond to housing and workforce impacts.
S12	Construction operators will contact the accommodation operators before commencing construction to plan for maximum capacity and schedule bookings.
S13	Council and real estate agents will be advised of workforce ramp-up.
S14	Residency in the local area will be continuously promoted through the provision of a residential allowance and subsidised housing for certain personnel.
S15	Community engagement and liaison will be undertaken to provide information on potential impacts resultant of Project activities.
S16	To mitigate impacts of the increased temporary construction workforce (FIFO/ DIDO) on community safety, Aeris will establish a Workforce Conduct Policy that sets clear workforce behaviour expectations.
S17	Social capital and resilience will be enhanced by: • identifying local projects; • encouraging settlements in towns; • developing settlement campaigns and initiatives for sponsorships and donations to support community cohesion; • promoting local values, environmental projects, family-oriented initiatives and health-related initiatives.

No.	Commitment
S18	Aeris will work with the community and the Girilambone Community Association to explore opportunities to partner/assist with tourism initiatives—for example, a signage project; community arts project; the restored railway station and carriages and camping in the park opposite the pub.
S19	Aeris will work with the Girilambone Community Association and other groups to identify local community development projects and initiatives for sponsorship and in-kind donations.
S20	To inform, consult, involve and collaborate, Aeris will hold regular community meetings with representatives of the Girilambone Community Association.
S21	To best manage the increased demand for health services, Aeris will reduce additional demands on local health services by providing on-site first aid facilities for workers to address minor health issues.
S22	First response services will be provided on-site during emergency situations and site accidents.
S23	Aeris will continue to use the Aeris-supported online support system for workforce injuries at the Project.
S24	To reduce traffic accidents owing to heavy haulage and an increased commuting workforce, regular communication with emergency services will be maintained, and the local emergency management meeting will be attended.
S25	To manage the anti-social behaviour of non-resident workers, Aeris will engage with the Police to develop an emergency response plan and relationships to proactively ensure Project-related community safety.
S26	Meet and greet days with local emergency services will be continued.
S27	A complaints system will be implemented to identify, track and remediate (when possible) community complaints associated with traffic activities from the Project's construction and operation phases.
S28	Aeris is committing to improving the mental health of the workforce and residents by preparing a workforce health and wellbeing strategy to manage mental stress issues.
S29	A health and safety management system will be implemented to manage fatigue and risks associated with drugs and alcohol and workforce hygiene.
S30	The employee assistance program will be available to provide staff and immediate families with free and confidential support services.
S31	Prior to the mine closure, Aeris will engage with the workforce to prepare a people and community strategy and engage the workforce in mine closure planning. When possible, workers will be deployed to other Aeris-operated projects following closure of the Constellation mine.
S32	Career progression pathways will be provided to the workforce through provision of an upskilling and employment development program.
S33	Traditional owners will be consulted to determine opportunities for salvaging and/or recording heritage sites prior to impact.
S34	Identified sites from the Project studies will be registered on relevant NSW databases to support improved understanding and protection.
S35	In consultation with affected landholders, when practicable, screening along the haul road will be installed to minimise the visual amenity impacts.
S36	Water access licences will meet water sharing requirements of regional water sharing plans.
S37	A Workforce Recruitment and Management Strategy will be developed to provide employment certainty, and maximise local, disability and Indigenous employment.
S38	Training, apprenticeship, cadetship and/or intern programs will be offered to Nyngan High School that can provide pathways for local students.

No.	Commitment
S39	Aeris will promote available employment opportunities via online job boards, local newspapers and other avenues.
S40	To promote employment and training opportunities for Ngemba, Ngiyampaa, Wanagaaypuwan and Wayilwan people, Aeris will work with Nyngan Local Aboriginal Land Council to explore opportunities and encourage contractors and suppliers to provide training and recruitment opportunities.
S41	Aeris will engage with Nyngan Local Aboriginal Land Council to identify opportunities for Aboriginal-owned businesses to work with Tritton Resources and its contractors.
S42	Positive community cohesion and development will be facilitated by providing opportunities for interactions between Constellation employees and local residents.
S43	An annual resident community information session will be conducted prior to any construction, and they will continue for at least the first two years of the Project's commencement, with the purpose of providing a Project update and addressing any potential issues or concerns.
S44	Stakeholders will be provided direct access to Project representatives to seek answers to their questions about the Project and its potential impacts.
S45	Through the Community Consultative Committee, relationships will be built to support communication, information sharing and feedback to assist decision making relating to construction and operational impacts.
S46	Aeris will ensure community aspects of the Constellation Project are part of the agenda for ongoing Community Consultation Community forum meetings.
Economics	
E1	Consistent with existing policies implemented for the Tritton Copper Operations, contractors will be encouraged to source local labour when possible. Training opportunities will be provided to the locally engaged labour personnel when practical to maximise local benefits derived from the Project.
E2	Aeris has a longstanding relationship with local businesses and is an established supply chain for its existing activities in the local catchment, regional catchment and NSW. To maximise their localised benefits, Aeris will continue to support local businesses by utilising their established supply networks and providing sufficient opportunities and information for local businesses to secure new supply contracts.
E3	Aeris will seek to mitigate additional demand for accommodation in the local catchment to minimise the impact on housing availability and affordability by monitoring the accommodation market during construction and operational phases.
E4	Existing mitigation measures and strategies for the Tritton Copper Operations, as well as progressive rehabilitation of the site, will be continued to ensure long-term impacts on agriculture are minimised.
Transport	
T1	A Traffic Management Plan will be prepared to address heavy vehicle traffic and vehicle types operating outside the mining leases during the life of the Project (construction, maintenance, operation and decommissioning).
T2	To minimising the traffic safety impacts of the development and disruptions to local road users during the construction and decommissioning of the development, Aeris will install temporary traffic controls, including detours and signage
T3	During the construction and decommissioning phase, the local community will be notified about development-related traffic impacts.
T4	Potential conflicts will be minimised between development-related traffic and: • stock movements; • domestic animals; and • school buses in consultation with local schools.

No.	Commitment
T5	Measures will be implemented to minimise development-related traffic on the public road network out of standard construction hours.
T6	Procedures and systems will be implemented to ensure that development-related traffic does not track dirt onto the public road network.
T7	Loaded vehicles entering or leaving the site will have their loads covered or contained.
T8	Sufficient parking will be provided on-site for all development-related traffic.
T9	Any emergency road repair requirements and maintenance will be responded to as soon as practicable during construction, operations and decommissioning.
T10	A traffic management system will be implemented for managing over-dimensional vehicles.
T11	Fatigue Management Plans will be prepared.
T12	A driver's code of conduct will be implemented, addressing: • travelling speeds; • procedures to ensure that drivers to and from the development adhere to the designated over-dimensional and heavy vehicle routes; and • procedures to ensure that drivers implement safe driving practices when driving to and leaving the Project-related activities.
Rehabilitation	
R1	Rehabilitation of the Project mine site will be undertaken to create a safe, stable and non-polluting post-mining landform with agreed post-mining land uses.
R2	Progressive rehabilitation of mining landforms will be undertaken during the operational phase of the Project when practical.
R3	All infrastructure that is not to be used as part of the final land use will be removed.
R4	A Rehabilitation Management Plan, rehabilitation objectives and a forward program will be prepared to conform to the requirements of the *NSW Mining Act 1992* and relevant guidelines and polices, including Form and Way – Rehabilitation Management Plan for Large Mines (NSW Resource Regulator 2021b). Interim completion criteria will be further refined during preparation of the Rehabilitation Management Plan.
R5	Rehabilitation monitoring will be undertaken using analogue sites and landscape function analysis to assess rehabilitation progress and success in accordance with the rehabilitation strategy.
R6	The vegetation used for rehabilitation will include one or more species within the surrounding plant community types (i.e. PCT 180 and PCT 176).
R7	Frequent inspections of rehabilitation areas, nominally on a quarterly basis, will be undertaken to allow for early identification and correction of issues affecting the success of rehabilitation works. An inspection schedule will be developed and implemented. Corrective actions will be implemented following the identification of any required measures.
R8	Landform evolution modelling will be completed on final landform designs to verify acceptable erosion rates prior to commencing final landform construction.
R9	Underground stopes will be backfilled in accordance with the methodologies recommended in Appendix 1, Geotechnical assessment, Section 9.7.1.
R10	A final geotechnical assessment of long-term slope stability at the completion of open cut mining will confirm the location of an effective safety barrier to restrict access to areas of long-term instability around the pit (void). The safety barrier (bund) will be constructed with regolith/non-acid forming (NAF) rock to be retained around the pit shell (void) and/or a safety fence (and signs) installed to prevent unauthorised access.

No.	Commitment
R11	The WRE and HLP final landforms will be designed in accordance with good construction practices for water management, including: • limiting water ponding; • avoiding the creation of perched water tables; and • surface water management with reverse-graded berms, drains and drop structures.
R12	Rehabilitation of the WRE will occur progressively throughout the operational phase of the Project. During its construction, the WRE will be built to the final profile, including the progressive encapsulation of PAF material. As batters are completed, they will be shaped, covered with topsoil and seeded in accordance with the rehabilitation strategy: • A 5 m layer of NAF material will be placed at the base of the WRE before placing PAF-HC and PAF material. • The PAF cells will be covered with a 0.5 m thick low permeability seal and trafficked. • The PAF waste will be covered with a minimum of 3 m of NAF mine waste to be placed vertically above the encapsulated PAF cell. • Outer surfaces, including the top tier of the WRE, will have a 2 m store and release soil cover system (achieving a total cover of > 5m).
R13	A rehabilitation materials balance and projection will be established and maintained over the life of the operations to ensure sufficient materials are available for rehabilitation. The materials balance will include topsoil, subsoil and regolith/NAF waste rock.
R14	Waste material will be handled according to its classification: • Operational procedures will be developed to assess and identify waste materials as either NAF or PAF. • Operational procedures will be developed to ensure PAF and NAF materials are segregated and selectively handled to ensure there is no cross contamination or misplacement of materials.
R15	Competent NAF rock will be retained in a separate stockpile for rehabilitation and ancillary purposes and not placed within the WRE.
R16	A final surface water design for the WRE will be undertaken to ensure berms, drains and drop structures are appropriately sized and constructed.
R17	The clean water diversions, process runoff dam, waste dump catch dam and the mine infrastructure area runoff dam may be retained in the post-closure landscape. Dams will be assessed by a civil engineer to ensure their suitability for final land uses.
R18	The HLP will be covered with a store and release cover system comprising NAF material of suitable thickness (~ 0.9 m) and 0.1 m topsoil to minimise seepage.
R19	A post-closure Surface Water Management Plan will be developed that defines water containment and flow paths (and controls) for the final land uses.
R20	At the completion of underground mining, an engineered concrete plug will be constructed in the portal, and the box cut filled with NAF, subsoil and topsoil. The engineered plug will be designed, inspected and signed off by a qualified and experienced engineer.
R21	At the completion of underground mining, any surface ventilation infrastructure will be removed, and an engineered concrete cap will be constructed over the ventilation shafts.
R22	Seepage waters from the HLP, WRE and mineralised waste stockpile will be contained in the open pit void. Formal drains will be designed and established to passively direct seepage waters to the void.
R23	Regular inspections of the heap leach facility will be conducted, including regular monitoring of piezometers installed to monitor the performance the HLP underliner.
Geotechnical mitigations	
GT1	Active monitoring will be undertaken of pit walls using applicable industry methods, with a minimum of prism monitoring. Should significant instability develop, additional slope stability monitoring methods will be considered.

No.	Commitment
GT2	Geotechnical mapping of open cut pit structures will be conducted to identify possible instability mechanisms.
GT3	Pit slope performance will be reviewed during mining to confirm the appropriateness of the design and identify any potential instabilities.
GT4	The long-term groundwater level immediately behind the pit slope will be monitored using applicable industry methods. Horizontal drain holes may be required if pore pressures build up to unacceptable levels, particularly around major structures.
GT5	Measures will be taken to control rock open cut pit fall risks, including appropriate blasting methods, thorough scaling of walls post-blasting and cleaning berms to maximise catch capacity.
GT6	Internal reporting of adopted open pit stability controls will be conducted quarterly.
GT7	A Void Management Plan will be prepared to address the interaction between simultaneous open pit and underground mining operations.
GT8	A Ground Control Management Plan will be developed, which will include void management procedures and monitoring requirements.
GT9	Underground stopes will be non-personnel entry, with all equipment remotely operated from outside the stope, in accordance with normal underground mining processes.
GT10	Surface prism monitoring for underground stability on sensitive receptors will be undertaken in combination with open pit prism monitoring. The prism monitoring will be effective in measuring subsidence and consistent with industry best practices.
GT11	Ongoing underground stope monitoring (including stope over break) will be undertaken and designs reviewed in accordance with monitoring results.
GT12	Geotechnical reviews will be conducted quarterly to annually.
GT13	The WRE and HLP landforms will be designed in accordance with good construction practices for water management, including limiting water ponding, avoiding the creation of perched water tables and surface water management with reverse-graded berms, drains and drop structures.

Appendix D1: LAND AND SOIL CAPABILITY ASSESSMENT

Appendix D2: WATER IMPACT ASSESSMENT PROJECT AMENDMENT REPORT

Appendix D3: FLOODING AMENDMENT REPORT

Appendix D4: FINAL BDAR REPORT

Appendix D5: AIR QUALITY AND NOISE AMENDMENT REPORT

Appendix D6: ACHA ADDENDUM

Appendix D7: SOCIAL IMPACT ADDENDUM REPORT

Appendix D8: ADDENDUM ECONOMICS REPORT

Appendix D9: TRANSPOR AMENDMENT REPORT

Appendix D10: VISSUAL IMPACT ASSESSMENT LETTER

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4 July 2025

Principal Environment & Mine Closure Planning

Aeris Resources Pty Ltd

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Attention: Gemma Brown

CONSTELLATION PROJECT – LAND AND SOIL CAPABILITY ASSESSMENT – REALIGNING THE INFRASTRUCTURE CORRIDOR ASSOCIATED WITH LOT 13 DP751311, LOT 19 DP751311 AND LOT 2 DP1296861

The following letter contains a land and soil capability assessment for the realignment of the infrastructure corridor associated with Lot 13 DP751311, Lot 19 DP751311 and Lot 2 DP1296861 (the realignment footprint). The findings are supported by desktop assessment and field survey outcomes from the Constellation Project Land and Soil Capability Assessment (AARC 2024).

Introduction

Aeris Resources Pty Ltd (Aeris) seek to amend the Constellation Project description as a result of engineering design refinements and stakeholder engagement. The relevant amendment is to realign the infrastructure corridor associated with Lot 13 DP751311, Lot 19 DP751311, and Lot 2 DP1296861:

- to redesign road curves; and
- accommodate road registered trucks sized up to AB triples re- alignments with 70 t payloads.

AARC undertook a Land and Soil Capability Assessment for the Project, involving a field assessment of the Soil Survey Study Area in January 2023 (AARC 2024).

The realignment footprint is directly adjacent to the Study Area (AARC, 2024) and is an area of 9.3 ha (Figure 1). The assessment has drawn inferences and a conclusion about soil characteristics and capability based on desktop analysis and existing field survey data from the adjacent Study Area.

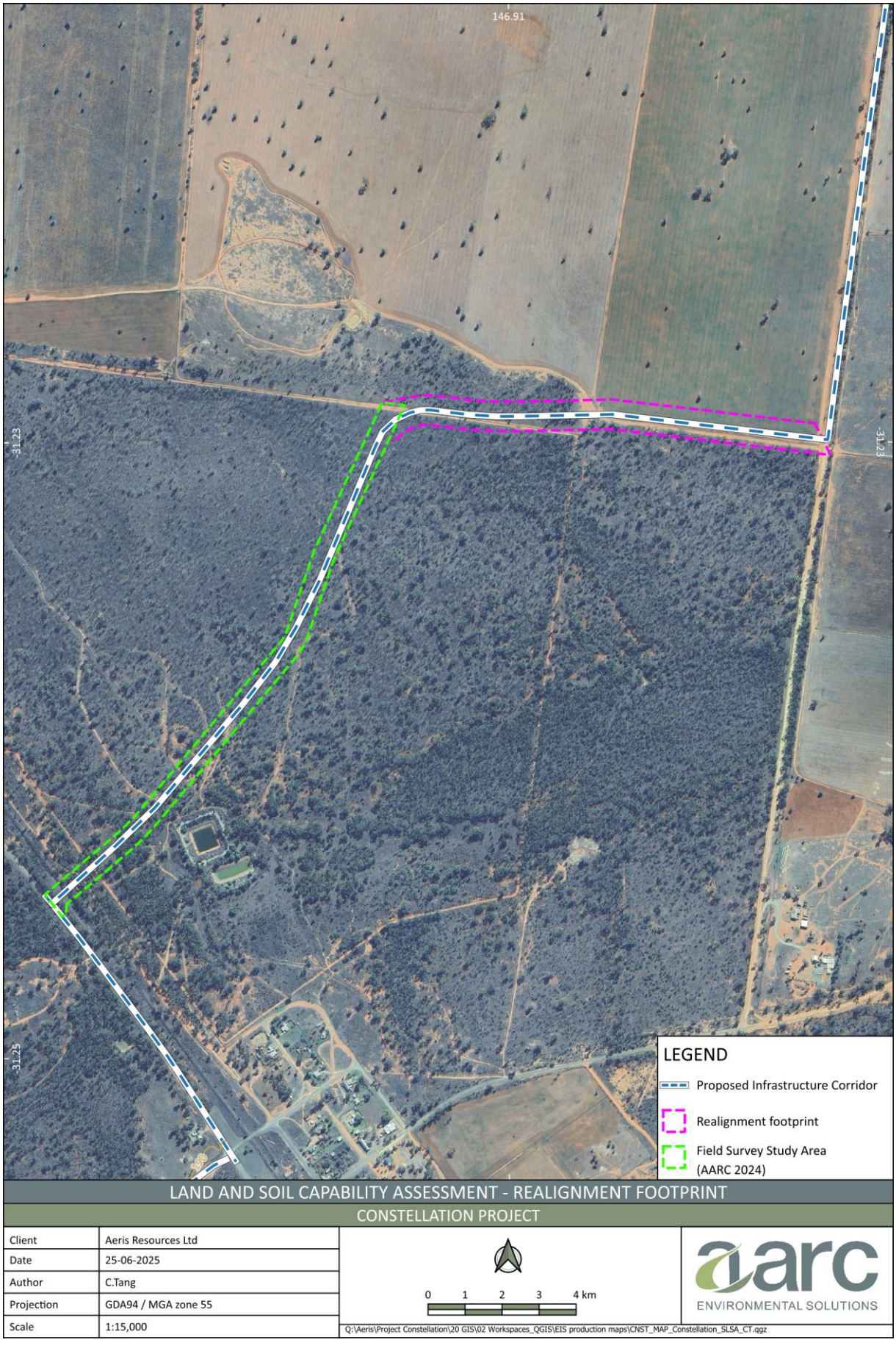


Figure 1: Realignment footprint and 2024 Soil Survey Study Area

Desktop Assessment

The following land and soil characteristics were determined by a desktop analysis for the realignment footprint.

- Land system mapping describes the landscape surrounding the realignment footprint as an undulating pediplain with low ridges, drainage lines and residual higher peaks, termed the Cobar land system (Walker 1991). Based on review of aerial imagery and elevation models, the landform is specifically characterised by:
    - Ridge crests and upper slopes, with slopes of up to 5% (Figure 2);
    - Soils of loamy or sandy texture with shallow acid red earths, plentiful surface quartz gravel and rock fragments;
    - Minor to severe watersheeting from residual hills to the west (Figure 2); and
    - Poplar Box – Gum Coolabah – Cyprus Pine shrubby woodland (Ecoplanning 2024).
- The Australian Soil Classification Soil Type of the realignment footprint is mapped as Rudosols (DPIE 2021a). Rudosols are characterised by negligible pedologic organisation and are typically apedal or only weakly structured in the soil surface (A1) horizon (Isbell and NCST 2021).
- Surface geology mapping indicates a distribution of the following lithology within the vicinity of the realignment footprint (DPIRD 2009):
    - Ordovician sedimentary rocks – interbedded quartz-rich sandstone, siltstone and mudstone deposited in turbidity currents along the continental slope.
    - Quaternary alluvial deposits – current and recent mud, silt, sand and gravel deposited by alluvial systems.

  The deposition of loose sediments formed by water sheeting from residual hills to the west is implied to be relatively recent and young. The young deposit has not yet undergone consolidation, weathering, or sufficient biological activity to initiate soil profile development, thereby supporting its classification as a Rudosol.
- Land and soil capability mapping classifies the realignment footprint as being Class 6 with very severe limitations (DPIE 2021b). The land capability Class 6 is characterised as suited for low-impact land uses such as grazing, forestry or nature conservation (OEH 2012).

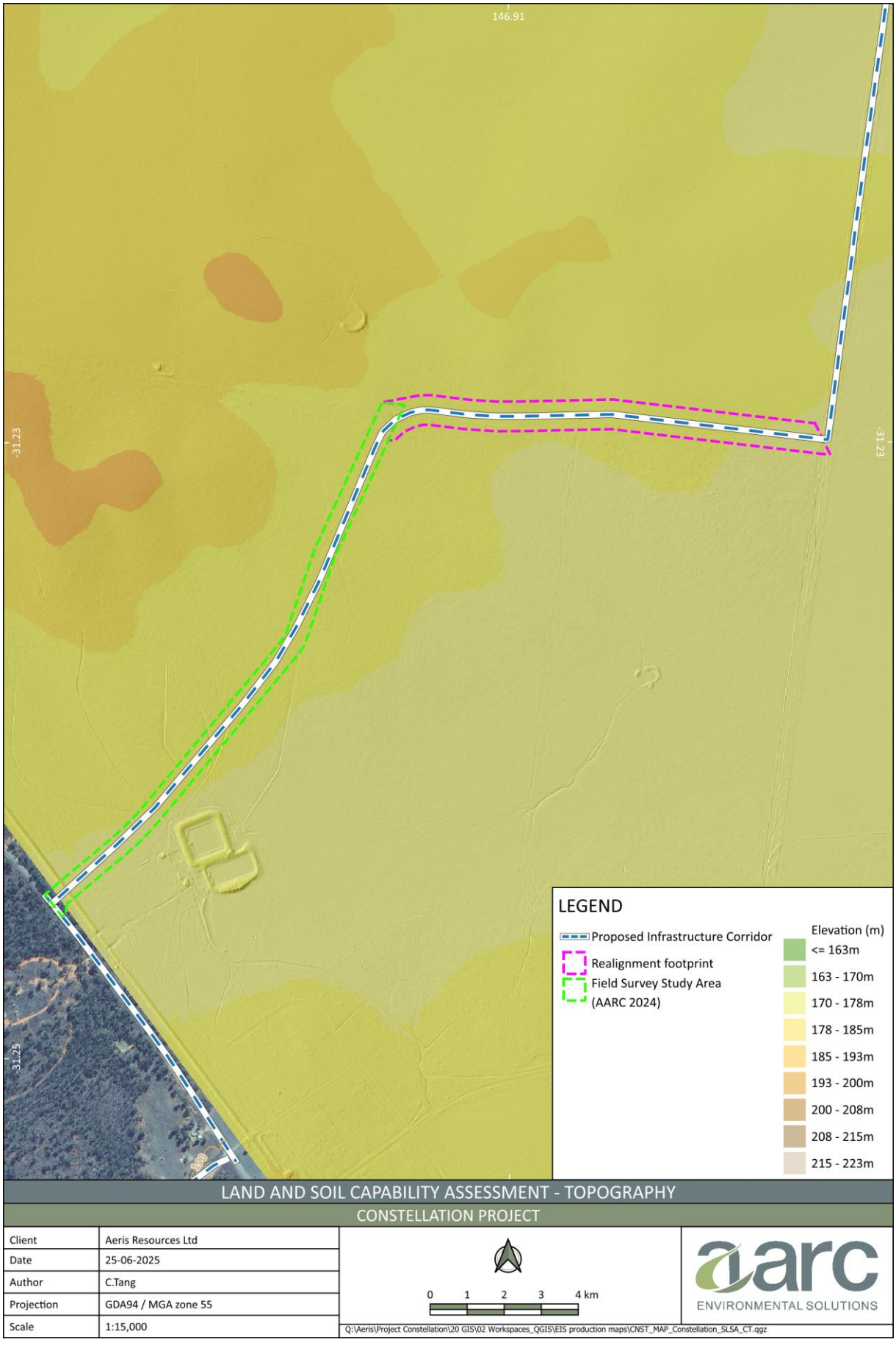


Figure 2: Topography within the realignment footprint and surrounds

Review of existing field survey data

The AARC (2024) field survey identified the majority of the Study Area as Kandosols (64.5%) with some Rudosols (16.6%). Kandosols were distributed on gently inclined or level landforms across the majority of the Study Area, while Rudosols were associated with stony hills within the Study Area. The soil types were classified into three soil management units (SMUs), namely Colluvial, Sandstone and Alluvial SMUs.

Discussion

A comparison of the desktop assessment and field survey outcomes has concluded that the land characteristics observed in the adjacent field survey for the realignment footprint were consistent with the government mapped characteristics. The realignment footprint is inferred to be consistent with the Sandstone SMU, described with an apedal sandy loam soil texture throughout and classified as a Brown Rudosol.

The land capability class of the Sandstone SMU applies to the realignment footprint, being Class 7 with very low capability and restricting most land uses (AARC 2024). The realignment footprint generally cannot overcome these limitations and is recommended to support selective forestry or nature conservation land uses. The realignment footprint is most limited by water erosion, shallow soils and rockiness.

The impacts to soil and land from Project disturbance (haul road construction) are expected to be minimal if the soil and land is managed by implementing the Project's Erosion and Sedimentation Control Plan (ESCP) to reduce risk of erosional impacts.

Yours sincerely

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Senior Environmental Scientist
AARC Environmental Solutions
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Reference List

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Constellation Project Amendment Report

Water Impact Assessment

Aeris Resources Pty Limited

3 July 2024

The Power of Commitment

Project name		Constellation Project Groundwater Assessment					
Document title		Constellation Project Amendment Report | Water Impact Assessment					
Project number		12575595					
File name		12575595-REP_ Project Amendment Report.docx					
Status Code	**Revision**	**Author**	**Reviewer**		**Approved for issue**		
			Name	**Signature**	**Name**	**Signature**	**Date**
S4	0	M. Monroe	S. Gray		P. Youman		03/07/25

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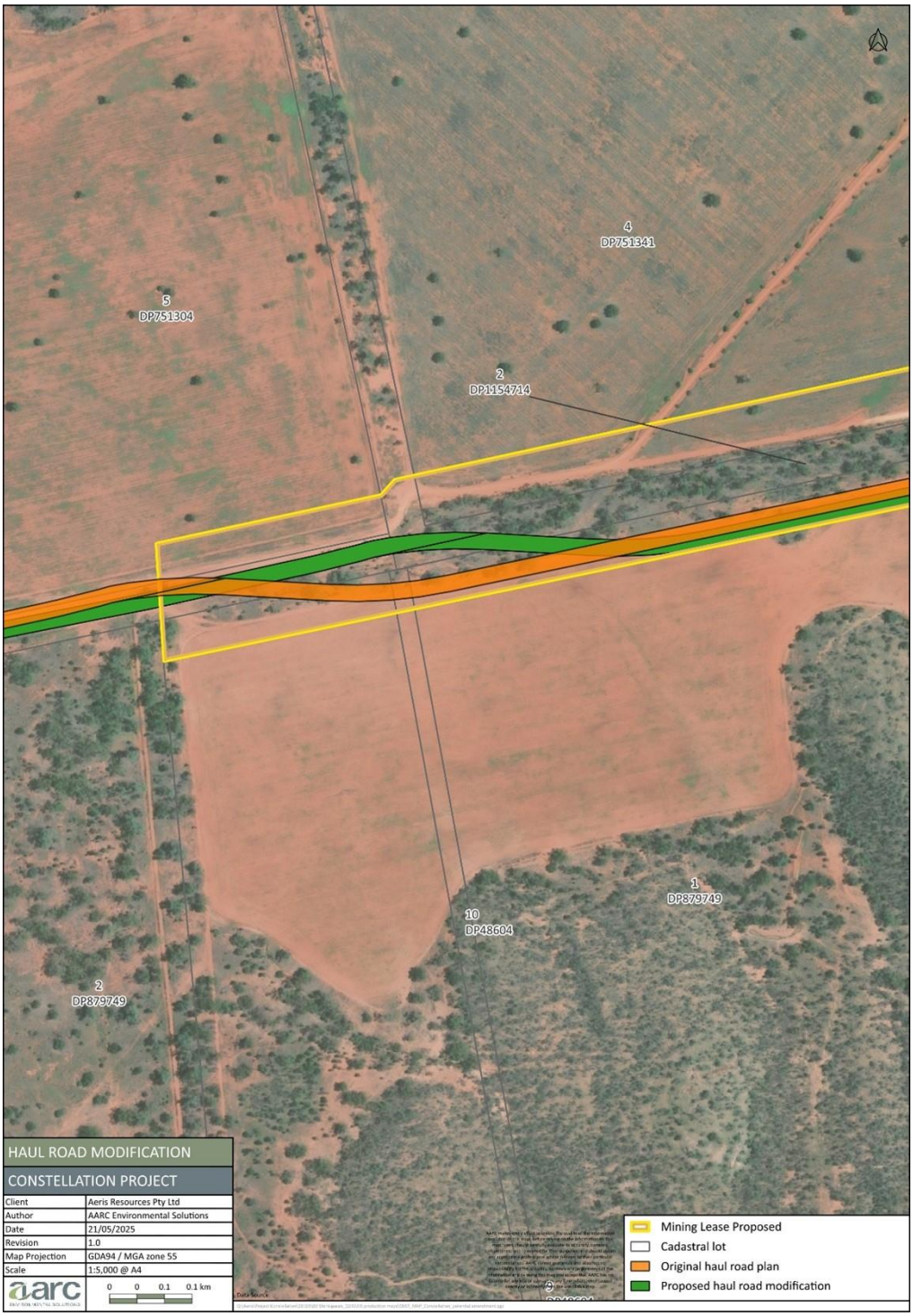
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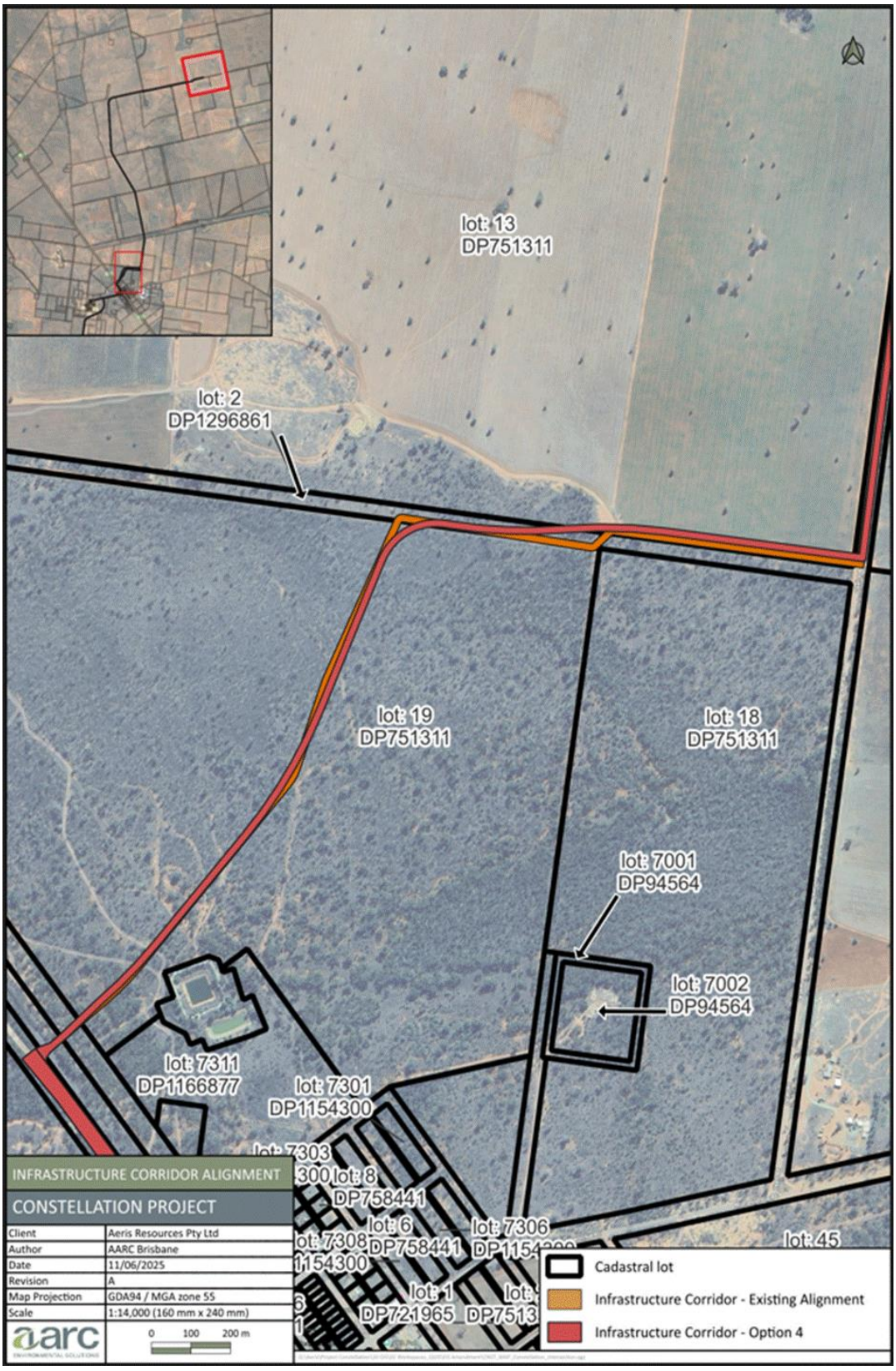
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2. Impact assessment

2.1 Site water management

The alteration of the access road alignment and construction hours are not anticipated to alter site water management requirements. No changes to the proposed construction methodology or operational requirements are proposed. Therefore, no change to site water management requirements presented in the Constellation Project Water Impact Assessment (GHD 2024) is required.

The proposed project amendments are not anticipated to alter the site water balance modelling findings presented in the Constellation Project Water Impact Assessment (GHD 2024).

The proposed amendments of altering construction hours and minor road realignment in two segments of the proposed access road are unlikely to alter the water demands associated with construction of the project. Based on these minor alterations, it is anticipated that there will be negligible impact to the reported site water balance.

No additional water management infrastructure is proposed to cater for the proposed amendments described in Section 1.1. It is anticipated that all construction works would be undertaken in accordance with Managing Urban Stormwater: Soils and Construction - Volume 2C Unsealed Roads (DECC 2008).

2.2 Hydrology and flow regimes

2.2.1 Change in catchments

The amendment of the proposed access road alignment in two segments will result in negligible change in surface water catchment area approaching the access road. Shifting the access road slightly north and south of the existing road alignment will result in negligible impacts to the catchment area impacting the access road. Therefore, it is anticipated there will be similar impact to the hydrology flow regimes due to the minor alteration of the road alignment, in consideration of the current proposal under the Constellation Project EIS.

2.3 Surface water quality

There are no material changes to the project that may otherwise generate new potential pollutants. In addition, no change to the construction methodology is required. Therefore, no changes to the potential water quality impacts and proposed surface water quality monitoring program for the Project are required.

2.4 Groundwater

The road realignment and installation of underground services are not anticipated to intercept groundwater, based on the likely minimal depths of trenching and groundwater depths in the vicinity of the project being greater than 10 m below the surface at monitoring bore locations (GHD 2024). There are no other elements of the proposal that would alter the groundwater modelling results or impact assessment per GHD (2024).

2.5 Licensing requirements

No changes to the previously assessed water licensing requirements due to these proposed project amendments are anticipated to be required.

3. Flood impact assessment

3.1 Project impacts on flooding

Per findings in GHD (2025), it was identified that existing road access, and the proposed access road will incur minimal changes to the existing flood characteristics.

The realignment of the proposed access road will retain the characteristics of the current EIS conditions. The modified access road alignment is anticipated to:

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Based on the above, it is anticipated the modified road alignment to have a negligible impact on the flood modelling outcomes in the EIS to date, should the road characteristics be met.

4. Conclusions

As highlighted throughout this document, the functionality of construction, operation and maintenance of the access road alignment does not alter as proposed in the EIS. Aeris' proposed amendments to construction hours and minor access road realignment provides a negligible change to the impact to surface water, groundwater and flooding identified in GHD (2024) and GHD (2025).

The access road alignment will be required to meet the surface level to that proposed for the EIS, to reflect the conditions of the existing access road alignment nominated in the EIS. Should the access road alignment be raised, flood modelling will be required to be undertaken.

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Constellation Project Amendment Report

Water Impact Assessment

Aeris Resources Pty Limited

3 July 2024

The Power of Commitment

Project name		Constellation Project Groundwater Assessment					
Document title		Constellation Project Amendment Report | Water Impact Assessment					
Project number		12575595					
File name		12575595-REP_ Project Amendment Report.docx					
Status Code	**Revision**	**Author**	**Reviewer**		**Approved for issue**		
			Name	**Signature**	**Name**	**Signature**	**Date**
S4	0	M. Monroe	S. Gray		P. Youman		03/07/25

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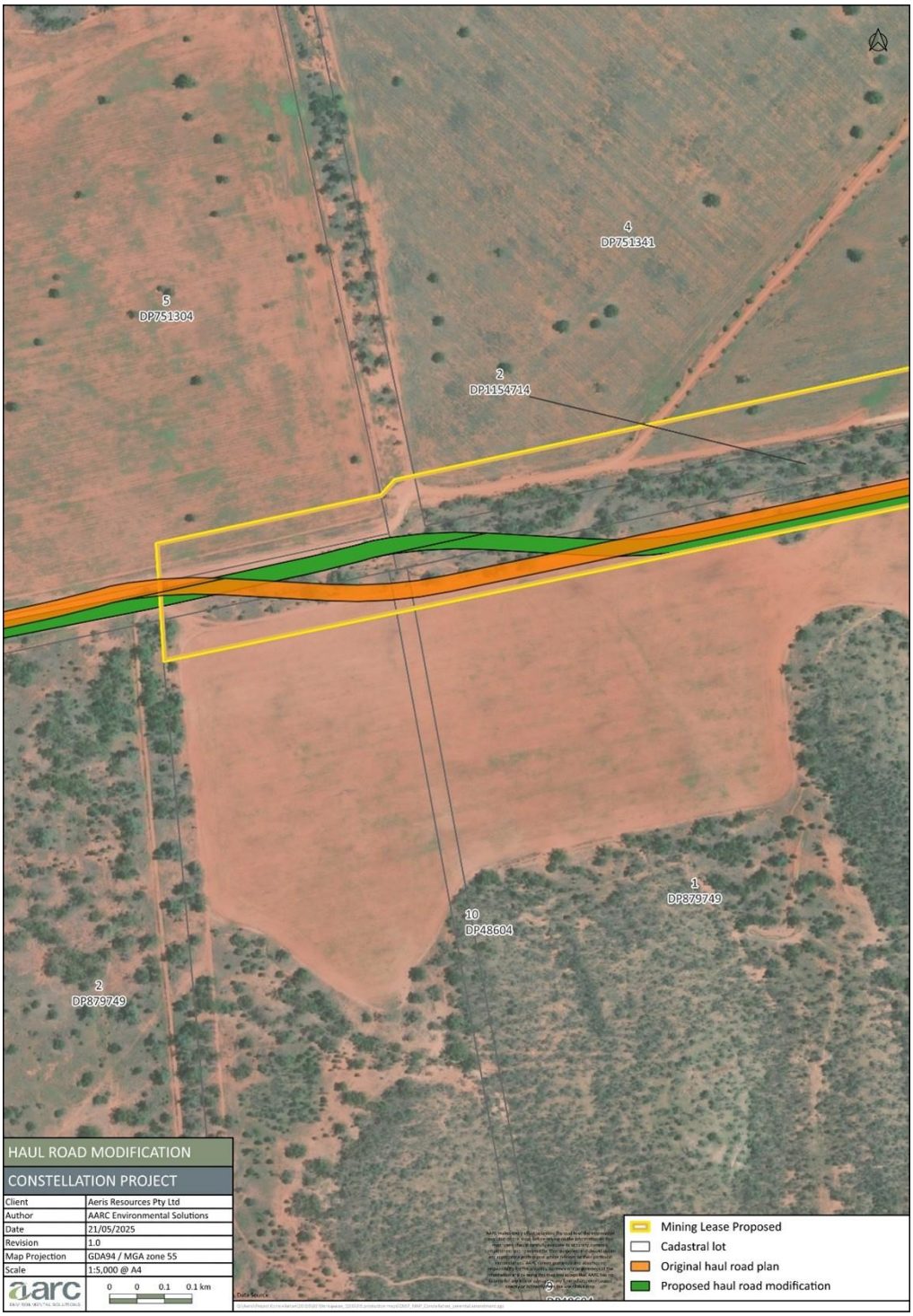
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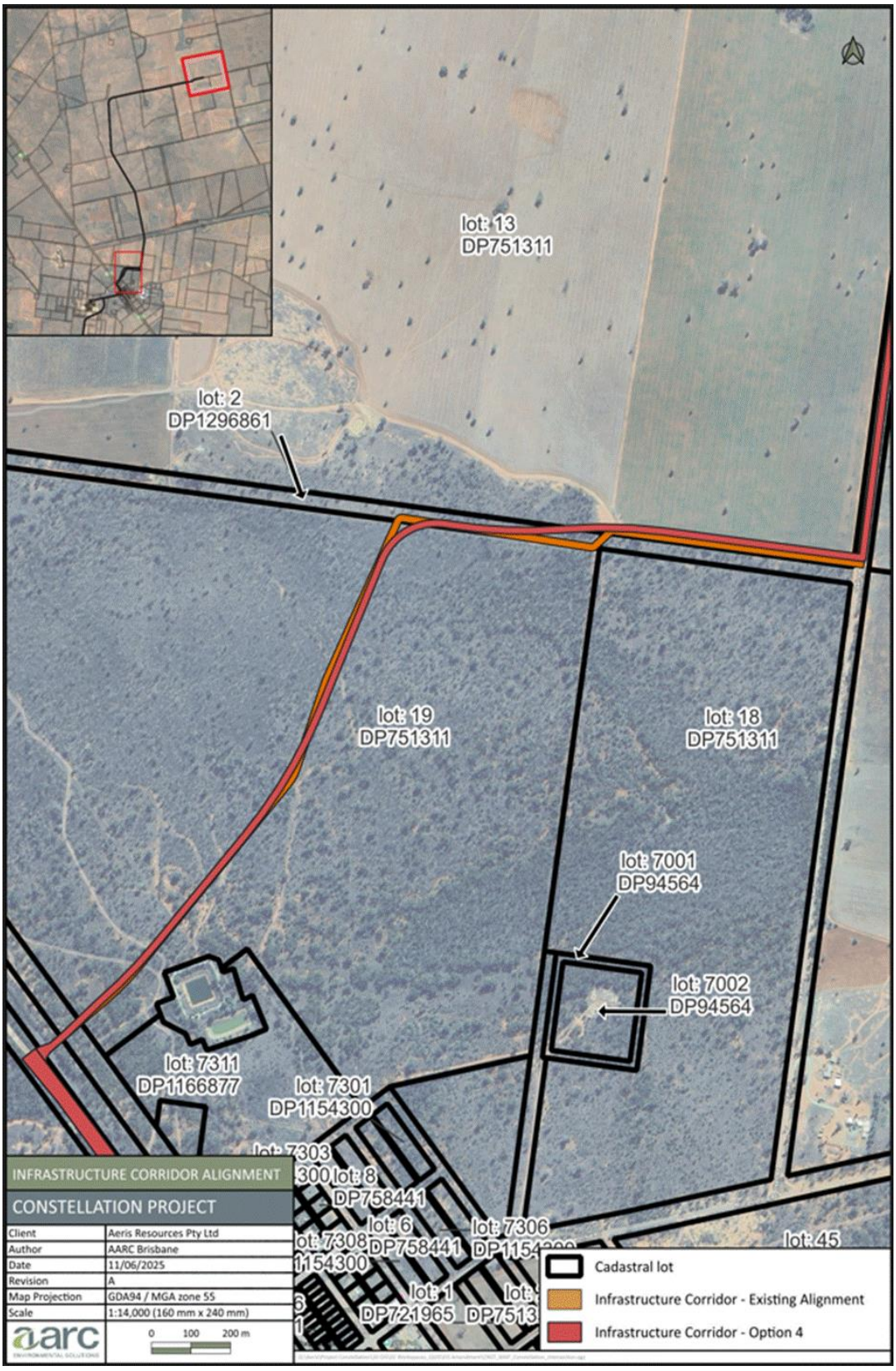
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Biodiversity Development Assessment Report



Constellation Project, Girilambone, NSW

Prepared for: Aeris Resources Ltd

1 August 2025 Version: 2.3 – Final

PROJECT NUMBER	2021-134			
PROJECT NAME	Biodiversity Development Assessment Report			
PROJECT ADDRESS	Constellation Project, Girilambone, NSW			
PREPARED FOR	Aeris Resources Ltd			
AUTHOR/S	Nicholas Agostino, Bruce Mullins			
REVIEW	**Technical**	**QA**	**Version**	**Date to client**
	Bruce Mullins		1.1 - Draft	14 June 2023
			1.2 - Draft	22 December 2023
			1.3 - Final	24 April 2024
			1.4 - Final	16 May 2024
			1.5 – Final	28 May 2024
			1.6 - Final	24 June 2024
			1.7 - Final	24 January 2025
			1.8 – Final	27 February 2025
			1.9 – Final	9 May 2025
	Bruce Mullins, Jo Daly		2.0 – Final	18 July 2025
			2.1 – Final	24 July 2025
			2.2 – Final	29 July 2025
			2.3 – Final	1 August 2025
BDAR CERTIFICATION	This BDAR has been prepared by Bruce Mullins Accredited Assessor no. BAAS17024, in accordance with the BC Act, Reg and BAM.			

LICENCES	**Scientific Licence**	SL101557
	BioNet Sensitive Species Data Licence	1115
	Animal Research Authority Ethics Licence	Fauna Surveys and Monitoring (16/346)

This report should be cited as: 'Ecoplanning (2025). Biodiversity Development Assessment Report– Constellation Project, Girilambone, NSW. Prepared for Aeris Resources Ltd.'

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Declarations

Certification under clause 6.15 *Biodiversity Conservation Act 2016.*

I certify that this report has been prepared based on the requirements of, and information provided under, the Biodiversity Assessment Method and clause 6.15 of the *Biodiversity Conservation Act 2016* (BC Act).

This BDAR has been prepared to meet the requirements of BAM (DPIE 2020a).

I declare that I have considered the circumstances and there is no actual, perceived or potential conflict of interest.

This declaration has been made in the interests of full disclosure to the decision-maker. Full disclosure has also been provided to the client.

Signature:



Date: 1 August 2025

Bruce Mullins

BAM Assessor Accreditation no: BAAS17024

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Glossary and abbreviations

Acronym	Description
AoS	Assessment of Significance
BAAS	Biodiversity Accredited Assessor System
BAM	Biodiversity Assessment Method (DPIE 2020a)
BAM-C	Biodiversity Assessment Method calculator
BC Act	NSW *Biodiversity Conservation Act 2016*
BC Reg	NSW *Biodiversity Conservation Regulation 2017*
BDAR	Biodiversity Development Assessment Report
BOS	Biodiversity Offset Scheme
BVM	Biodiversity Values Map
CEEC	Critically Endangered Ecological Community
CEMP	Construction Environmental Management Plan
DA	Development Application
DP	Deposited Plan
Commonwealth DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
DECC	Department of Environment and Climate Change
DIWA	Directory of Important Wetlands
DNG	Derived native grassland
DotE	Commonwealth Department of the Environment (now Commonwealth DCCEEW)
DoEE	Commonwealth Department of the Environment and Energy (now Commonwealth DCCEEW)
DPE	NSW Department of Planning and Environment (now NSW DCCEEW)
DPIE	NSW Department of Planning, Industry and Environment (now NSW DCCEEW)
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
Ha	Hectare

Acronym	Description
HBT	Hollow bearing tree
HTE	High threat exotic
IBRA	Interim Biogeographic Regionalisation of Australia
LEP	Local Environment Plan
LGA	Local Government Area
LPI	Land and Property Information
OEH	NSW Office of Environment and Heritage
OTG	Offset Trading Group
PCT	Plant Community Type
PMST	Protected Matters Search Tool
SAII	Serious and Irreversible Impacts
SSD	State Significant Development
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community
TSSC	Threatened Species Scientific Committee
VI	Vegetation Integrity

1 Introduction

1.1 Background

Aeris Resources Ltd (the proponent, Aeris) are proposing the establishment of a copper mine, associated infrastructure and haul road ('infrastructure corridor') at the land hereby referred to as the 'subject land'. The proposed mine is referred to as the "Constellation Project" (the Project).

This Biodiversity Development Assessment Report (BDAR) has been prepared to accompany a Development Application (DA) relating to the Project. The Project includes parts of Lot 4 // DP 751304, Lots 13 and 19 // DP 751311, Lots 9 and 10 // DP 751321, Lot 4 // DP 751341, Lot 1 // DP 879749, Lot 2 // DP 1154714, Lot 6464 // DP 1203638, Lot 1 // DP 1256374 and Lot 2 // DP 1296861, Girilambone, NSW, 2831 (**Figure 1.1**, **Figure 1.2**, **Figure 1.3** and **Figure 1.4**).

The Constellation Project (the Project) is located in the 'Bogan Shire' local government area (LGA) of central-western New South Wales. The Project site is located approximately 20 kilometres (km) north-east of the township of Girilambone and approximately 55 km north-west of Nyngan.

The Project is proposed as a satellite site of Tritton Copper Operations (owned and operated by Aeris). Tritton Copper Operations operates as a hub and spoke model with Tritton Copper Mine serving as the hub (where the processing facility is located) and other surrounding deposits supplying ore for processing. The Project is located approximately 45 km north-east of the Tritton processing plant.

The Project proposes mining of copper ore, through development of an open cut pit and underground mine. Mined ore will be transported via road to the Tritton processing plant for processing, with lower grade oxide ore processed by heap leaching at the Project site. Transport of dewatered tailings material from Tritton Copper Mine (back to the Project site for use in cemented paste fill) will support the underground mining activities. Final rehabilitation of the Project site will occur after mining activities are complete.

The Project proposes to mine an average of 500,000 tonnes of copper ore per annum to replace depleting production at the Tritton processing plant. Production of ore in any given period would achieve peak volumes of up to 1 million tonnes per annum. Production during operations will vary, as open cut mining is completed, and underground operations ramp up. The anticipated mine life is approximately 16 years, inclusive of a Project construction period and rehabilitation/closure period. There is potential for mine life extensions as the deposit is developed down plunge.

This BDAR has been prepared by Bruce Mullins, an Accredited Assessor (BAAS17024) in accordance with the NSW *Biodiversity Conservation Act 2016* (BC Act) and NSW *Biodiversity Conservation Regulation 2017* (BC Reg), and is consistent with the Biodiversity Assessment Method (BAM; DPIE [2020a]).

The BC Act establishes the biodiversity assessment requirements for proposed developments and land use. The BC Act establishes an offsets scheme which aims to ensure there is no net loss of biodiversity values. Entry into the BC Reg can come about through any combination of four triggers:

- **State significant development** – if a future development was determined to be State Significant Development, Secretary's Environmental Assessment Requirements would be issued for the project, requiring that biodiversity impacts related to the proposed development be assessed using the BAM (DPIE 2020a) and documented in a BDAR.
- **Clearing thresholds** – the amount of vegetation clearance in relation to the minimum lot size is used to determine whether entry into the BAM is triggered (**Table 1.1**).
- **Biodiversity Values Map** - Proposed development is said to exceed the biodiversity threshold where it involves the clearing of native vegetation on land included in the Biodiversity Values Map (BVM; DPE (2023a)).
- **Significant impact** – A Test of Significance (in accordance with Part 7.3 of the BC Act) is required for development proposals that are not situated on the BVM and that do not exceed the Biodiversity Offset Scheme (BOS) clearing thresholds. If the Test of Significance indicates that there is likely to be a significant impact, the proponent must carry out an assessment in accordance with the BAM.

Review of the study area finds that clearing associated with the proposal triggers the BOS, as the proposed development exceeds the area clearing threshold of 1 ha for the minimum lot size of the study area, which is 600 ha (**Table 1.1**). The subject land is defined as the land of the main Project area and infrastructure corridor in which impacts are required (an area of approximately 184.91 ha). The project also qualifies as a State Significant Development (SSD).

Table 1.1: Clearing threshold for each minimum lot size which would require entry into the BAM and the Biodiversity Offset Scheme.

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 1,000 ha	1 ha or more
1,000 ha or more	2 ha or more

This BDAR describes the outcome of the development assessment case (00047700/BAAS17024/24/00047703) conducted consistent with the BAM.

1.2 Response to SEARs

This BDAR has been prepared to satisfy the Project's Planning Secretary's Environmental Assessment Requirements (SEARs) for SSD 41579871. Relevant SEARs to this document and identified in **Table 1.2**.

Table 1.2: Relevant SEARs and report reference

SEARs requirement	Report reference
An assessment of the likely biodiversity impacts of the development in accordance with the Biodiversity Assessment Method (BAM), and documented in a Biodiversity Development Assessment Report (BDAR).	This document
A strategy to offset any residual impacts of the development in accordance with the offset rules under the Biodiversity Offsets Scheme, including details of any potential biodiversity stewardship sites for retiring biodiversity credits.	Section 7

In addition to the SEARs, the Biodiversity Conservation Division (BCD) and Mining, Exploration and Geoscience (MEG) have provided further recommendations on biodiversity information to be addressed within the EIS. These recommendations are outlined in **Table 1.3**.

Table 1.3: Relevant agency advice

Agency	Agency advice	Report reference
Biodiversity, Conservation Division (BCD)	Biodiversity impacts related to the proposed development are to be assessed in accordance with Section 7.9 of the Biodiversity Conservation Act 2016 the Biodiversity Assessment Method 2020 and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must include information in the form detailed in the Biodiversity Conservation Act 2016 (s6.12), Biodiversity Conservation Regulation 2017 (s6.8) and Biodiversity Assessment Method 2020, unless the Department determines that the proposed development is not likely to have any significant impacts on biodiversity values.	This document
	The BDAR must document the application of the avoid, minimise, and offset framework; including assessing all direct, indirect, uncertain and prescribed impacts in accordance with the Biodiversity Assessment Method 2020.	Chapter 6, Section 6.1
	The BDAR must include details of the measures proposed to address the offset obligation as follows: • The total number and classes of biodiversity credits required to be retired for the development/project; • The number and classes of like-for-like biodiversity credits proposed to be retired;	Chapter 8, Section 8.1.1, 8.12 Chapter 8, Section 8.1.1, 8.12

Agency	Agency advice	Report reference
	• The number and classes of biodiversity credits proposed to be retired in accordance with the variation rules;	
	• Any proposal to fund a biodiversity conservation action;	Chapter 8, Section 8.2
	• Any proposal to conduct ecological rehabilitation (if a mining project);	
	• Any proposal to make a payment to the Biodiversity Conservation Fund.	
	If seeking approval to use the variation rules, the BDAR must contain details of the reasonable steps that have been taken to obtain requisite like-for-like biodiversity credits.	N/A
	The BDAR must be submitted with all spatial data associated with the survey and assessment as per Appendix K of the BAM.	This document
	The BDAR must be prepared by a person accredited in accordance with the Accreditation Scheme for the Application of the Biodiversity Assessment Method Order 2017 under s6.10 of the Biodiversity Conservation Act 2016.	Chapter 1, Section 1.1
	The EIS must map the following features relevant to water and soils including: · Rivers, streams, wetlands, estuaries (as described in s4.2 of the Biodiversity Assessment Method);	Chapter 2, Figure 2.1
Mining, Exploration and Geoscience (MEG)	MEG requests that the Proponent consider potential resource sterilisation in relation to any proposed biodiversity offsets areas. Biodiversity offsets have the potential to preclude access for future resource discovery and extraction and could also potentially permanently sterilise access to mineral resources.	No offsets are proposed within the study area or proximity to the study area
	The EIS must, therefore, clearly illustrate the location (including offsite locations) of any biodiversity offsets being considered for the project and their spatial relationship to known and potential mineral and construction material resources and existing mining and exploration titles.	
	MEG requests consultation with both the Geological Survey of NSW – Land Use Assessment team and holders of existing mining and exploration authorities affected by planned biodiversity offsets. Evidence of consultation should be included in the EIS	

1.3 Location and site identification

The BAM defines the land to which the BDAR applies as the subject land, which includes areas that are proposed to be directly and indirectly impacted. For the purposes of this BDAR, the subject land, being the land requiring land disturbance and vegetation clearing, includes approximately 184.91 ha of land within Lot 4 // DP 751304, Lots 13 and 19 // DP 751311, Lots 9 and 10 // DP 751321, Lot 4 // DP 751341, Lot 1 // DP 879749, Lot 2 // DP 1154714, Lot 6464 // DP 1203638, Lot 1 // DP 1256374 and Lot 2 // DP 1296861 (**Figure 1.1** and **Figure 1.2**). No direct or indirect impacts are proposed to areas outside the subject land. The subject land is part of a DA to establish a resources extraction project. The associated infrastructure required for these works includes a proposed infrastructure corridor which requires minor upgrades to and deviations from Okeh Road (a public road). The majority of the infrastructure corridor has been designed to fit within the existing disturbed extent of Okeh Road, thereby requiring no impacts to native vegetation (**Figure 1.3**). The Project area also refers to a haul road to Tritton mine and the buried pipeline which require no vegetation removal (**Figure 1.4**).

The subject land is situated in the Bogan Shire Local Government Area (LGA) and is zoned RU1 – Primary Production under the Bogan Local Environment Plan (Bogan LEP 2011). The subject land is located approximately 20 km north-east of the township of Girilambone, and approximately 55 km north-northwest of Nyngan, NSW, adjacent to the Mitchell Highway. The site is located within a large expanse of rural lands stretching between Nyngan and Bourke, which is to the north west of the subject land. The subject land includes the main Project area in which the mine and associated infrastructure will be located (an area of approximately 159.77 ha) and an area of linear development for linking the infrastructure corridor route between the Mitchell Highway and Okeh Road which includes minor upgrades to and deviations from Okeh Road (an area of approximately 23.23 ha, which includes a realignment on Lot 19 DP751311, Lot 13 DP751311 and Lot 2 DP1296861; and a realignment to avoid Lot 10 DP48604) and a buried pipeline (an area of approximately 1.91 ha). The infrastructure corridor extends mostly north and east from the Mitchell Highway to the proposed open cut mine and associated mining infrastructure, with the 'Project area' constituting all activity within the subject land as well as a buried pipeline that will be installed in the existing access road and previously disturbed land associated with the entrance road to Murrawombie Mine. The southern end of the infrastructure corridor (**Figure 1.2**) will connect with the existing haul road to Murrawombie and Tritton Mines (**Figure 1.4**). No additional disturbance is required for the establishment of the infrastructure corridor south of the Mitchell Highway. The total disturbance footprint of the project is 184.91 ha, 97.53 ha of which constitutes native vegetation that will be directly impacted by the proposal.

The subject land is surrounded by cleared agricultural lands use for grazing and cropping, and largely contiguous areas of native woodland. The landscape is gently undulating, with rocky rises present in the east beyond the subject land. The Bogan River is approximately 8 km east of the subject land at its closest point. A strip of native woodland vegetation intersects the gravel road in-between the road and agricultural fields further south to the mine footprint and will be partially impacted by the proposed infrastructure corridor. To the north of the subject land, low rocky hills, which are largely uncleared, are surrounded by cleared agricultural fields on flat land.

1.4 Proposed development

Aeris propose to establish a mining operation at the subject land. The Project proposes mining of copper ore, through development of an open cut pit and underground mine. Mined ore will be transported via road to the Tritton processing plant for processing, with lower grade oxide ore processed by heap leaching at the Project site. The remainder of the haul road from Murrawombie Mine to the Tritton Mine is an existing approved haul road (for the Murrawombie Mine to Tritton Mine connection). This section of approved haul road and infrastructure corridor south of the highway is, therefore, not considered within the scope of this assessment. A buried pipeline will be installed from the intersection of Railway Rd and the Mitchell Hwy. The pipeline will be buried beneath the existing road and will not require any clearing of native vegetation. Transport of dewatered tailings material from Tritton Mine (back to the Project site for use in cemented paste fill) will support the underground mining activities. Final rehabilitation of the Project site will occur after mining activities are complete.

Supporting infrastructure for the proposed Project will include development of:

- a road upgrade (where necessary) between the Project site and the Mitchell Highway (to support haulage activity), noting that a large section of the existing Okeh Road will be used in the infrastructure corridor;
- a new T-intersection to link the proposed infrastructure corridor with the eastern side of the Mitchell Highway (north of Girilambone);
- A bi-directional water supply pipeline that will be buried within the infrastructure corridor from the Project area to Murrawombie and Tritton Copper mines. The pipeline will pass under the Mitchell Hwy, and will not require additional clearing.
- an upgrade to the intersection of the Mitchell Highway with Railway Road (west of Girilambone);
- a waste rock emplacement at the Project site;
- a run of mine stockpile to support the handling of mined ore;
- a mine laydown area and workshop;
- a heap leach pad and associated processing facility;
- a paste plant, emulsion storage and shotcrete batch plant;
- topsoil stockpiles;
- a solar farm and on-site power station;
- water management and storage infrastructure, including a bi-directional water pipeline between the Project site and Murrawombie Copper Mine. The pipeline from the intersection of Railway Rd and the Mitchell Hwy will be buried within the existing road corridor; and
- administrative facilities including offices, amenities, and car park.

Figure 1.5 shows these features in the Project area. **Figure 1.6** shows an indicative cross section of the infrastructure corridor, including the buried pipeline, optic fibre and electrical conduit within the infrastructure corridor footprint.

We note that the Project area and subject land has changed during the initial preparation of the BDAR and project development, and slowly reduced in size to reduce the potential impact of the project on the environment. This revision proposes a marginal 0.16 ha increase in area.



Figure 1.1: Subject land (north), Constellation proposal (Project area) and infrastructure corridor requiring impacts.



Figure 1.2: Subject land (south) showing infrastructure corridor requiring impacts.

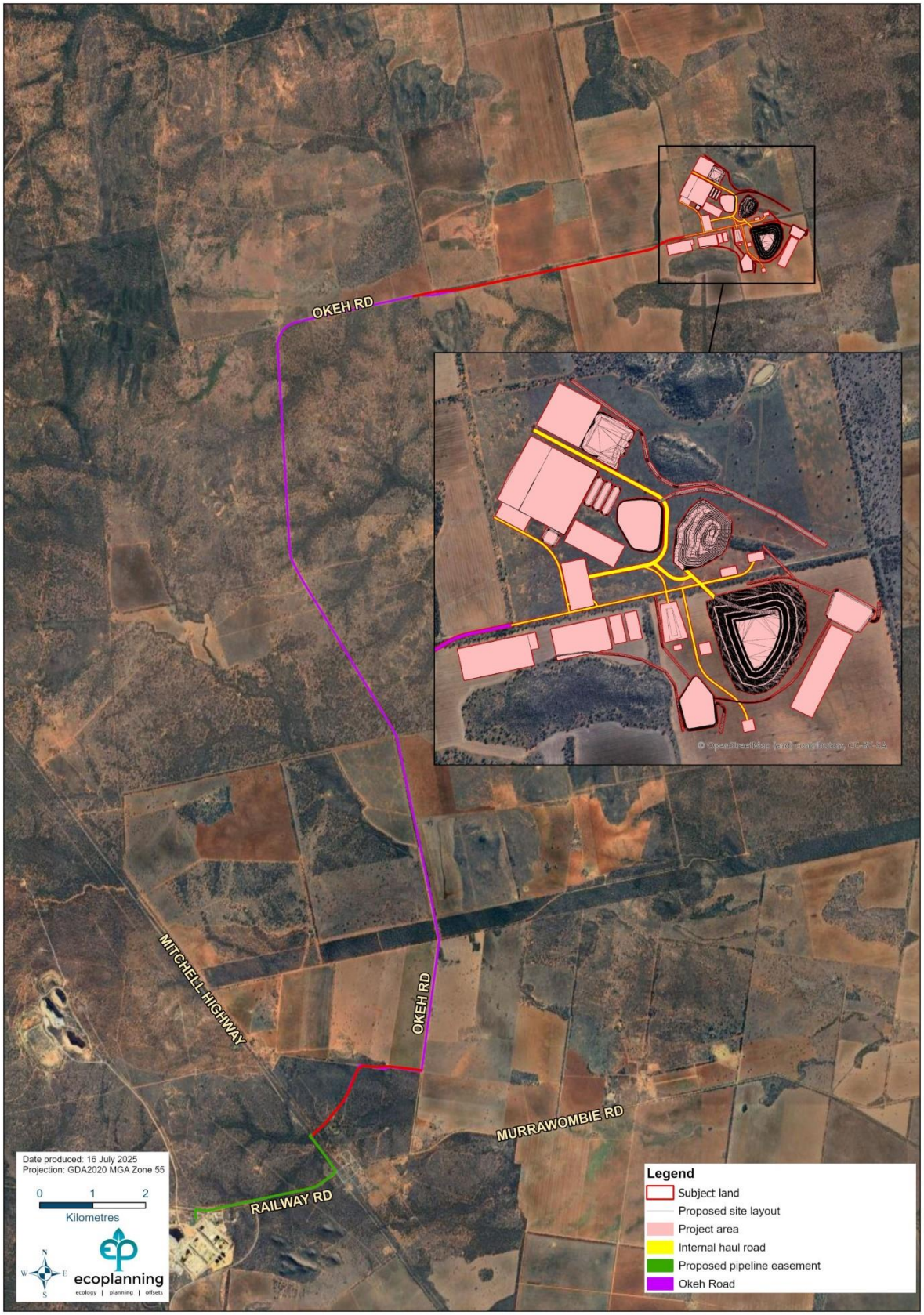


Figure 1.3: Subject land, showing Proposed Site Layout (Project area and internal haul road), and Okeh Road.

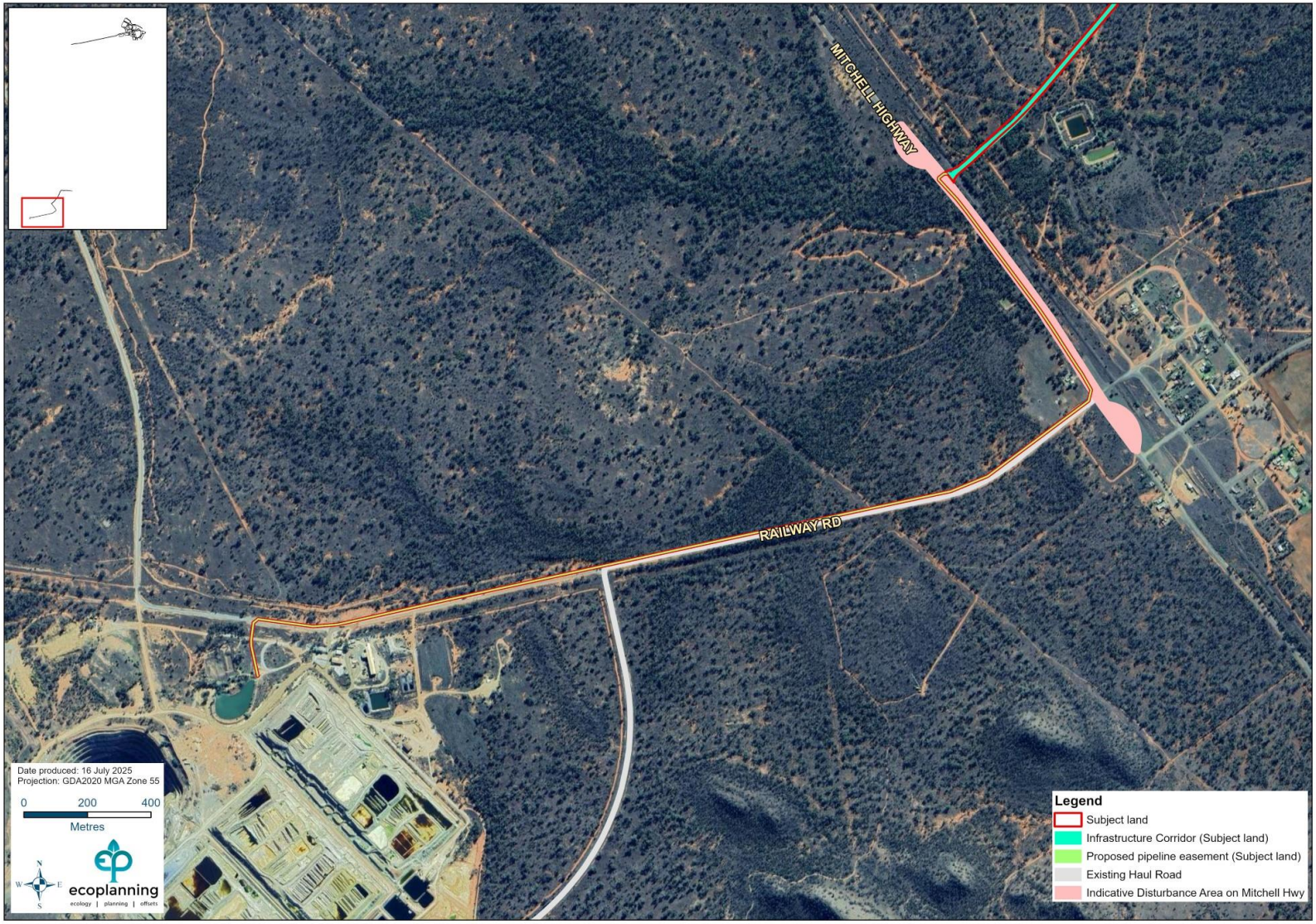


Figure 1.4: Buried pipeline to Murrawombie entrance requiring no vegetation removal.

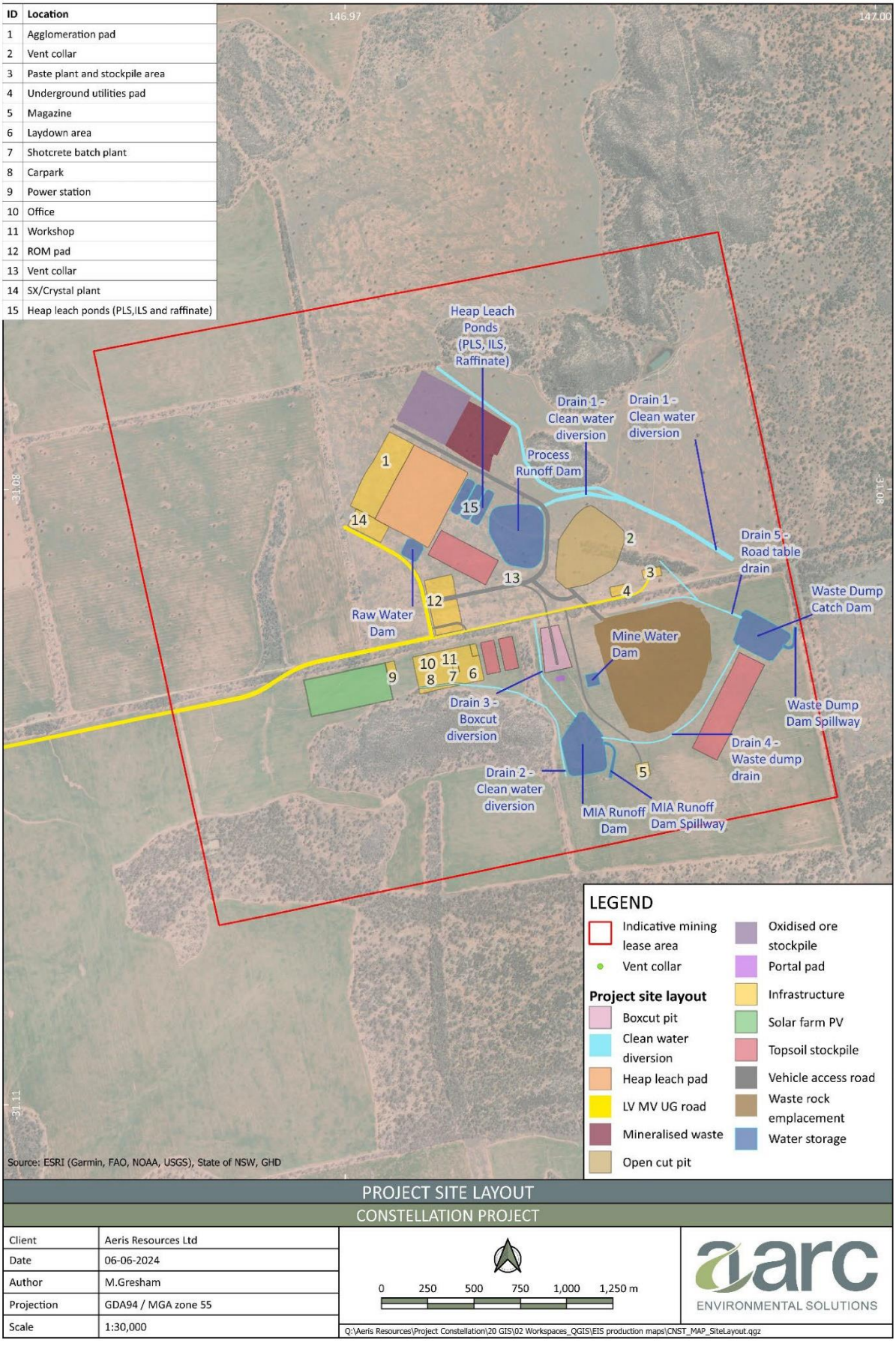


Figure 1.5: Project site layout (AARC 2024).

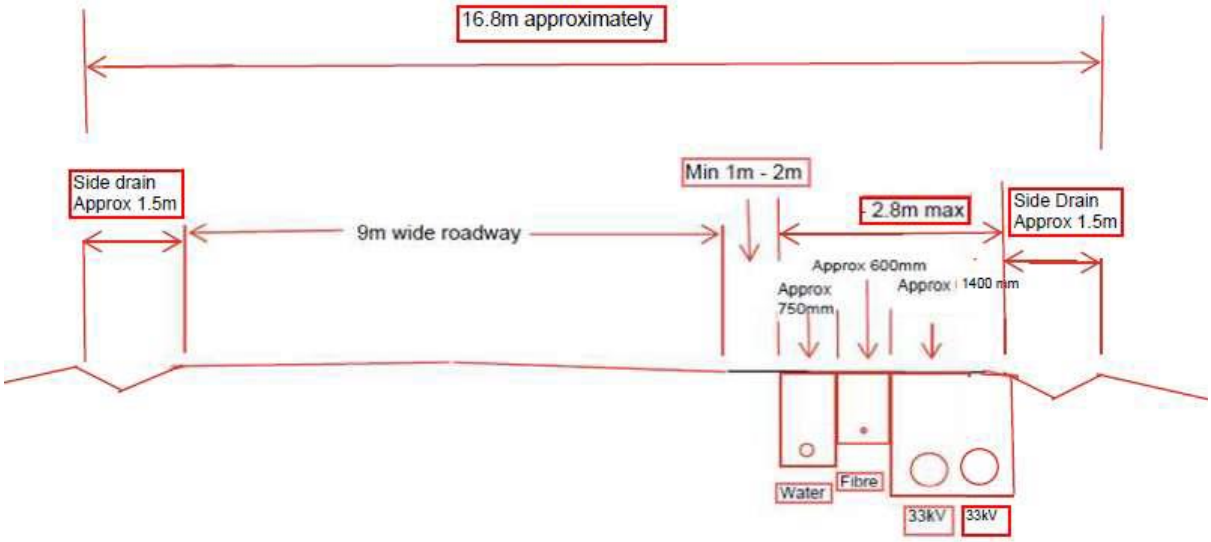


Figure 1.6: Indicative infrastructure corridor cross section.

2 Landscape context

2.1 Identifying landscape features

In accordance with Section 3.1 of the BAM, several features are assessed within the subject land and a 1,500 m assessment circle surrounding the subject land. Provided below are details related to the Interim Biogeographic Regionalisation of Australia (IBRA) (DoEE 2012) regions, its associated subregions and NSW landscapes regions (Mitchell Landscapes; DECC 2016). Other features, such as rivers, streams, estuaries, and wetlands, habitat connectivity, karst areas or areas of outstanding biodiversity value are considered, where appropriate. In accordance with Section 3.1.2 of the BAM, all relevant features are shown in **Figure 2.2** unless otherwise stated.

2.1.1 IBRA regions and subregions

IBRA regions represent a landscape-based approach to classifying the land surface, including attributes of climate, geomorphology, landform, lithology, and characteristic flora and fauna species present. The subject land is located entirely within the Conbelego Downs IBRA subregion (version 7.0) which is part of the Cobar Peneplain IBRA region (version 7.0; DoEE 2012). These attributes were entered into the BAM calculator.

2.1.2 NSW landscapes

The subject land is located largely within the 'Cobar Downs' landscape with a small portion in the 'Cobar Isolated Hills' landscape (NSW Landscapes; DECC 2002). These attributes were entered into the BAM calculator.

This NSW Landscape is located in slightly undulating plains in the Cobar Peneplain, with rounded ridges, occasional overlying sand dunes or rock outcrops, and well-defined drainage lines of varying relief up to about 10 m. Shallow gravelly loamy soils, or ferruginous clay loam is found on ridges, grading into deeper acid and neutral red earths with hardpan down slope and calcareous red earths with areas of gilgai on drainage lines. Overlying sand dunes may contain deep sands, sandy earths, and red earth soils (DECC 2002).

The subject land is mapped in the Cobar (Cz) land system (Walker 1991). The Cobar land system is an undulating peneplain with low ridges, drainage lines, and residual higher peaks. The soils in this area are mapped as Rudosols and Tenosols, which are highly permeable and low fertility Lithosols (meaning derived from weathered rock) with low water holding capacity (DPIE 2020b).

2.1.3 Other features

Rivers, streams, and estuaries

There are a number of mapped Strahler drainage order waterbodies within the subject land (OEH 2015). This mapping shows that the subject land is intercepted by one (1) unnamed 1st order stream. There are other streams within proximity to the subject land (**Figure 2.2**). All these streams are ephemeral; most of them carried water in spring 2022 but were dry in autumn 2023. GHD (2024) have identified the low potential of Groundwater Dependent Ecosystems (GDE) within the landscape. These GDE's if present are likely to be at least partly dependent on groundwater. Impacts to these GDE's are likely to be minimal (GHD 2024).

All watercourses found within the 1,500 m assessment buffer form part of the larger catchment of the Bogan River which is approximately 8 km to the east of the subject land.

A small dam is found approximately 100 m to the east of the subject land at the south end of the proposed haulage road, and another approximately 250 m to the north of the north-east corner of the subject land on a neighbouring property.

Local and important wetlands

Under the BAM, a ***Local Wetland*** is identified as an area of land that is wet by surface water or ground water, or both, for long enough periods that the plants and animals in it are adapted to, and dependant on, moist conditions for at least part of their life cycle (DPIE 2020a).

An ***Important Wetland*** is a wetland listed under the Directory of Important Wetlands of Australia (DIWA; Environment Australia 2001) or an area included under the *State Environment Planning Policy (Coastal Management 2018)*.

There are no local or important wetlands on the site, adjacent to or downstream of the site.

Habitat connectivity

At the landscape level, the subject land forms part of a large expanse of woodland that, although fragmented by clearings of agricultural land and roads and tracks, broadly forms a contiguous area of vegetation extending from the vicinity of Girilambone to the north and west for tens or hundreds of kilometres. To the south and east of the subject area, cleared agricultural lands extend about 3 km of the subject land and have generally very poor habitat connectivity with the exception of riparian corridors and occasional patches of remnant woodland.

Areas of geological significance and soil hazard features

No other landscape features, including areas of geological significance (karst, caves, crevices, cliffs, etc.) or soil hazard features have been identified within the subject land and 1,500 m assessment buffer.

Areas of outstanding biodiversity values

No areas of outstanding biodiversity value have been identified within the subject land.

2.2 Determining site context

2.2.1 Assessing native vegetation cover

In accordance with Section 3.2 and Section 4.3.2 of the BAM, native vegetation cover must be assessed for a 1,500 m assessment buffer around the subject land to assess the habitat suitability for threatened species. The extent of native vegetation on the subject land and the 1,500 m assessment buffer was mapped using vegetation mapping compiled by NSW DCCEEW (2023a) and NSW DCCEEW (2023b) (**Figure 2.1**). This was reviewed using SIX Maps NSW Imagery (LPI 2023) and field survey to improve linework where obvious changes to vegetation extent had occurred (**Figure 2.2**). However, we note that in 2025 a large area of PCT 103 DNG in the Project area was cropped.

The combined subject land and assessment buffer area totals 6,192 ha, with the area of native vegetation mapped within this being 3,496 ha. Percentage native vegetation within the subject land and assessment buffer is 56%. In accordance with section 3.2 of BAM, a native vegetation cover class of '30-70%' was entered into the BAM calculator.

2.2.2 Assessing patch size

Patch size is defined by the BAM as '*an area of native vegetation that:*

- *occurs on the development site or biodiversity stewardship site,*
- *includes native vegetation that has a gap of <100 m from the next area of native vegetation (or ≤30 m for non-woody ecosystems).*

Patch size may extend onto adjoining land that is not part of the development site or biodiversity stewardship site.'

In assessing patch size, stands of native vegetation within 100 m of other areas of native vegetation, but which are separated by hard barriers (permanent artificial structures, wide roads, etc.) have been treated as separate patches. These highly modified pre-existing breaks in vegetation connectivity would significantly alter ecological function of these areas of native vegetation such that these areas warrant recognition as separate patches.

Following section 4.3.2 of BAM, patch size is required to be assessed as one of four classes per vegetation zone mapped, being <5 ha, 5-<25 ha, 25-100 ha, or ≥100 ha. The vegetation of the subject land is contiguous with areas of vegetation surrounding the subject land to the east and west. This contiguous land adjoins remnant vegetation within the assessment buffer. As such the vegetation patch associated with the subject land has been measured as within the ≥100 patch size, and a value of 101 ha has been entered into the BAM calculator for all vegetation zones.

2.3 Weather conditions

Weather conditions on days survey were highly variable and are outlined in **Appendix H** (BOM 2022, 2023). Surveys were conducted at various times of year during periods of above and below average rainfall for the area.

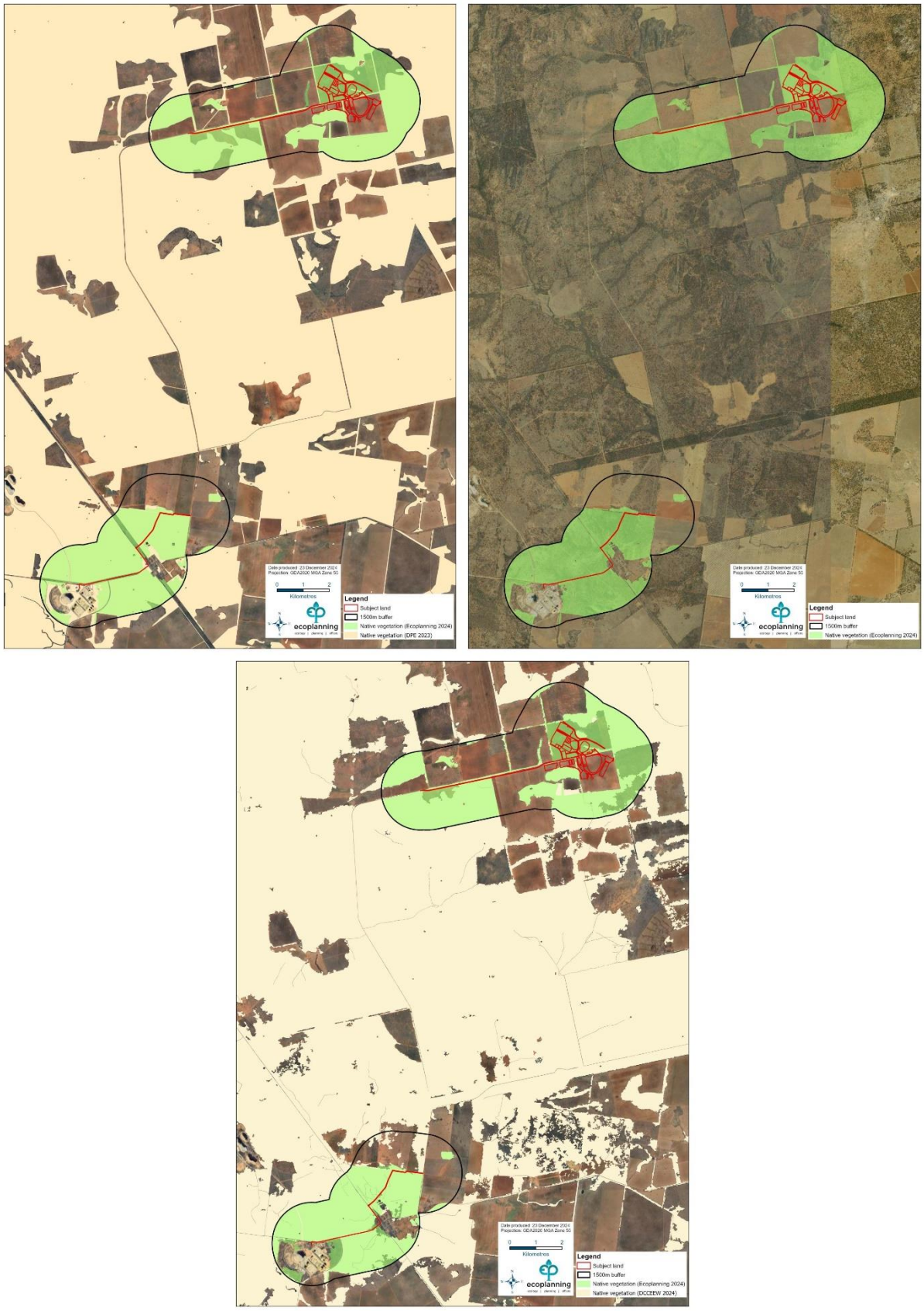


Figure 2.1: NSW Landuse map (top left), SixMaps (top right) and SVTM (bottom) were used to assess native vegetation cover. Green denotes the area validated as native vegetation (Ecoplanning 2025).

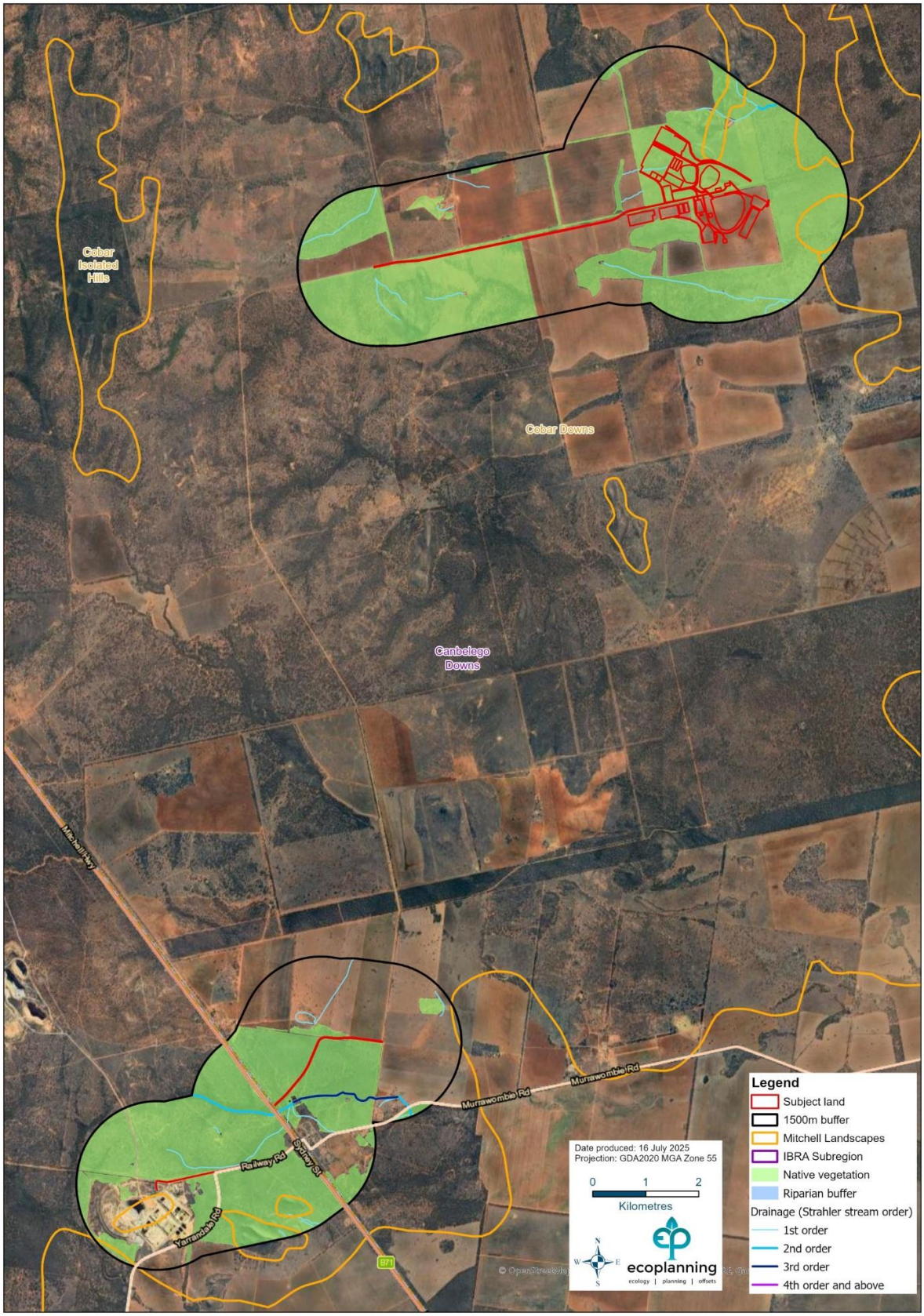


Figure 2.2: Mapped watercourses and native vegetation within a 5 km radius (Ecoplanning 2025).

3 Native vegetation

3.1 Plant Community Types (PCTs) and threatened ecological communities

3.1.1 Regional vegetation mapping

In accordance with Section 4.1 of the BAM, existing information relevant to the native vegetation of the subject land and the 1,500 m assessment buffer has been reviewed.

Desktop assessment of vegetation mapped by NSW OEH (2015) identified the following vegetation types within the subject land (**Figure 3.1**):

- PCT 72 White Cypress Pine – Poplar Box woodland on footslopes and peneplains mainly in the Cobar Peneplain Bioregion;
- PCT 98 Poplar Box – White Cypress Pine – Wilga – Ironwood shrubby woodland;
- PCT 103 Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion;
- PCT 104 Gum Coolabah woodland on sedimentary substrates mainly in the Cobar peneplain Bioregion;
- PCT 105 Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion
- PCT 250 Derived tussock grassland of the central western plains; and
- Cleared land, no vegetation, or identifiable Plant Community Type.

Regional-scale mapping of NSW Plant Community Types (NSW OEH 2015) likely to be present within the subject land, and any associated threatened ecological communities (TEC) listed under the BC Act and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), are listed in **Table 3.1**.

Table 3.1: BC Act and EPBC Act listing status of OEH mapped PCTs within the subject area and assessment buffer

PCT (DPE 2023c)	BC Act	EPBC Act
PCT 72 White Cypress Pine – Poplar Box woodland on footslopes and peneplains mainly in the Cobar Peneplain Bioregion	No	No
PCT 98 Poplar Box – White Cypress Pine – Wilga – Ironwood shrubby woodland	No	No
PCT 103 Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion	No	No
PCT 104 Gum Coolabah woodland on sedimentary substrates mainly in the Cobar peneplain Bioregion	No	No
PCT 105 Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion	No	No
PCT 250 Derived tussock grassland of the central western plains	No	No

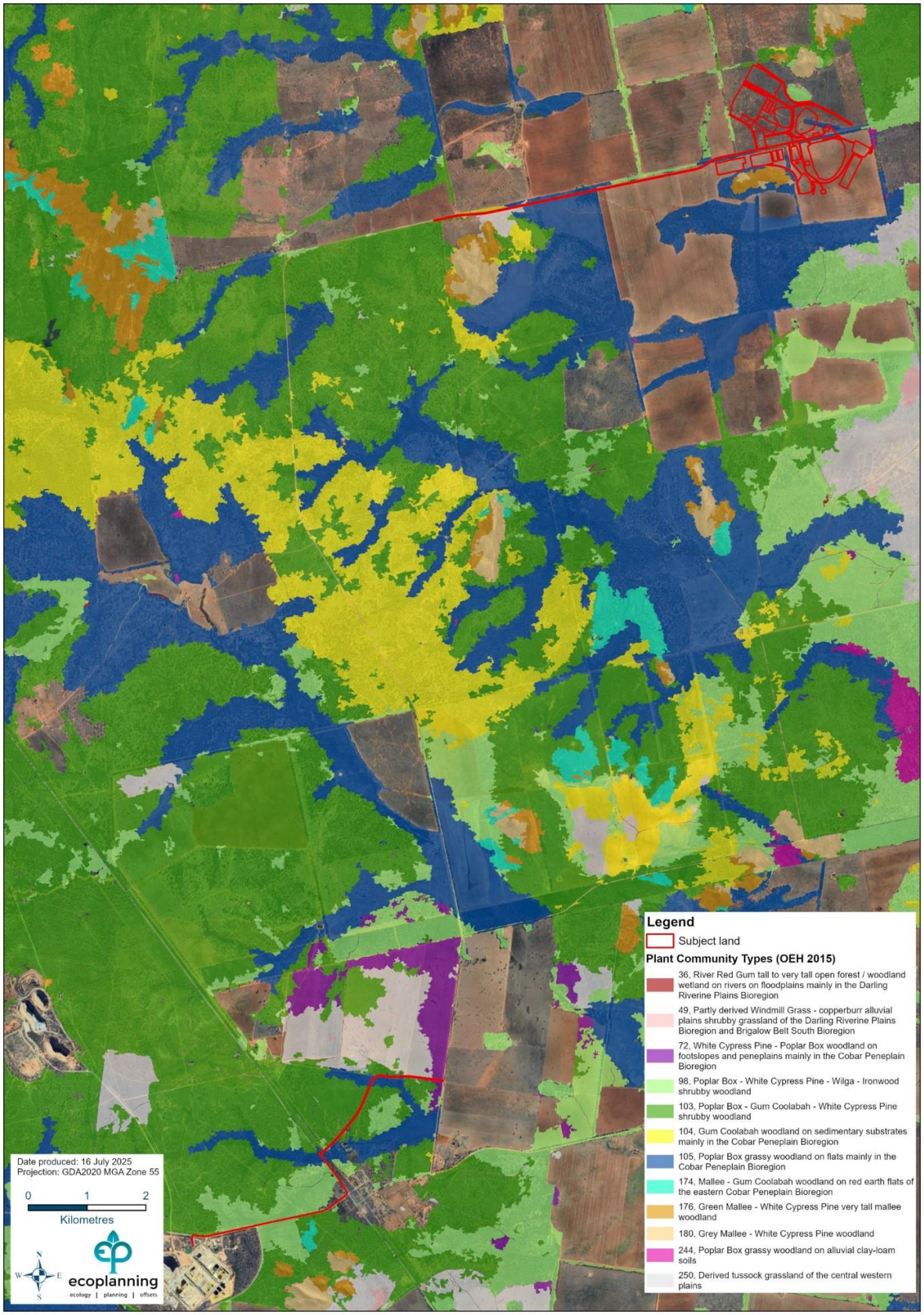


Figure 3.1: Regional vegetation community mapping (NSW OEH 2015).

3.2 Vegetation extent

3.2.1 Field assessment of vegetation communities

Assessment and validation of regionally mapped PCTs within the subject area was undertaken by Ecoplanning ecologists during ten field surveys. We note that as the Project area was reduced (to avoid impacts) while preparing the BDAR, some survey was undertaken in locations that are no longer within the subject land. Field surveys were completed during:

- 1 to 4 August 2022 by Ben Brown (Field Ecologist) and Simon Lee (Field Ecologist)
- 30 August to 2 September 2022 by Ben Brown and Simon Lee
- 4 to 7 October 2022 by Mark Robinson (Senior Ecologist) and Simon Lee
- 10 to 13 October 2022 by Bruce Mullins (Principal Ecologist) and Nicholas Agostino (Field Ecologist)
- 29 March 2023 by Bruce Mullins and Jai Brien-Cooper (Field Ecologist)
- 26 to 28 September 2023 by Mark Robinson and Nicholas Agostino
- 26 October 2023 by Elizabeth Norris (Senior Ecologist) and Ben Brown
- 20 May 2025 by Lucas McKinnon (Principal Ecologist)
- 27 May 2025 by Bruce Mullins (Principal Ecologist), Lucas McKinnon (Principal Ecologist), Elizabeth Norris (Senior Ecologist) and Declan Moylan (Field Ecologist)
- 28 May 2025 by Bruce Mullins (Principal Ecologist) and Lucas McKinnon (Principal Ecologist).

The subject land was traversed whilst recording the vegetation structure and dominant species within each structural layer, and to identify and map vegetation zones (variation in the broad condition state of vegetation polygons) in accordance with the BAM.

Based upon traverses of the subject land, the PCTs present were identified and the PCT and vegetation zone boundaries were mapped. Based on this map, areas of native vegetation on the subject land were sampled within ten (10) plot-based floristic vegetation surveys, consistent with Section 4.2.1 of the BAM (Vegetation Integrity [VI] plots). VI scores represent the degree to which the composition, structure and function of the vegetation type at a site differs from benchmark condition. Sites in benchmark condition are those sites within the contemporary landscape with higher numbers of native plant species, greater structural complexity and replete with functional components, relative to other sites within the same vegetation type and bioregion. Note that a reduction in the size of the subject land during the project meant that the VI plot for PCT 105 (Plot 33) was outside the final subject land and approximately 15 km from the nearest patch of PCT 105 that was within the subject land. Despite the PCT occurring in a consistent condition state (i.e. one vegetation zone – “intact”), benchmark data was entered into the BAM-C for this PCT rather than Plot 33. Data from Plot 33 is included in **Appendix A**, which shows that the plot was in or close to benchmark condition for most attributes.

The location of the floristic vegetation plots was based upon sampling a representative area within the community and avoided, where possible, edge effects (i.e., locations close to edges of vegetation extent) or ecotones with adjacent vegetation zones. However, given the small size and linear orientation of some of the subject land, capturing the edge of disturbed areas, such as the boundary between cropped and remnant vegetation, or locating part of the plot outside of the subject land, was unavoidable.

Flora was identified to the lowest taxonomic level possible. In many instances, flora samples lacked key diagnostic features and the lowest taxonomic level to which they were identified was genera. It is not likely that this limited the ability of the BDAR to classify vegetation into PCTs.

The identification of PCTs was in accordance with NSW PCT classification as described in the BioNet Vegetation Classification database (NSW DCCEEW 2024b). Determination of the most appropriate PCT for the vegetation community within the subject land used the BioNet Vegetation Classification database to identify/confirm PCT types which matched the geographic distribution (based on IBRA subregions), vegetation formation and floristics of vegetation within the subject land. The data for the potential PCT including vegetation formation, descriptive attributes and distribution information were then reviewed to determine the most appropriate PCT for each of the vegetation communities sampled within the subject land. Observations of vegetation structure and composition made during traverse of the subject land as well as adjacent areas also informed the determination of the most appropriate PCT for the vegetation community within the subject land. Despite some species only being able to be identified to genera, it is not likely that this has compromised the identification of PCTs.

Vegetation within the subject land was also assessed against the final determinations for TECs listed under the BC Act to determine whether the vegetation within the subject land formed part of a TEC.

Species composition should be considered in combination with other important vegetation community features, such as landscape position and soils. Some of the characteristic species listed for a PCT can be common to a number of PCTs and, therefore, species composition should not be used in isolation to determine a PCT.

3.2.2 Plant Community Types (PCTs)

Based on the floristic composition of the vegetation in the subject land, the field assessment identified two native vegetation communities within the subject land (**Table 3.2**):

- PCT 103 Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion and
- PCT 105 Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion.

Landscape position – these communities are known to occur on alluvial flats, footslopes, red sandy-loam soils and broad ridges of undulating plains (DPIE 2021b). The subject land is located in an area of flats and gently undulating plains on red-brown loam soils.

Location – Known to occur over a large section of north-central NSW, mainly in the Cobar Peneplain (DPIE 2021b). The subject land is located in the east part of the Cobar Peneplain.

Dominant canopy species and species composition:

- **PCT 103** supports open woodlands dominated in the canopy by *Eucalyptus populnea* subsp. *bimbil* together with *Eucalyptus intertexta* (Gum Coolabah) and *Callitris glaucophylla* (White Cypress Pine) typically occurring on a flat to slightly undulating landscape on red-brown loam soils which is characteristic of PCT 103.

- Shrub cover is variable, from dense to sparse, and includes *Geijera parviflora* (Wilga) and a number of *Acacia*, *Eremophila*, and *Dodonaea* spp. Density of the shrub layer appears to be influenced by soil moisture and landuse, where density is higher closer to ephemeral drainage lines. Ground cover is dominated by perennial grasses such as *Austrostipa scabra* (Speargrass), *Enteropogon acicularis* (Curly Windmill Grass) and *Chloris truncata* (Windmill Grass) together with herbs such as *Calotis lappulacea* (Yellow Burr-daisy), *Vittadinia cervicularis* and *Einadia nutans*, with *Maireana microphylla* and *Sclerolaena* sp.
- Within the subject land, *Eucalyptus populnea* subsp. *bimbil* forms the dominant canopy throughout, with *Callitris glaucophylla* present in dense stands in some places. Dieback and dead trees were evident in some patches, which may be due to the drought towards the end of the 2010's. *Eucalyptus intertexta* is found much less frequently within the subject land. The mid-stratum is dominated by open to sparse *Geijera parviflora*, with *Eremophila mitchellii* (Budda) and *Abutilon otocarpum* (Desert Lantern). Patches of *Sclerolaena* sp., *Atriplex stipitata* (Mallee Saltbush), and *Salsola australis* were also present.
- **PCT 105** is characterised by *Eucalyptus populnea* subsp. *bimbil* forming the dominant canopy species throughout, with *Callitris glaucophylla* also being present in high abundance. Stands of this PCT within the subject land were consistent with the BioNet Vegetation Classification database (DPE 2023c) of this community. The midstory is characterised by *Eremophila mitchellii* and *Geijera parviflora* in high abundance, with common understory herbs being *Calotis lappulacea*, *Goodenia glabra* and *Sida* sp. Native grasses predominately consist of *Thyridolepis mitchelliana* (Mulga Mitchell Grass), *Austrostipa scabra* and *Eragrostis brownii* (Brown's Lovegrass).

In accordance with Section 4.1 of the BAM, the extent of native vegetation was identified and mapped across the subject land (**Figure 3.2**, **Figure 3.3** and **Figure 3.4**). A total of 97.53 ha of the 184.91 ha of the subject land (52.7%) was identified as supporting native vegetation.

Condition classes of 'woodland', 'open woodland', 'intact' and 'DNG' (Derived Native Grassland) were applied to these communities.

Table 3.2: PCTs within the subject land.

Plant Community Type (PCT)	Vegetation Formation and Class	Vegetation zone	Area (ha)*
Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion (PCT 103)	Semi-arid Woodlands (Shrubby sub-formation) Western Peneplain Woodlands	Woodland	8.40
		Open woodland	1.71
		DNG	87.36
Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion (PCT 105)	Semi-arid Woodlands (Shrubby sub-formation) Western Peneplain Woodlands	Intact	0.05
Total native vegetation			**97.53**
Cleared land (No PCT)	N/A	-	87.40
Total area of the subject land			**184.91**

* Subject to rounding errors.

Poplar Box – Gum Coolabah – White Cypress Pine shrubby woodland mainly in the Cobar Peneplain bioregion (PCT 103)

Open woodland / woodland

This PCT 103 was present on the subject land in three (3) condition classes; 'Woodland', 'Open woodland' and 'Derived Native Grassland (DNG)'. PCT 103 in 'Woodland' condition was present in the southern end of the proposed vehicle track, and in the proposed mine infrastructure area. This PCT 103 is not characteristic of a TEC listed under the BC Act or EPBC Act.

The 'Woodland' condition class of this PCT was characterised as mature shrubby woodland with a dominant canopy of *Eucalyptus populnea* subsp. *bimbil*. *Callitris glaucophylla* generally forms dense variably aged stands of mostly young trees, while the shrub layer was dominated by open to sparse *Geijera parviflora* (Wilga) and *Sclerolaena birchii* (Galvanised Burr).

PCT 103 'Open woodland' condition class consists of a canopy that was similar to the more intact 'woodland' areas, but with trees more widely scattered, less evidence of regrowth, and obvious historic clearing having occurred (**Figure 3.5**). *Eucalyptus populnea* subsp. *bimbil* and *Callitris glaucophylla* were recorded widely scattered in this vegetation zone. Similarly, shrub cover was similar to the 'woodland' areas in composition but far more sparsely distributed.

The understorey was patchier in this vegetation zone, with large patches of bare earth present in many places. Species more able to colonise after disturbance such as *Calotis lappulacea, Panicum* sp., and *Medicago* sp. were more prevalent. No high threat exotic (HTE) species were recorded in these areas.

Derived Native Grassland (DNG)

The 'DNG' condition class of this community was present in the northern block of the Project's subject land where the proposed vehicle track enters the vicinity of the proposed mine infrastructure area (**Figure 3.6**). The vegetation in this area had been previously cleared, much of the landform had been heavily modified including embankments, large man-made rocky hills, and impoundments. It was characterised by a lack of canopy or mid-level apart from isolated *Sclerolaena birchii* and *Sclerolaena cuneata* individuals. Despite historic agricultural use, the understorey of this area was typically found to be dominated by native species including *Austrostipa scabra*, *Rhodanthe floribunda* (Common White Sunray), *Calotis lappulacea* and *Calotis hispidula* (Bogan Flea). The vegetation that had recolonised this area includes a mix of hardier shrubs and groundcover species characteristic of PCT 103, such as *Calotis lappulacea*, *Sclerolaena birchii, Harmsiodoxa blennodioides,* and *Medicago* sp. There was generally no canopy stratum in this vegetation zone though one *Eucalyptus intertexta* was present in BAMC-04. Whilst this area was heavily modified, the presence of native vegetation was a qualitative not quantitative measure, meaning that the presence of native species in modified areas can still register a VI score that triggers BAM condition thresholds associated with DNG. In this case VI scores for plots completed in this community averaged <20, indicating that due to historic and ongoing agricultural activity, this area has no associated credit obligations (Section 9.2.1 of the BAM DPIE 2020a).

During a site inspection in 2025, PCT103 in DNG condition in the Project area was cropped. This area appears to be in a rotational cropping regime, where it lies fallow in periods when spelled from cropping.

A summary of the PCT 103 profile from the BioNet Vegetation Classification database (DPE 2023c) is provided in **Table 3.3**. Species recorded within the subject land are highlighted in bold text.

Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion (PCT 105)

Intact

This PCT 105 was present on the subject land as one condition class and was not characteristic of a TEC listed under the BC Act or EPBC Act.

This community was present in the south portion of the proposed infrastructure corridor (**Figure 3.7**). PCT 105 was dominated almost exclusively by a canopy of *Eucalyptus populnea* subsp. *bimbil* and *Callitris glaucophylla*. Midstory species included *Geijera parviflora* and *Eremophila longifolia* which occurred in high density. The understory consisted of native grasses such as *Austrostipa scabra* in high abundance, as well as *Themeda triandra* (Kangaroo Grass), *Calotis cuneata* (Purple Burr-daisy) and *Enteropogon acicularis*.

Despite recent disturbance in this area very few invasive species were present within this condition class, with no HTE being recorded.

A summary of the PCT 105 profile from the BioNet Vegetation Classification database (DPE 2023c) is provided in **Table 3.4**. Species recorded within the subject land are highlighted in bold text.

Cleared land

Vegetation Zone 4 – cleared land

The southern extent of the Project area within the subject land consisted of previously cleared agricultural lands that are subject to seasonal cropping rotations and non-native vegetation as shown in (**Figure 3.8**). This zone was confirmed from NSW Landuse V1.5 mapping (NSW DCCEEW 2023b), SVTM (NSW DCCEEW 2023a), historic aerial imagery (taken in 2012, 2015 and 2023) and field survey that clearly show historic and current plough lines from cropping practices through the area.

Given the vegetation that represents this zone was not mapped as native vegetation, was seen in aerial imagery taken in 2012, 2015 and 2023 to be cropped, and observed in the field to be cropped, the vegetation in this zone no longer represents native vegetation and is mapped as cleared land. Therefore, in accordance with Section 4.1.2 of the BAM (DPIE 2020a), this vegetation was not assessed further.



Figure 3.2: Field validated PCTs within the subject land and plot locations (Project area) (Ecoplanning 2025).



Figure 3.3: Field validated PCTs within the subject land and plot locations (northern extent) (Ecoplanning 2025).

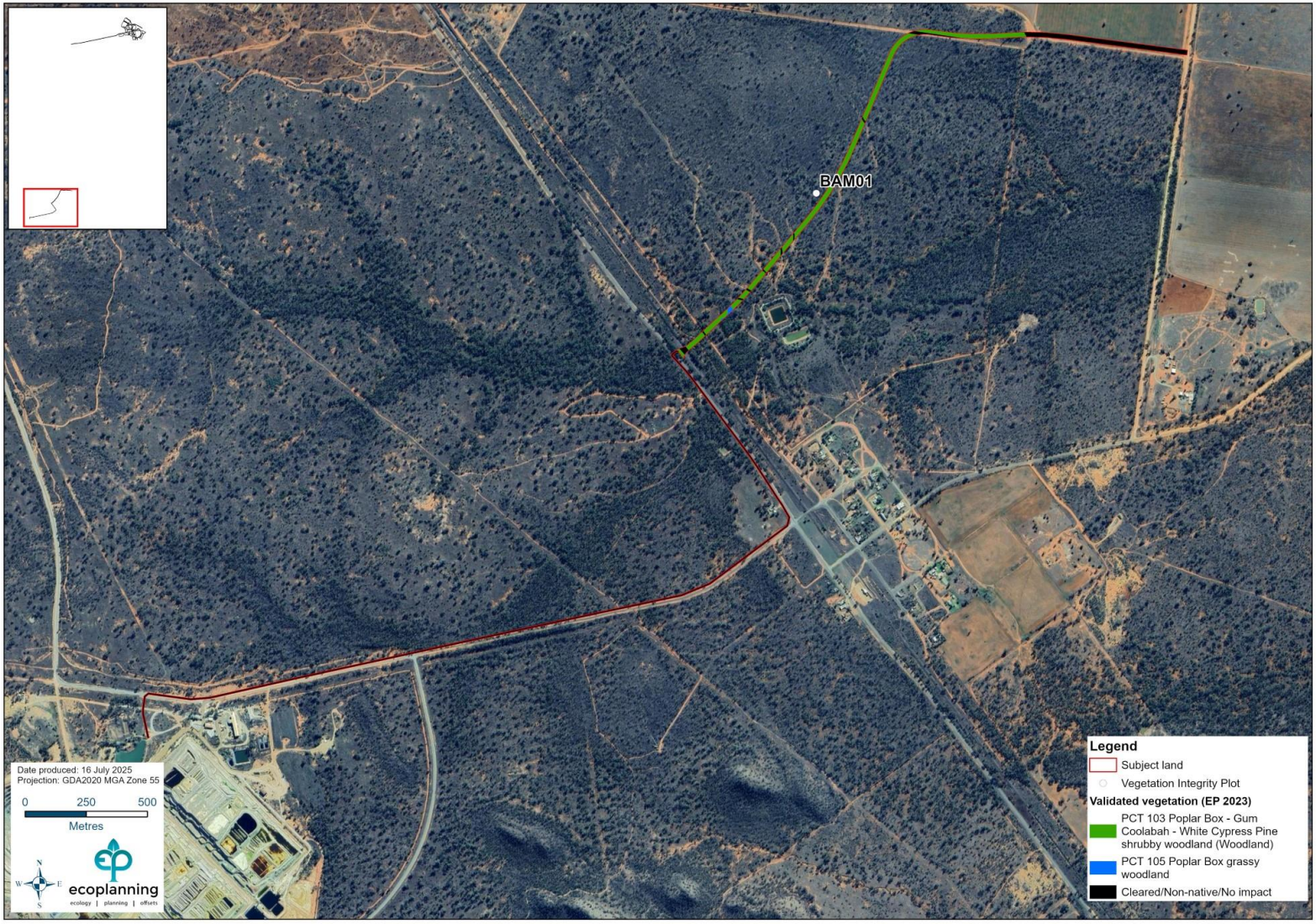


Figure 3.4: Field validated PCTs within the subject land and plot locations (southern extent) (Ecoplanning 2025).



Figure 3.5: PCT 103 vegetation in 'open woodland' condition class Derived Native Grassland.



Figure 3.6: Derived Native Grassland.



Figure 3.7: PCT 105 vegetation 'intact' condition class (note that this plot is not located in the final subject land).



Figure 3.8: Cropping observed on south side of Project area (subject land) is classified as cleared land.



Figure 3.9: Example of a hollow bearing tree.

Table 3.3: PCT profile (NSW DCCEEW 2024b) - Poplar Box – Gum Coolabah – White Cypress Pine shrubby woodland mainly in the Cobar Peneplain bioregion (PCT 103). Species found within the subject land are in bold.

PCT	Poplar Box – Gum Coolabah – White Cypress Pine shrubby woodland mainly in the Cobar Peneplain bioregion
PCT ID	PCT 103
Vegetation formation	Semi-arid Woodlands (Shrubby sub-formation)
Vegetation class	Western Peneplain Woodlands
Upper stratum	***Eucalyptus populnea* subsp. *bimbil***; ***Callitris glaucophylla***; ***Eucalyptus intertexta***; *Casuarina cristata; Acacia excelsa* subsp. *angusta; Atalaya hemiglauca; Grevillea striata;* ***Brachychiton populneus* subsp. *populneus***; *Alectryon oleifolius* subsp. *canescens*
Middle stratum	***Geijera parviflora***; ***Eremophila mitchellii***; *Eremophila glabra; Acacia deanei* subsp. *paucijuga; Dodonaea viscosa* subsp. *angustissima; Dodonaea viscosa* subsp. *spatulata; Bertya cunninghamii; Dodonaea viscosa* subsp. *cuneata;* ***Apophyllum anomalum***; *Rhagodia spinescens; Acacia aneura;* ***Eremophila sturtii; Senna form taxon 'artemisioides'***; ***Eremophila longifolia***; *Hakea tephrosperma;* ***Pimelea microcephala* subsp. *microcephala***; *Beyeria viscosa; Acacia tetragonophylla; Acacia homalophylla; Amyema quandang* var. *quandang*
Ground stratum	*Maireana microphylla;* ***Enteropogon acicularis***; ***Sclerolaena birchii***; ***Austrostipa scabra* subsp. *scabra***; ***Sclerolaena diacantha***; ***Einadia nutans subsp. nutans***; *Einadia nutans* subsp. *linifolia;* ***Aristida jerichoensis* var. *subspinulifera***; ***Thyridolepis mitchelliana; Monachather paradoxus***; ***Chloris truncata***; ***Eragrostis lacunaria***; *Vittadinia cervicularis* var. *cervicularis;* ***Calotis lappulacea***; *Vittadinia cuneata* var. *hirsuta;* ***Sida corrugata***; *Ptilotus atriplicifolius* var. *atriplicifolius*[1]; *Cheilanthes austrotenuifolia; Oxalis chnoodes;* ***Boerhavia dominii***; ***Solanum ferocissimum***; *Ptilotus obovatus* var. *obovatus; Chrysocephalum semipapposum;* ***Xerochrysum bracteatum***; ***Chenopodium desertorum* subsp. *desertorum***; *Solanum coactiliferum*
Landscape position	Alluvial flats, footslopes and broad ridges of undulating plains. Occurs on clay loam, sandy loam or lateritic soils. Occurs mainly in the Cobar Peneplain Bioregion of central-western NSW with annual rainfall 350 - 450 mm.
Profile source	Benson 103 (Benson et al. 2006)
Full reference details	Westbrooke, M. et al. (2004); Thompson, D.F. (1982); Porteners, M.F. (1993); Ritman, K. (1995); Pickard, J. and Norris, E.H. (1994); Dick, R. (1999); Sivertsen, D. and Metcalfe, L. (2001); Porteners, M.F. (2001a); Porteners, M.F. (2003b); Metcalfe, L., Sivertsen, D.P., Tindall, D.R. and Ryan, K.M. (2003); Brickhill, J. (1978b); Beeston, G.R., Walker, P.J., Purdie, R. and Pickard, J. (1980); DEC (2006a); DEC (2006b); Lewer, S., Ismay, K., Grounds, S., Gibson, R., Harris, M., Armstrong, R., Deluca, S. and Ryan, C. (2003); Masters, P. and Foster, E. (2000)
Estimate remaining pre-European extent rounded to nearest 5%	50%
TEC Name (NSW BC Act, EPBC Act Listing status)	NA

Species present within subject land are denoted in bold

Table 3.4: PCT profile (NSW DCCEEW 2024b) – Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion (PCT 105). Species found within the subject land are in bold.

PCT	Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion
PCT ID	PCT 105
Vegetation formation	Semi-arid Woodlands (Shrubby sub-formation)
Vegetation class	Western Peneplain Woodlands
Upper stratum	***Eucalyptus populnea* subsp. *bimbil*; *Callitris glaucophylla*; *Alectryon oleifolius* subsp. *canescens*; *Brachychiton populneus* subsp. *populneus*;** *Eucalyptus largiflorens*
Middle stratum	*Acacia aneura; Acacia colletioides; Eremophila glabra;* ***Geijera parviflora;*** *Bursaria spinosa;* ***Eremophila mitchellii; Myoporum montanum;*** *Acacia oswaldii; Capparis mitchellii; Hakea tephrosperma; Acacia decora; Apophyllum anomalum*
Ground stratum	***Einadia nutans;*** *Maireana microphylla;* ***Aristida behriana****; Enneapogon avenaceus; Enneapogon polyphyllus;* ***Austrostipa scabra* subsp. *scabra*; *Calotis cuneifolia*; *Sclerolaena birchii*;** *Austrodanthonia setacea; Eragrostis megalosperma; Solanum quadriloculatum; Stackhousia viminea; Wahlenbergia luteola; Erodium crinitum;* ***Sclerolaena convexula;*** *Plantago turrifera;* ***Harmsiodoxa blennodioides***
Landscape position	On peneplain and plain landforms mainly in the Cobar Peneplain Bioregion.
Profile source	Benson 105 (Benson et al. 2006)
Full reference details	Pickard, J. and Norris, E.H. (1994) The natural vegetation of north-western New South Wales: notes to accompany the 1:1 000 000 vegetation map sheet. Cunninghamia 3(3): 423-464; Dick, R. (1999) Vegetation map of Gundabooka NP, Unpublished map. (NSW National Parks and Wildlife Service: Hurstville); Sivertsen, D. and Metcalfe, L. (2001) Northern wheatbelt vegetation mapping. Unpublished 1:250 000 scale vegetation maps and vegetation descriptions covering northern NSW wheatbelt. (NSW National Parks and Wildlife Service: Hurstville); Metcalfe, L., Sivertsen, D.P., Tindall, D.R. and Ryan, K.M. (2003) Natural vegetation of the New South Wales wheatbelt (Cobar-Nyngan-Gilgandra-Nymagee-Narromine-Dubbo 1:250 000 vegetation sheets). Cunninghamia 8(2) 252-284; Cohn, J.S. (1995) The vegetation of Nombinnie and Round Hill Nature Reserves, central-western New South Wales. Cunninghamia 4(1): 81-101; Parker, B.S., Thackway, R.M. and Menzies, W.J. (1979) An introduction to Yathong Nature Reserve. Unpublished report. (CSIRO Division of Wildlife and Research: Canberra); DEC (2006b) Reconstructed and extant distribution of native vegetation in the Central West Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo); DEC (2006a) Reconstructed and extant distribution of native vegetation in the Lachlan Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo); Lewer, S., Ismay, K., Grounds, S., Gibson, R., Harris, M., Armstrong, R., Deluca, S. and Ryan, C. (2003) Native vegetation map report Bogan Gate, Boona Mount, Condobolin, Dandaloo, Tottenham and Tullamore 1:100 000 map sheets. (NSW Department of Infrastructure, Planning and Natural Resources). Submitted to Cunninghamia; Bedward, M., Sivertsen, D.P., Metcalfe, L.M., Cox, S.J. and Simpson, C.S. (2001) Monitoring the rate of native woody vegetation change in the New South Wales wheatbelt. Natural Heritage Trust report. (NSW National Parks and Wildlife Service: Hurstville); Sivertsen, D. and Metcalfe, L. (1995) Natural vegetation of the southern wheat-belt (Forbes and Cargelligo 1:250 000 map

	sheets). Cunninghamia 4(1): 103-128; Dykes, P. (2002) Vegetation communities of the Cobar Shire. Unpublished report. (Department of Land and Water Conservation, Far West Region: Dubbo); Masters, P. and Foster, E. (2000) Investigating fauna distribution on the Cobar Peneplain. Report to the NSW National Parks and Wildlife Service: Hurstville;
Estimate remaining pre-European extent rounded to nearest 5%	55%
TEC Name (NSW BC Act, EPBC Act Listing status)	NA

Species present within subject land are denoted in bold

3.2.3 Threatened Ecological Communities

No Threatened Ecological Communities (TEC) listed under the BC Act or the EPBC Act were found within the subject area.

3.3 Vegetation zones

3.3.1 Vegetation integrity (VI) survey plots

Nine (9) VI plots were completed in PCT 103, and one (1) VI plot (Plot 33) was completed in PCT 105 (**Appendix A**). However, with changes to the subject land that reduced the overall footprint, the VI plot sampled for PCT 105 was well away (approximately 15 km) from the small patch that remained in the subject land. As a consequence, benchmark data was used in the BAM-C for this PCT instead of data from Plot 33.

The number of VI plots surveyed was consistent with the requirements as outlined within Table 3 of the BAM (**Table 3.5**). Community condition benchmarks for each PCT present within the subject land are outlined in (NSW DCCEEW 2024b). Growth form groups and condition attributes outlined in Section 4.3.3 Table of the BAM (DPIE 2020a) were cross-checked against each of these benchmark values. Given the small size of each vegetation zone and linear orientation of much of the subject land along the proposed infrastructure corridor, plots were orientated as best as possible to capture the most representative parts of each zone and to avoid ecotones, zone boundaries and disturbances such as tracks. Further, as the width of the proposed infrastructure corridor is narrow and includes part of the existing Okeh Road, some plots were not wholly within the subject land. Ten (10) standard 20 x 50 m VI plots were completed as shown in **Table 3.5**. **Figure 3.10**, **Figure 3.11** and **Figure 3.12** show the locations of each VI plot.

Table 3.5: Number of VI plots required for each vegetation zone base on their respective sizes.

PCT name	Vegetation Zone	Area (Operational footprint)	Area (Infrastructure Corridor)	Number of plots completed
PCT 103 Poplar Box – Gum Coolabah – White Cypress Pine shrubby woodland mainly in the Cobar Peneplain bioregion.	Woodland	2.78 ha	5.61 ha	3 (BAM-C-01, BAM-C-07, BAM-01) (**Figure 3.10** and **Figure 3.12**)
	Open woodland		1.71 ha	1 (BAM-02) (**Figure 3.11**)
	DNG	78.27 ha	9.09 ha	5 (BAM-C-03, BAM-C-04, BAM-C-05, BAM-C-06, BAM-30) (**Figure 3.10** and **Figure 3.11**)
PCT 105 Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion	Intact	-	0.05 ha	Benchmark data applied (1 plot [BAM33] completed outside subject land)

3.3.2 Current and future vegetation integrity scores

VI scores were calculated based on the VI plot data collected within the subject land for PCT 103 and benchmark data for PCT 105. Data collected for the VI plot is included in **Appendix A**. The VI score for the vegetation zones is provided in **Table 3.6**.

It has been assumed that all vegetation within the subject land will be completely cleared. As such, the future VI scores were given a value of 0 / 100 for all vegetation zones (**Table 3.6**).

Table 3.6: Vegetation Integrity scores.

PCT	Vegetation Zone	Vegetation Integrity score	
		Before development	After development
Poplar Box – Gum Coolabah – White Cypress Pine shrubby woodland (PCT 103)	Woodland	64.5	0
	Open woodland	48.6	0
	DNG	16	0
Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion (PCT 105)	Intact	100*	0

* note that benchmark condition data was entered into the BAM-C for PCT 105.

3.4 Hollow bearing trees

Section 4.3.4 of the BAM '*assess the presence of hollow bearing trees'* 8 – 12 requires that the assessor assess hollow bearing trees within each vegetation zone. The location of HBT's within the subject site and those within the study area are shown in **Figure 3.13**, **Figure 3.14** and **Figure 3.15**, some of which were within VI plots (see **Appendix A**). The survey counted and mapped the hollow bearing trees (HBT) along the proposed infrastructure corridor and the Project area (subject land) and within 10m of the subject land (**Table 3.7**).

Section 4.3.4 (11) of the BAM states that '*where hollow bearing trees are present within a vegetation zone, the assessor must include a hollow bearing tree in at least one plot for that zone*'. Two VI plots within PCT 103 'Woodland' vegetation zone were each allocated one HBT (BAM-C-02 and BAM-C-07). For PCT 105 HBTs are not an attribute in benchmark data.

Table 3.7: Number of hollow bearing trees identified within the subject land organised by Constellation Project site and proposed infrastructure corridor.

Location	No. of hollow bearing trees
Operational Area (Constellation)	1
Proposed infrastructure corridor	30
Outside of proposed infrastructure corridor (within 10 m)	17
Total hollow bearing trees	**48**

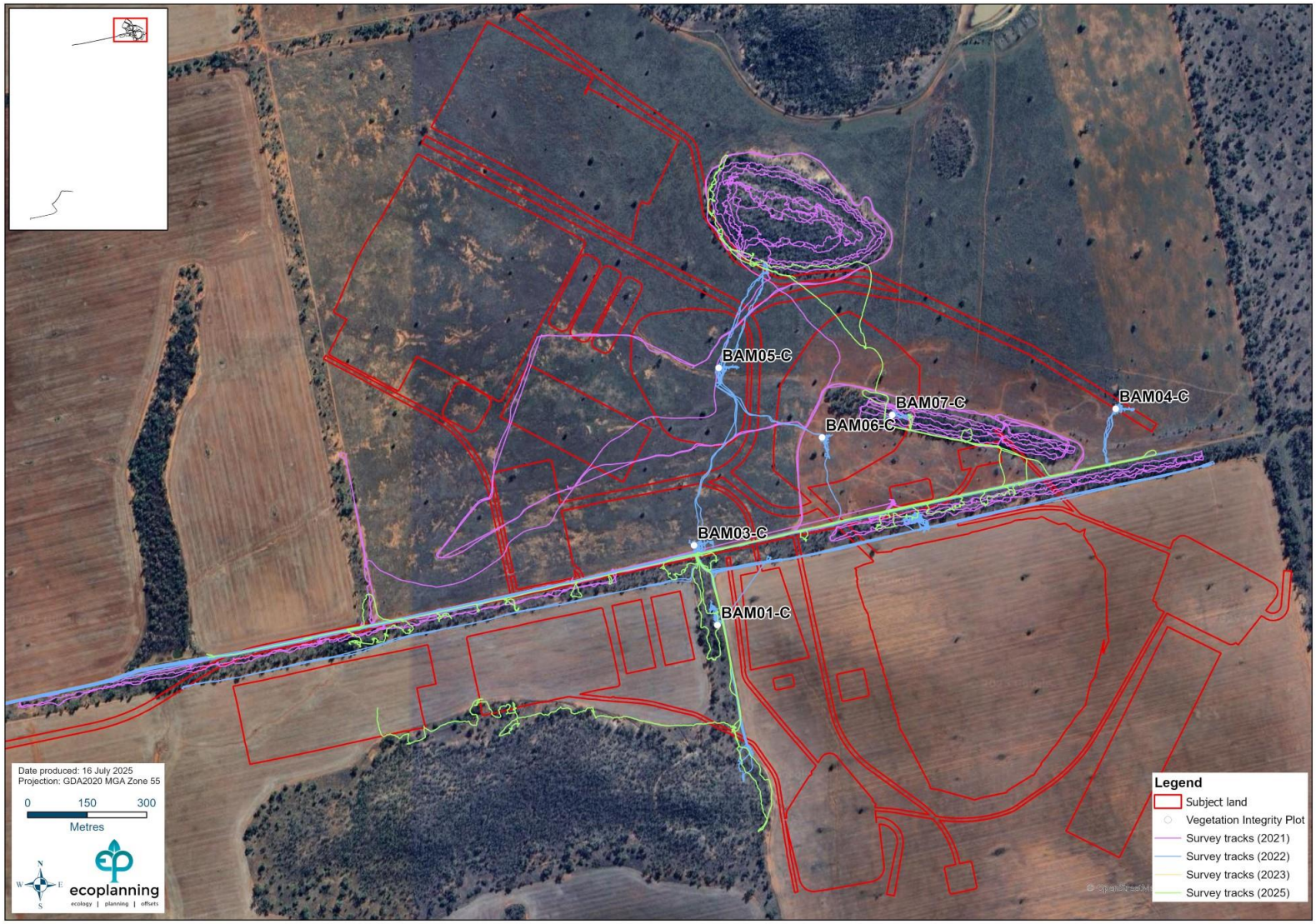


Figure 3.10: Threatened flora survey effort, HBT survey tracks and VI plot locations (Project area) (Ecoplanning 2025).

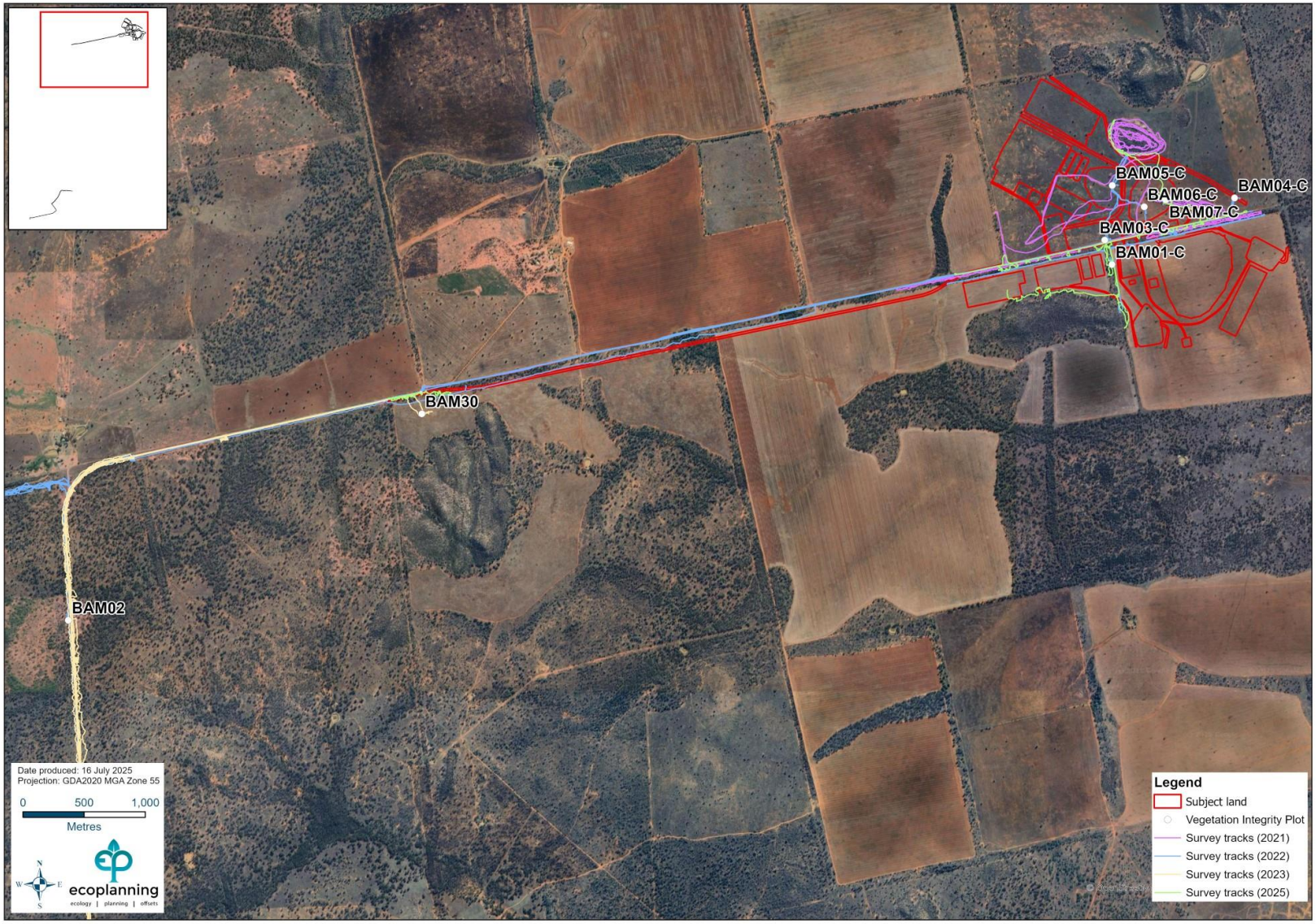


Figure 3.11: Threatened flora survey effort, HBT survey tracks and VI plot locations (northern infrastructure corridor) (Ecoplanning 2025).

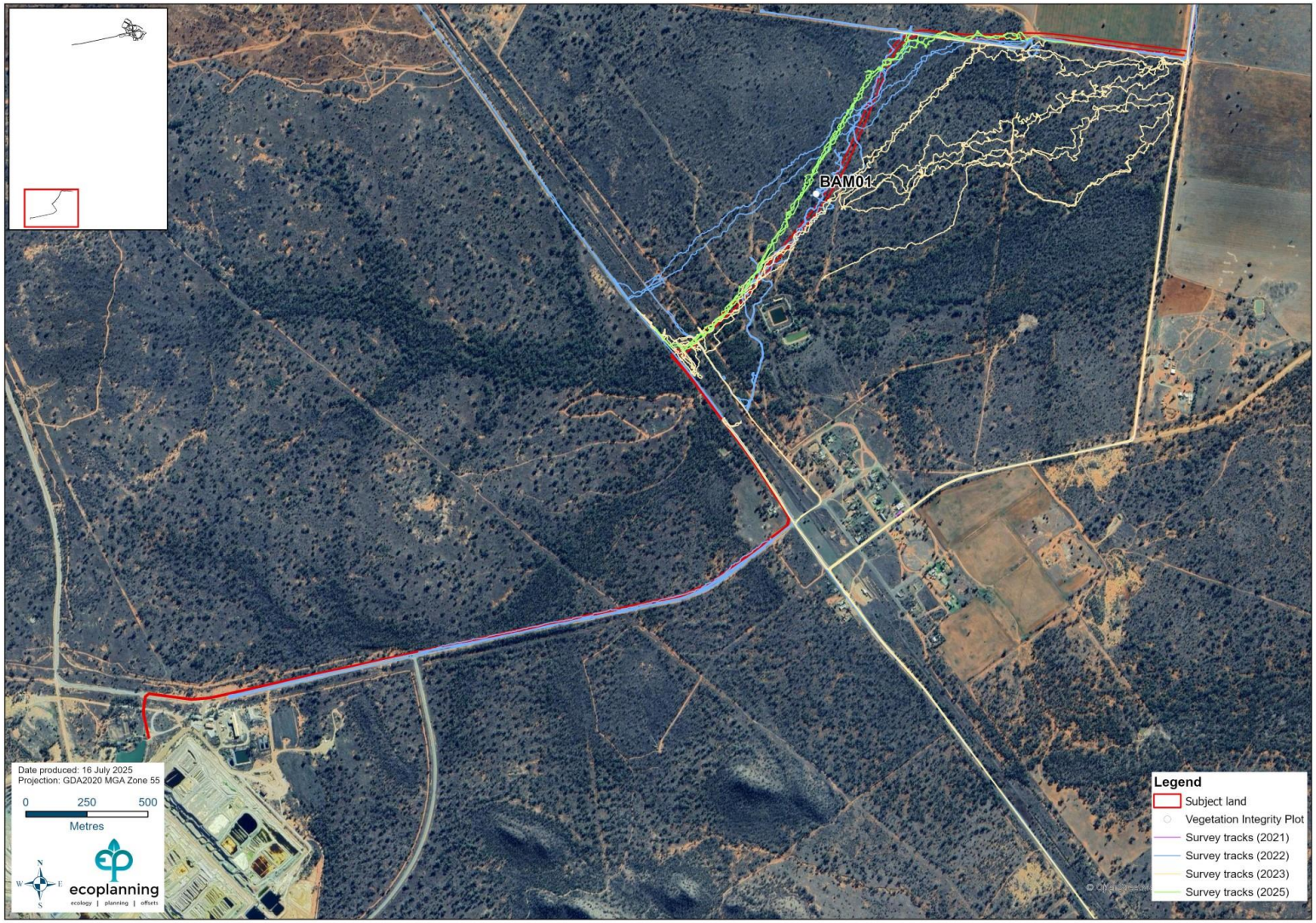


Figure 3.12: Threatened flora survey effort, HBT survey tracks and VI plot locations (southern extent) (Ecoplanning 2025).

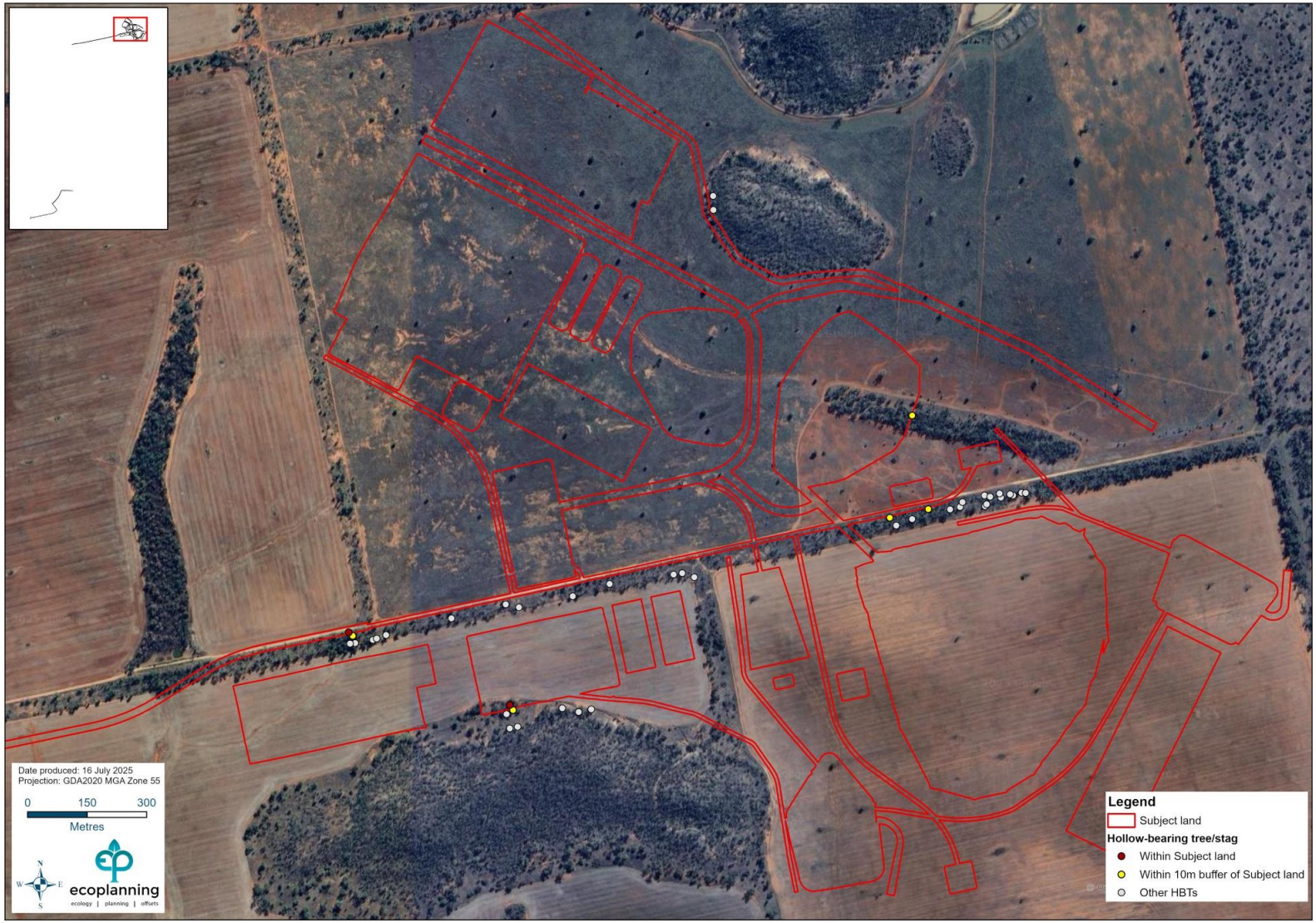


Figure 3.13: Location of hollow-bearing trees (Project area) (Ecoplanning 2025).



Figure 3.14: Location of hollow-bearing trees (northern infrastructure corridor) (Ecoplanning 2025).

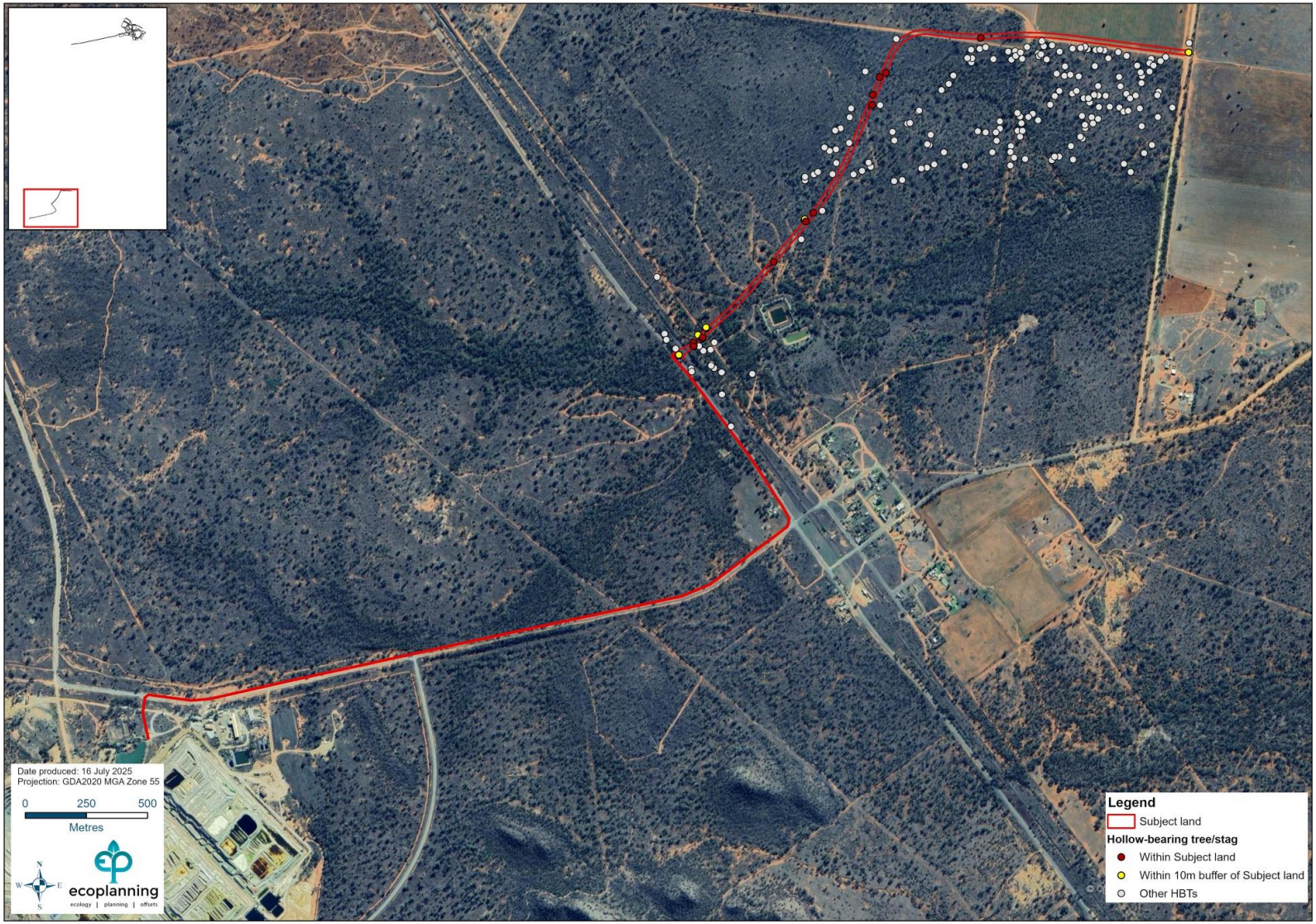


Figure 3.15: Location of hollow-bearing trees (southern infrastructure corridor) (Ecoplanning 2025).

4 Threatened species

Section 5 of the BAM details the process for determining the habitat suitability for threatened species.

Under the BAM, threatened species are separated into two classes, 'ecosystem' and 'species' credit species. Those threatened species where the likelihood of occurrence of a species or elements of the species' habitat can be predicted by vegetation surrogates and landscape features, or which a targeted survey has a low probability of detection, are identified as 'ecosystem' credit species. Targeted surveys are not required for ecosystem species and potential impacts to these species are assessed in conjunction with impacts to PCTs.

Threatened species where the likelihood of occurrence of a species or elements of suitable habitat for the species cannot be confidently predicted by vegetation surrogates and landscape features and can be reliably detected by survey are identifiable as species credit species. A targeted survey or an expert report is required to confirm the presence or absence of these species on the subject land.

For some threatened species, they are identifiable as both ecosystem and species credit species, with different aspects of the habitat and life cycle representing different credit types. Commonly, threatened fauna species' foraging habitat is an ecosystem credit, while their breeding habitat represents a species credit.

Four threatened species were opportunistically observed within the study area, being Pink Cockatoo (*Lophochroa leadbeateri*), Spotted Harrier (*Circus assimilis*), Southern Whiteface (*Aphelocephala leucopsis leucopsis*) and Grey-crowned Babbler (*Pomatostomus temporalis temporalis*). Only Pink Cockatoo is a candidate species credit species for PCTs found within the study area. As such there is no set survey requirements or survey period for Spotted Harrier, Southern Whiteface or Grey-crowned Babbler associated with this project. Impacts to these species are likely to be negligible. A small amount of foraging habitat for these species will be impacted by the proposed works.

Note that the Southern Whiteface was recently listed and at the time this BDAR was prepared, the Threatened Biodiversity Data Collection (TBDC) had not identified whether the species was an ecosystem credit species or a species credit species, or the PCTs that the species is associated with. It is assumed for the purpose of this BDAR that it is an ecosystem credit species, and has been included in our discussion in **Section 4.1.3**.

The following sections outline the process for determining the habitat suitability for threatened species within the subject land, and the results of the targeted surveys for candidate threatened species.

4.1.1 Threatened species for assessment

Threatened species that require assessment are initially identified based upon the following criteria:

- the distribution of the species including the IBRA subregion in which the subject land occurs (Conbelego Downs IBRA subregion);
- the species is associated with any of the PCTs identified within the subject land;

- the native vegetation cover within the assessment area including the 1,500 m assessment buffer around the subject land and is equal to or greater than the minimum required for the species;
- the patch size that each vegetation zone is part of is equal to or greater than the minimum required for that species; and
- the species is identified as an ecosystem or species credit species in the Threatened Biodiversity Data Collection.

The process for identifying threatened species that meet the above criteria is completed through the BAM calculator. The PCTs identified within the subject land, patch size, and native vegetation cover, as outlined in Section 3 of BAM, were entered into the BAM calculator and a preliminary list of ecosystem and species credit species was tabulated.

4.1.2 Geographic and habitat features

Selected ecosystem credit species and candidate species credit species are predicted following assessment of geographic and habitat features in the credit calculator, such as site location (IBRA subregion), PCTs and their condition, patch size, and area of vegetation within the assessment circle. Some species require further assessment of habitat constraints and/or geographic limitations before being confirmed as an ecosystem credit species or candidate species for assessment.

4.1.3 Ecosystem credit species

Twenty-three (23) ecosystem credit species were predicted to occur within the subject land. Twenty (20) have been retained based on habitat constraints, and Southern Whiteface has been added to the table. The biodiversity risk weighting for each ecosystem credit species (**Table 4.1**) is based on the sensitivity to gain, as per the criteria in Appendix I of the BAM (DPIE 2020a). Southern Whiteface is a recently listed species and has been recorded on site. The ecosystem species retained for the subject land are listed in **Table 4.1**.

Table 4.1: Assessment of habitat constraints and geographic limitations of ecosystem credit species.

Scientific name / Common name	Habitat constraints	Geographic limitations	Sensitivity to gain class	Maintained as an Ecosystem Credit Species	Status	
					BC Act	EPBC Act
Antechinomys laniger Kultarr	-	-	High	Yes	E	-
Aphelocephala leucopsis leucopsis Southern Whiteface		-	-	Yes	V	V
Artamus cyanopterus cyanopterus Dusky Woodswallow	-	-	Moderate	Yes	V	-

Scientific name / Common name	Habitat constraints	Geographic limitations	Sensitivity to gain class	Maintained as an Ecosystem Credit Species	Status	
					BC Act	EPBC Act
Calyptorhynchus lathami South-eastern Glossy Black-Cockatoo (foraging)	Presence of *Allocasuarina* and *Casuarina* species	-	High	No – *Casuarina* not present	V	V
Certhionyx variegatus Pied Honeyeater	-	-	Moderate	Yes	V	-
Chalinolobus picatus Little Pied Bat	-	-	High	Yes	V	-
Chthonicola sagittata Speckled Warbler	-	East and south of Cobar	High	Yes	V	-
Circus assimilis Spotted Harrier	-	-	Moderate	Yes	V	-
Daphoenositta chrysoptera Varied Sittella	-	-	Moderate	Yes	V	-
Falco hypoleucos Grey Falcon	-	-	Moderate	Yes	V	V
Falco subniger Black Falcon	-	-	Moderate	Yes	V	-
Grantiella picta Painted Honeyeater	Mistletoes present at a density of greater than five mistletoes per hectare	-	Moderate	No	V	V
Haliaeetus leucogaster White-bellied Sea-Eagle (foraging)	Within 1 km of a river, lake, large dam or creek, wetlands, and coastlines	-	High	No	V	-
Hamirostra melanosternon Black-breastedBuzzard (foraging)	-	-	Moderate	Yes	V	-
Hieraaetus morphnoides Little Eagle (foraging)	-	-	Moderate	Yes	V	-

Scientific name / Common name	Habitat constraints	Geographic limitations	Sensitivity to gain class	Maintained as an Ecosystem Credit Species	Status	
					BC Act	EPBC Act
Lophochroa leadbeateri Pink Cockatoo (foraging)	-	-	Moderate	Yes	V	E
Lophoictinia isura Square-tailed Kite (foraging)	-	-	Moderate	Yes	V	-
Melanodryas cucullata cucullata Hooded Robin (south-eastern form)	-	-	Moderate	Yes	E	E
Polytelis swainsonii Superb Parrot	-	-	Moderate	Yes	V	V
Pomatostomus temporalis temporalis Grey-crowned Babbler (eastern subspecies)	-	-	Moderate	Yes	V	-
Saccolaimus flaviventris Yellow-bellied Sheathtail-bat	-	-	High	Yes	V	-
Sminthopsis macroura Striped-faced Dunnart	-	-	High	Yes	V	-
Stagonopleura guttata Diamond Firetail	-	-	Moderate	Yes	V	V

4.1.4 Candidate species credit species

In accordance with Section 5.2.2 and 5.2.3 of the BAM, a predicted candidate species credit species can be considered unlikely to occur within the subject land (or specific vegetation zones) where habitat is substantially degraded such that the species is unlikely to use the area, or where an expert report identifies that the species is unlikely to be present within the subject land (or a vegetation zone within the subject land). A predicted candidate species credit species that is not considered to have suitable habitat on the subject land (or specific vegetation zones) in accordance with Section 5.2.2 of the BAM does not require further assessment on the subject land (or specific vegetation zones). The reasons for determining that a predicted candidate species credit species is unlikely to have suitable habitat on the subject land (or specific vegetation zones) is provided in **Table 4.2**.

The BAM calculator generated twenty (20) candidate species credit species that were predicted to occur on the subject land. Of the twenty candidate species credit species predicted to occur, 12 have been retained (**Table 4.2**).

Table 4.2: Assessment of habitat constraints and geographic limitations of candidate species credit species.

Scientific name / Common name	Habitat constraints	Geographic limitations	Maintained as a Candidate Species Credit Species
Acacia curranii Curly-bark Wattle	• Rocky slopes and ridges, or within 100 m of break of slope	-	No – suitable habitat is not present on the subject land (Section 5.2.2. (2b) of the BAM). No rocky habitats were found within the subject land or within 100 m of the subject land (DPIE 2022). The species was not observed during field survey.
Antaresia stimsoni Stimson's Python	• Areas within 500 m of rocks or gibber	-	No – suitable habitat is not present on the subject land (Section 5.2.2. (2b) of the BAM). No rocky habitat areas are found within the subject land or within 500 m of the subject land.
Ardeotis australis Australian Bustard		-	Yes
Burhinus grallarius Bush Stone-curlew	• Fallen/standing dead timber including logs	-	Yes
Calyptorhynchus lathami South-eastern Glossy Black-Cockatoo (Breeding)	• Living or dead tree with hollows greater than 15 cm diameter and greater than 8 m above ground	-	Yes – While there are no *Allocasuarina* and *Casuarina* species that might be a feed tree, there are hollow bearing trees that might be suitable. The species was not detected in the surveys in the subject land.

Scientific name / Common name	Habitat constraints	Geographic limitations	Maintained as a Candidate Species Credit Species
Crinia sloanei Sloane's Froglet	• Semi-permanent/ ephemeral wet areas containing relatively shallow sections with submergent and emergent vegetation, or within 500 m of wet area • Swamps within 500 m of waterbodies		No – the species was not detected during surveys of the subject land and surrounds following high rainfall, while there was surface water present following high rainfall, there is not true semi-permanent wet habitat or swamps, and this species has not been recorded from the Cobar Peneplain, the nearest records to the site being along the Crooked Creek over 80 km south east of the subject land.
Diuris tricolor Pine Donkey Orchid		-	Yes
Haliaeetus leucogaster White-bellied Sea-Eagle (Breeding)	• Living or dead mature trees within suitable vegetation within 1 km of a rivers, lakes, large dams or creeks, wetlands and coastline	-	No – The subject land is not within 1 km of any rivers, lakes, large dams or creeks, wetlands or coastlines (Section 5.2.2. (2b) of the BAM).
Hamirostra melanosternon Black-breasted Buzzard (Breeding)	• Land within 40 m of riparian woodland on inland watercourses/ waterholes containing dead or dying eucalypts	-	No - The subject land is not within 40 m of any riparian woodland habitats (Section 5.2.2. (2b) of the BAM). Further, no stick nests were recorded on the subject land during habitat surveys.
Hieraaetus morphnoides Little Eagle (Breeding)	• Nest trees – live (occasionally dead) large old trees within vegetation	-	Yes
Lepidium monoplocoides Winged Peppercress		-	No – suitable habitat is not present on the subject land (Section 5.2.2. (2b) of the BAM). Known to occur on seasonally moist to waterlogged sites.

Scientific name / Common name	Habitat constraints	Geographic limitations	Maintained as a Candidate Species Credit Species
			Found in wetland-grassland communities on waterlogged grey-brown clay soils. The entirety of the subject land is underlain by Calcarosol soils. As such suitable habitat is not present within the subject land.
Lophochroa leadbeateri Pink Cockatoo (Breeding)	• Living or dead tree with hollows greater than 10 cm diameter	-	Yes
Lophoictinia isura Square-tailed Kite (Breeding)	• Nest trees		Yes
Ninox connivens Barking Owl (Breeding)	• Living or dead trees with hollows greater than 20 cm diameter and greater than 4 m above the ground	-	Yes
Phascolarctos cinereus Koala (Breeding)	• Areas identified via survey as important habitat (see comments)	-	Yes
Polytelis swainsonii Superb Parrot (Breeding)	• Living or dead *E. blakelyi, E. melliodora, E. albens, E. camaldulensis, E. microcarpa, E. polyanthemos, E. mannifera, E. intertexta* with hollows greater than 5 cm diameter • greater than 4 m above ground or trees with a DBH of greater than 30 cm	-	No – the subject land is outside the known breeding range of this species, as described in OEH (2018) and the Conservation Advice (TSSC 2016). These BioNet records likely relate to observation of non-breeding Superb Parrots that disperse from breeding habitat, which extends as far north as the Queensland border. As such, breeding habitat for the Superb Parrot was assessed as absent (Section 5.2.2. (2b) of the BAM).
Pterostylis cobarensis Greenhood Orchid		-	Yes

Scientific name / Common name	Habitat constraints	Geographic limitations	Maintained as a Candidate Species Credit Species
Seitrostris eleryi Bristle-faced Free-tailed Bat	• Land within 500 m of watercourses or dams surrounded by Eucalypts containing hollows. Watercourses/dams are those marked on a topographic map at the highest resolution available in the area, or observed within the subject land.	-	No – watercourses and dams were mapped within 500 m of the subject land were mapped and overlaid with HBT data. This identified 3.46 ha of potential habitat within the subject land (**Figure 4.1** and **Figure 4.2**). However, comprehensive field survey (NSW SC 2004) and current data (NSW DCCEEW 2024a) indicate that the species is likely to be absent from potential habitat within the subject land. This species is known only from fifteen (15) locations nationally, and only three disjunct locations within NSW despite intensive bat surveys at 300 sites throughout the Cobar Peneplain, Darling Riverine Plains and Brigalow Belt South bioregions (NSW SC 2004). The closest known populations of this species occurs approximately 110 km west of the subject land north-west of Cobar (NSW DCCEEW 2024a), and 160 km north-west of the subject land (LPI 2023) in Gundabooka National Park where thirteen (13) individuals were recorded (OEH 2019).
Sida rohlenae Shrub Sida		-	Yes
Tyto novaehollandiae Masked Owl	• Living or dead trees with hollows greater than 20 cm diameter and greater than 4 m above the ground		Yes

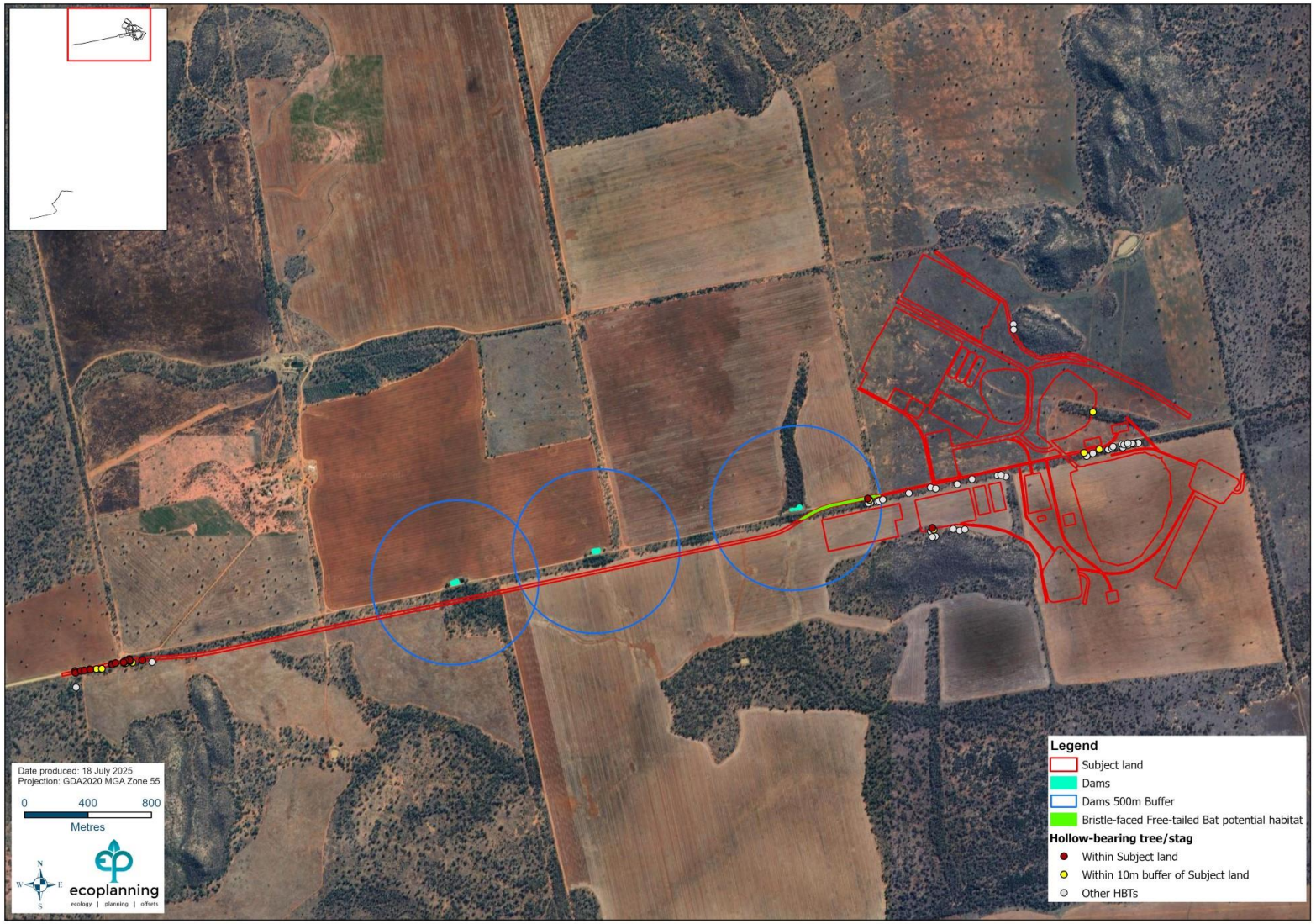


Figure 4.1: Bristle-faced Free-tailed Bat potential habitat in the subject land (north and Project area) (Ecoplanning 2025).

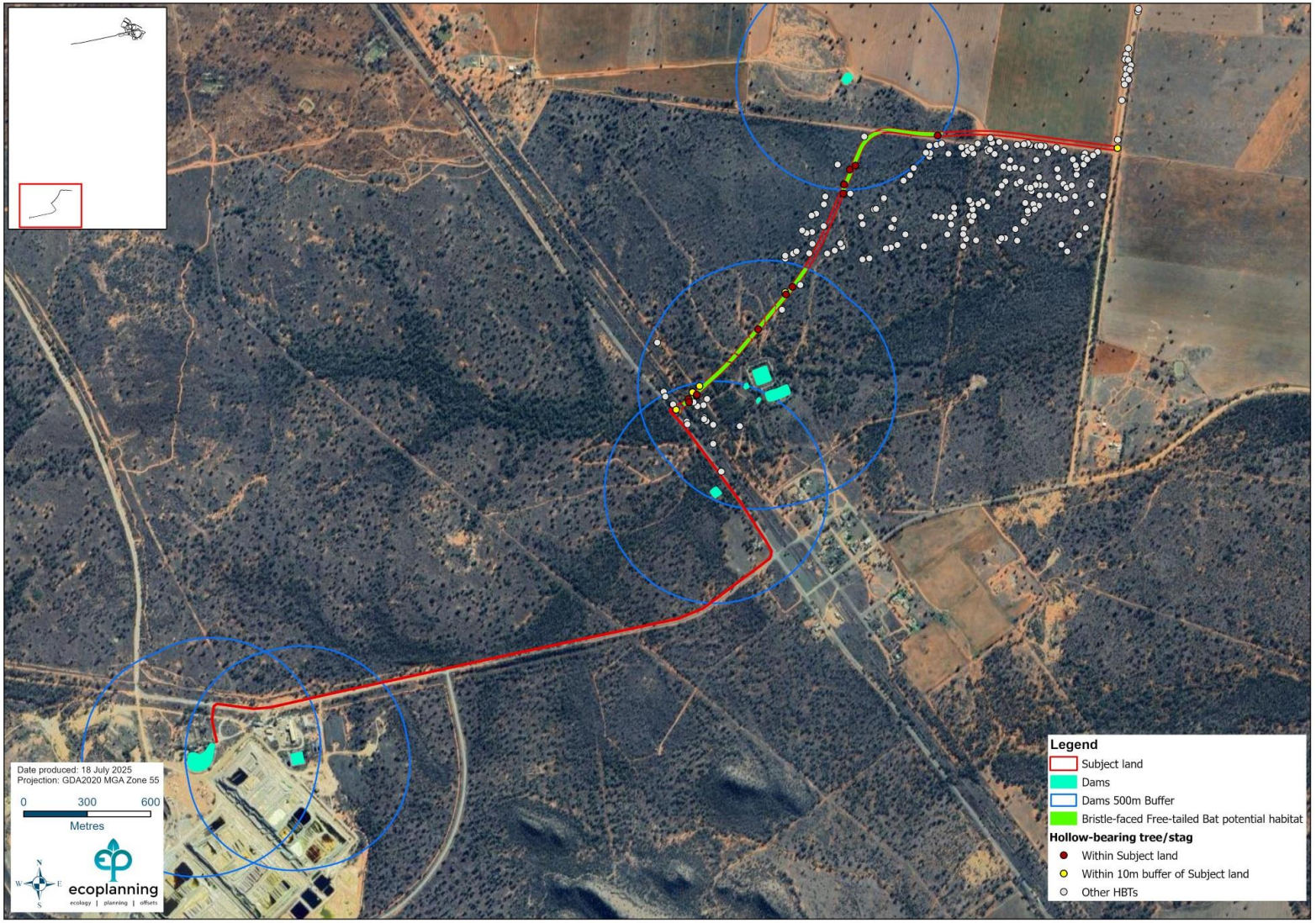


Figure 4.2: Bristle-faced Free-tailed Bat potential habitat in the subject land (south) (Ecoplanning 2025).

4.2 Determine presence or absence of candidate species credit species

Confirmed candidate species were assessed consistent with Section 5.2.3 of the BAM. Targeted surveys for candidate species credit species detectible at the time of survey were undertaken in accordance with Section 5.3 of the BAM.

Species not identified as candidate species credit species for further assessment do not require formal site survey, however, some informal survey was opportunistically conducted whilst surveying for other threatened species.

4.2.1 Targeted field surveys - flora

Targeted surveys for candidate threatened flora species were conducted within the subject land on the following dates:

- 8 October to 10 October 2021 by Bret Stewart (Senior Ecologist) and Ben Brown (Field Ecologist).
- 4 to 7 October 2022 by Simon Lee (Field Ecologist) and Mark Robinson (Senior Ecologist).
- 11 to 13 October 2022 by Bruce Mullins and Nick Agostino (note that the last survey included an area that is no longer within the subject land).
- 26 to 28 September 2023 by Mark Robinson and Nicholas Agostino.

Targeted surveys were undertaken via parallel line field traverses at a distance of 5 to 10 m apart as per guidelines outlined by DPIE (2020d). The survey was conducted over several seasons, yet there was very little overlap between seasons in survey effort. A reduced impact area and changes to the subject land means that some of the target survey was conducted on land that is no longer within the subject land.

The survey effort conducted for each of these species is shown in **Figure 3.10**, **Figure 3.11** and **Figure 3.12**.

A reference population for *Diuris tricolor* (Pine Donkey Orchid) on the Golden Highway east of Dubbo was visited in October 2021 prior to field survey, and the species was confirmed to be flowering. Another reference population for *Diuris tricolor* and *Pterostylis cobarensis* (Greenhood Orchid) at Little Mount (near Warren) was visited in October 2021, October 2022 and September 2023 prior to survey. Both species were observed in flower in 2021 and 2022, however, only *Diuris tricolor* was in flower in 2023.

The Department's threatened species survey guidelines indicate that threatened candidate species, *Diuris tricolor*, *Pterostylis cobarensis* and *Sida rohlenae* (shrub Sida) were detectible at the time of survey (**Table 4.3**). *Diuris tricolor* and *Sida rohlenae* were not found within the subject land.

Emergence of *Pterostylis cobarensis*, however, has been linked to above average rainfall (DPIE 2022b). The September 2023 surveys were not in a period of above average rainfall which may have resulted in the species lying dormant during the survey. *Pterostylis cobarensis* was not found in the areas surveyed when the reference population was in flower. However, the areas surveyed in 2023 surveys are now no longer part of the subject land, which means that the entire subject land has been adequately surveyed.

Table 4.3: Survey periods for confirmed candidate threatened flora species (blue).

	Survey period (BAM Calculator)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Diuris tricolor Pine Donkey Orchid									Y	Y		
Pterostylis cobarensis Greenhood Orchid										Y		
Sida rohlenae Shrub Sida									Y	Y		

4.2.2 Targeted field surveys – fauna

Species surveys were conducted in accordance with the BAM (DPIE 2020a) taxa-specific guidelines. Targeted surveys for candidate threatened fauna species were conducted within the subject land opportunistically via target surveys, habitat assessments, Songmeter mini acoustic recording deployment, and transects and meanders through suitable habitat (**Figure 4.3** to **Figure 4.15**). Transect surveys were conducted along Okeh Road between the two areas that compose the subject land prior to the reduction of the infrastructure corridor. Key habitat features (such as hollow bearing trees) were also mapped. Survey for some candidate fauna overlapped each other and some target orchid surveys.

Two Songmeter minis were deployed per survey period, the first being deployed on 29 August 2022 and last retrieved on 23 November 2022. Two additional songmeters were deployed outside the current subject land. Note that Songmeter 09545 (Haul Road middle) was deployed prior to the reduction of the infrastructure corridor impact area but provides a useful assessment of fauna activity in the broad Project area. Refer to **Table 4.4** for the dates and locations in which they were deployed. For candidate threatened fauna species for which suitable habitat was not surveyed within the subject land, species have been 'assumed present' in accordance with Section 5.2.4 (2a) of the BAM or an expert report has been prepared.

Table 4.4: Dates and locations of Songmeter deployment

Songmeter	Site	Survey dates	Survey nights
Unit number 08551	Project area	29/8/2022 – 2/9/2022	4
Unit number 08599	Haul Road south	30/8/2022 – 2/9/2022	3
Unit number 09545	Haul Road middle	4/10/2022 – 11/10/2022	7
Unit number 09545_B	West of subject land	11/10/2022 – 13/10/2022	2
Unit number 09553	Project area	3/10/2022 – 23/11/2022	52

Pink Cockatoo *(Lophochroa leadbeateri*) was opportunistically observed on four occasions both flying overhead and perched on trees within the subject land (**Figure 4.16**). Pink Cockatoo is a candidate species credit species for breeding habitat only. Therefore, only

impacts to known breeding habitat represent a species credit. A total of 10.11 ha of habitat for the Pink Cockatoo was identified within the subject land. This area is composed of PCT 103 'Woodland' (8.40 ha) and 'Open woodland' (1.71 ha) vegetation zone and all areas of PCT 105 (Intact) (0.05 ha). These areas all contain potential habitat required for breeding (hollow bearing trees). The survey period for Pink Cockatoo is provided in **Table 4.5**. Surveys in the subject land were conducted in 2021, 2022 and 2023 at the appropriate time of year, however, not all parts of the subject land were surveyed each year as factors, such as poor weather conditions in 2022 and time constraints, limited access to parts of the subject land.

The TBDC (DCCEWW 2024a) provides guidance on how to prepare a species polygon and what to include. A step-by-step guideline for mapping threatened species is also included in Appendix C of the BAM (DPIE 2020c). Two Pink Cockatoos were observed near a tree hollow in the southern third of the site in October 2022, however, the two birds flew away and did not further investigate the hollow. The same hollow was revisited in October 2023 to determine if the tree was being used for breeding; however, Pink Cockatoo were not recorded anywhere in the subject land during this period.

The entire length of the subject land has been surveyed for potential Pink Cockatoo breeding habitat. While there are hollow bearing trees that are potential breeding habitat, no known breeding habitat was recorded. Consequently, a species polygon has not been prepared in accordance with section 5.2.5 of the BAM for Pink Cockatoo.

Suitable habitat for Australian Bustard occurs in the subject land. This species is widespread but uncommon in NSW. It does not follow any seasonal movement pattern that may predict a more likely time to encounter the species. There are few records of the species within the Cobar Peneplain; the nearest records being found in the vicinity of the Macquarie River and Macquarie Marshes approximately 70 km east of the subject land.

The TBDC (DCCEWW 2024a) does not provide guidance on survey requirements for Australian Bustard other than a survey can be conducted at any time during the year. Being a large bird, the species is readily detected in grassland and woodlands when present (pers. obs.). The subject land and adjoining areas were traversed several times on foot and in vehicles over at least 13 days while conducting target flora surveys, mapping hollow bearing trees, target fauna survey, general reconnaissance and site access, and was not detected. Therefore, the species has been considered absent from the site and not retained as a candidate species.

The subject land and surrounds contain suitable feed trees for Koala. In the absence of field survey, an expert report was prepared by Dr Stephen Phillips (BioLink 2024, **Appendix I**). Dr Phillips' report states that:

- The range of Koala has retracted significantly from west to east in recent decades.
- Four spatially dispersed records of Koala occur on the Cobar Peneplain.
- A record at Euabalong in 2019 in a riparian zone suggests that a small remnant may persist along major watercourses.
- There is a remote possibility of a small population on the Cobar Peneplain IBRA.
- Koala is not likely to occur in the subject land and, therefore, a species occupancy polygon cannot be identified.

Therefore, in accordance with Section 5.2.3 of the BAM, no further assessment is required for Koala. Koala was not retained as a candidate species.

South-eastern Glossy Black Cockatoo is a dual credit species, and actual nest trees (i.e. confirmed breeding activity at a hollow bearing tree) constitutes a species credit. Foraging habitat for the South-eastern Glossy Black Cockatoo was not present in the subject land, yet suitably-sized hollow bearing trees were present. There are few records of South-eastern Glossy Black Cockatoo on the Cobar Peneplain, and most records are east of Nyngan. The species was not detected during surveys in the subject land and surrounds through acoustic records and direct observations. Only a short period of acoustic recording (songmeter) occurred during the survey period nominated in the TBDC (late August). These surveys were conducted at the Project Site and the southern end of the proposed Haul Road. Surveys did not identify the species in the subject land or surrounds through audible recordings, observations or other signs at any time during field surveys, therefore, no signs of breeding activity, no potential nest trees and no actual nest trees were detected. South-eastern Glossy Black Cockatoo was not retained as a candidate species.

Habitat for Bush Stone-curlew in the form of fallen / standing dead timber was present within and adjacent to the subject land across every PCT except for 103 – DNG. Habitat structure along the Okeh Road was variable but generally devoid of fallen timber, with a disturbed open woodland structure. No individuals were observed or detected via Songmeter data (cluster) analysis in Kaleidoscope Pro. Songmeter data was collected within the survey period for this species both diurnally and nocturnally. Additionally, there are no records of Bush Stone-curlew on the Cobar Peneplain. The nearest records are in the vicinity of the Macquarie Marshes, which are approximately 80 km east of the subject land. It has been concluded that Bush Stone-curlew is not present within the subject land, therefore, it is being considered 'absent' in accordance with Section 5.2.4 (2a) of the BAM in the subject land.

Little Eagle and Square-tailed Kite breeding habitat was surveyed in the form of detecting old, large live or occasionally dead nest trees within 'Open woodland' vegetation zone of PCT 103 and PCT 105 (Intact). No large stick nests were detected that may be used for breeding by Little Eagle and Square-tailed Kite within the subject land within the survey period. Therefore, Little Eagle and Square-tailed Kite were not maintained as a candidate species (breeding habitat only).

Barking Owl is associated with both PCT 103 and 105, while Masked Owl is only associated with PCT 105 (NSW DCCEEW 2024a; 2024b). The status of Barking Owl and Masked Owl changed in March 2024, such that both species are now full species credit species, rather than a dual credit species. Formerly, breeding habitat for both species was what constituted a species credit. As a consequence of this recent change, breeding habitat was surveyed (in the form of living or dead trees with hollows greater than 20 cm diameter and greater than 4 m above ground) throughout the subject land prior to March 2024. HBT's that fit these requirements are present within the subject land, however, no individuals were observed opportunistically or detected via Songmeter data (cluster) analysis in Kaleidoscope Pro. Songmeter data was collected within the survey period for these species both diurnally and nocturnally, and neither species was detected during the survey period.

Advice from the BOS Helpdesk regarding the adequacy of survey effort previously undertaken in light of the changes in the BAM, indicate that only one of the songmeters positioned at the Project area conducted an adequate level of survey. Therefore, a 400 m buffer has been drawn around this songmeter as an area where these species are confirmed as absent.

Elsewhere, these species have been assumed present in areas of suitable habitat. BioNet species sightings records (DPE 2021b) show that the nearest records are 45 km south of the subject land (Barking Owl) and 39 km south-west of the subject land (Masked Owl) in 2010 and 2009, respectively.

Sloane's Froglet was not considered a candidate species due to the absence of semi-permanent wet areas and swamps from the subject land and adjoining land. Despite the area being a dry landscape, high rainfall in September 2022 and low relief resulted in pools of surface water and ideal survey conditions for frogs. Frog surveys were conducted within and outside the subject land. Surveys included acoustic recordings and chorus census around pooled water and table drains. Surveys identified a total of 13 frog species in the subject land and surrounds, but Sloane's Froglet was not recorded. This further justifies it not being considered a candidate species (**Section 4.1.4**).

Habitat for the remainder of the candidate species credit threatened fauna species was not present within the subject land.

The initial field survey was conducted prior to Southern Whiteface being listed as vulnerable under the EPBC Act (March 2023) and vulnerable under the BC Act (December 2023). Southern Whiteface, as well as Spotted Harrier and Grey-crowned Babbler were observed and heard within the subject land (**Appendix B**). Southern Whiteface were also observed near the Project area in 2025. These species are not candidate threatened fauna species and, therefore, do not require credit offsetting, nor targeted survey effort. Habitat offsetting for these species is encompassed in the retirement of ecosystem credits.

A list of all fauna species seen or heard during field survey was recorded and is provided in **Appendix B**.

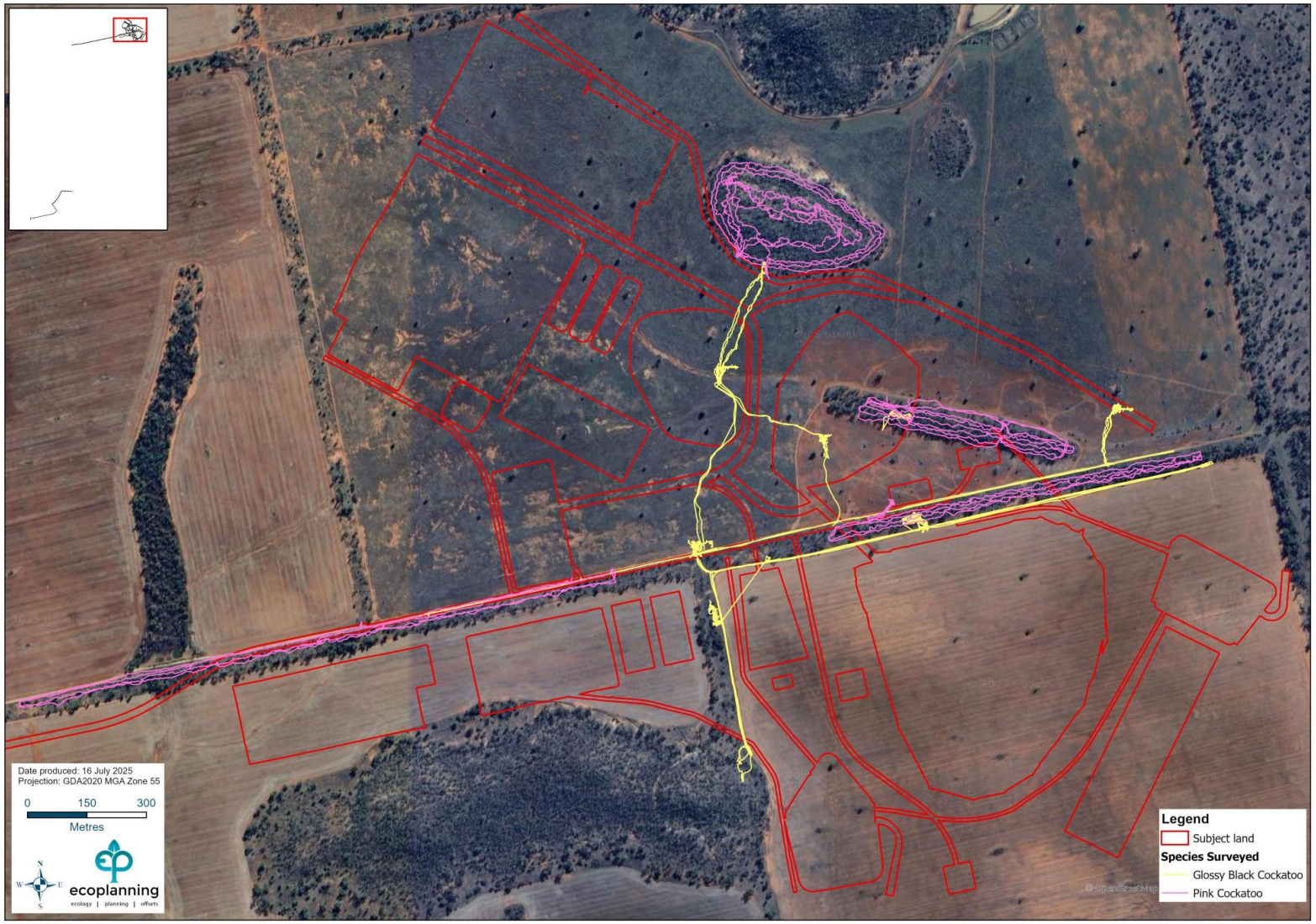


Figure 4.3: Survey effort for Pink Cockatoo and Glossy Black Cockatoo in the subject land (the Project area) (Ecoplanning 2025).



Figure 4.4: Survey effort for Pink Cockatoo and Glossy Black Cockatoo east of the Project area in the subject land (Ecoplanning 2025).

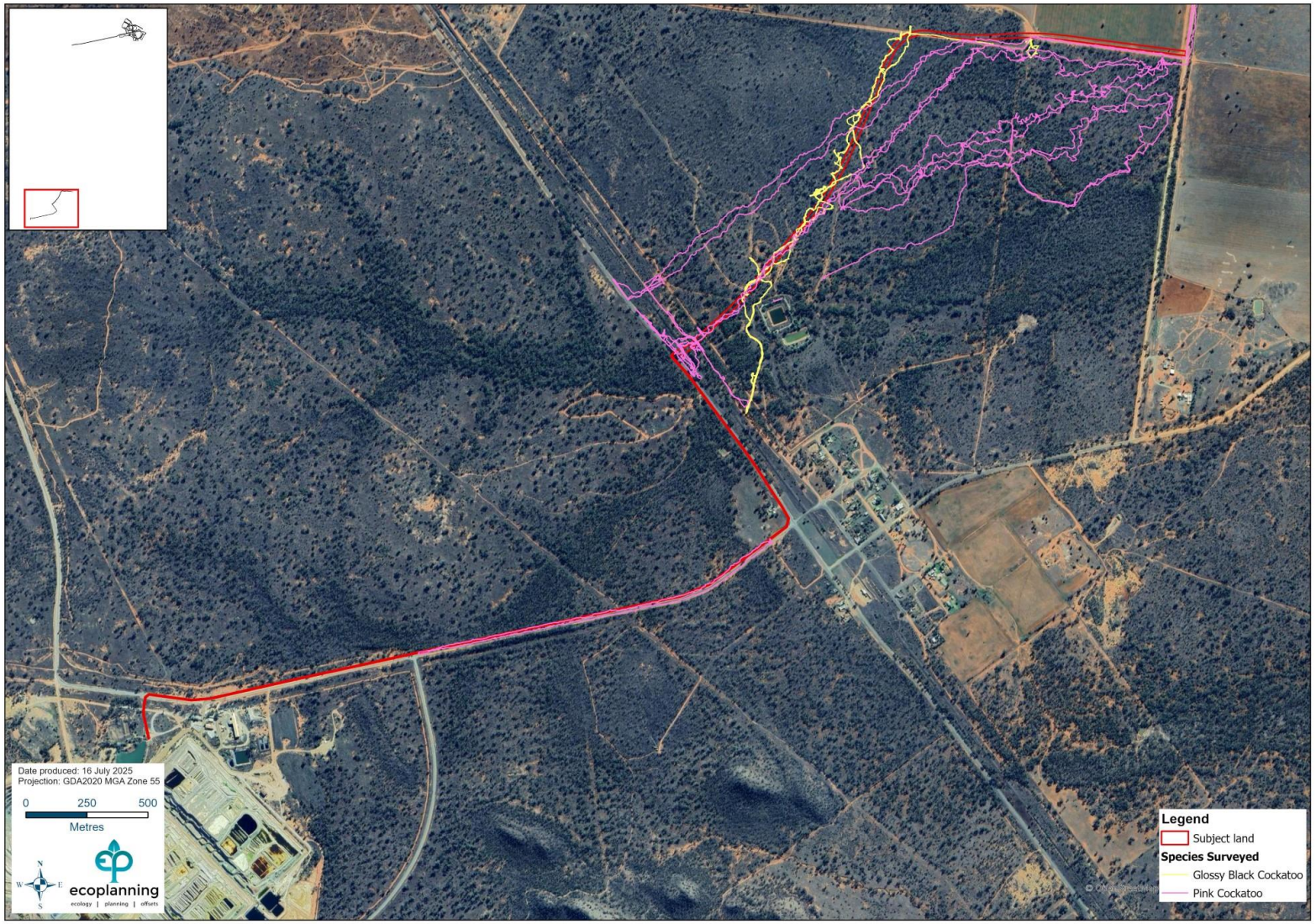


Figure 4.5: Survey effort for Pink Cockatoo and Glossy Black Cockatoo in the southern part of the subject land (Ecoplanning 2025).

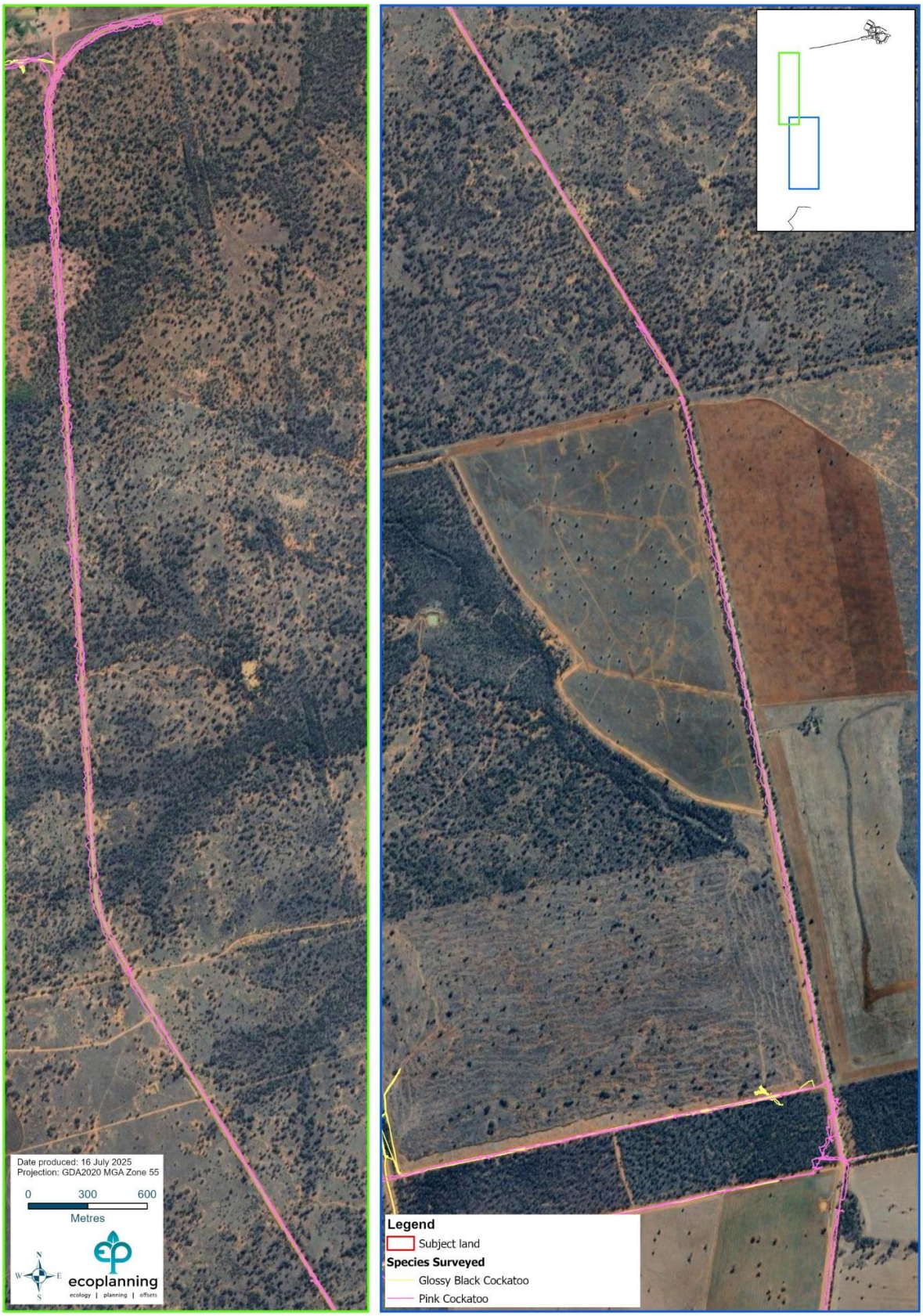


Figure 4.6: Additional survey locations for Pink Cockatoo and Glossy Black Cockatoo between the two portions of the subject land (Ecoplanning 2025).

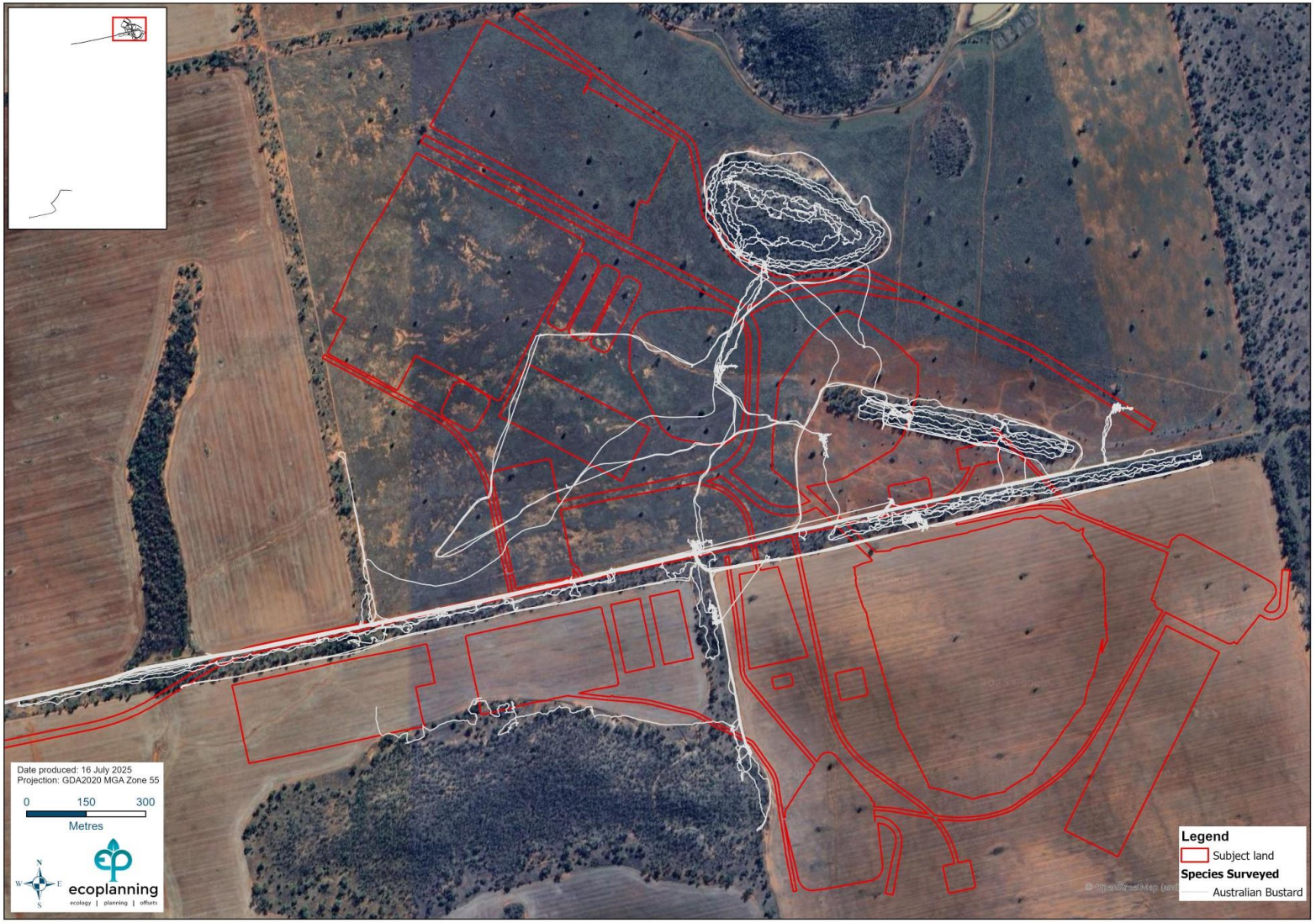


Figure 4.7: Survey effort for Australian Bustard in the subject land (the Project area) (Ecoplanning 2025).



Figure 4.8: Survey effort for Australian Bustard and Sloane's Froglet east of the Project area in the subject land (Ecoplanning 2025).

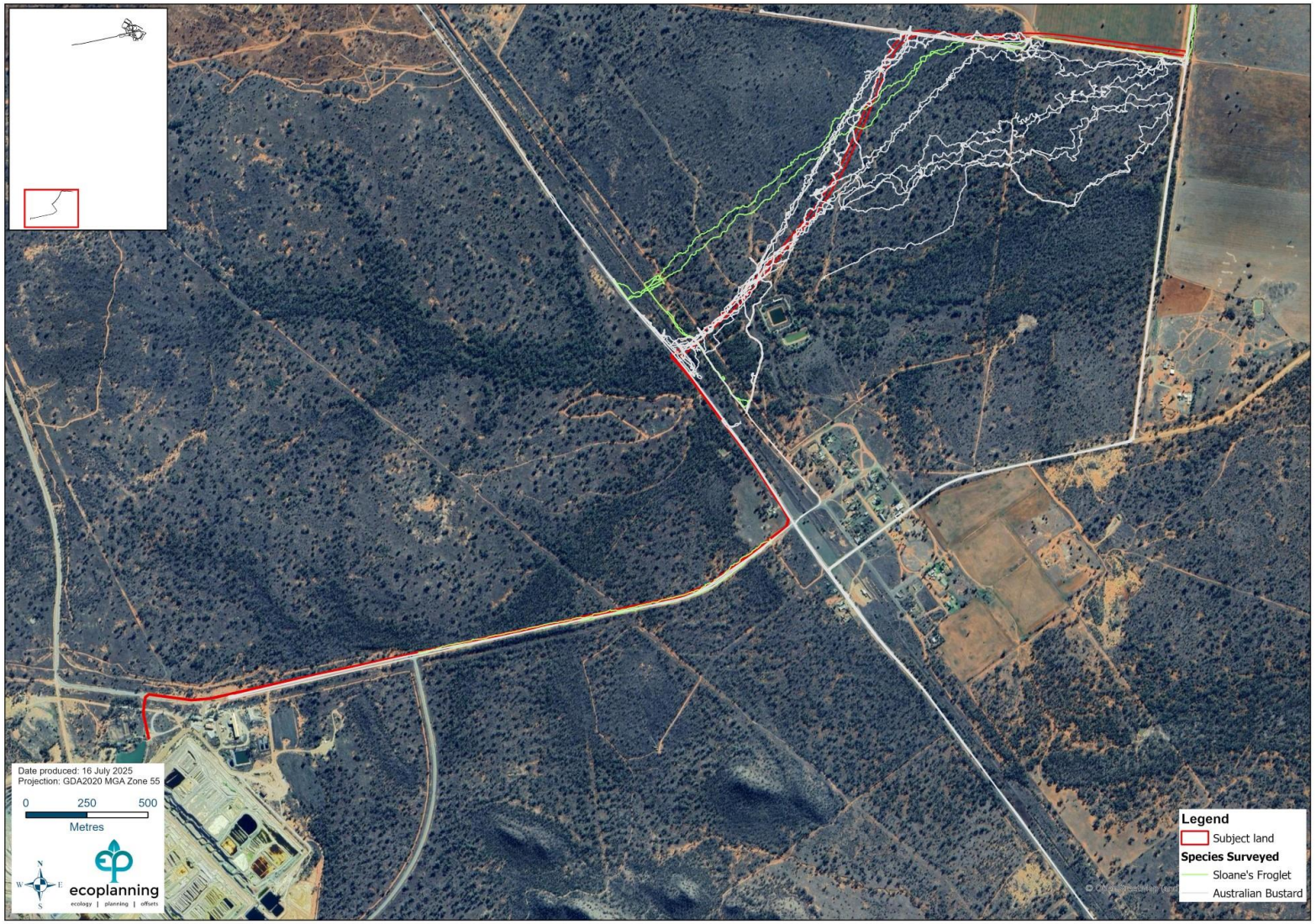


Figure 4.9: Survey effort for Australian Bustard and Sloane's Froglet in the southern part of the subject land (Ecoplanning 2025).

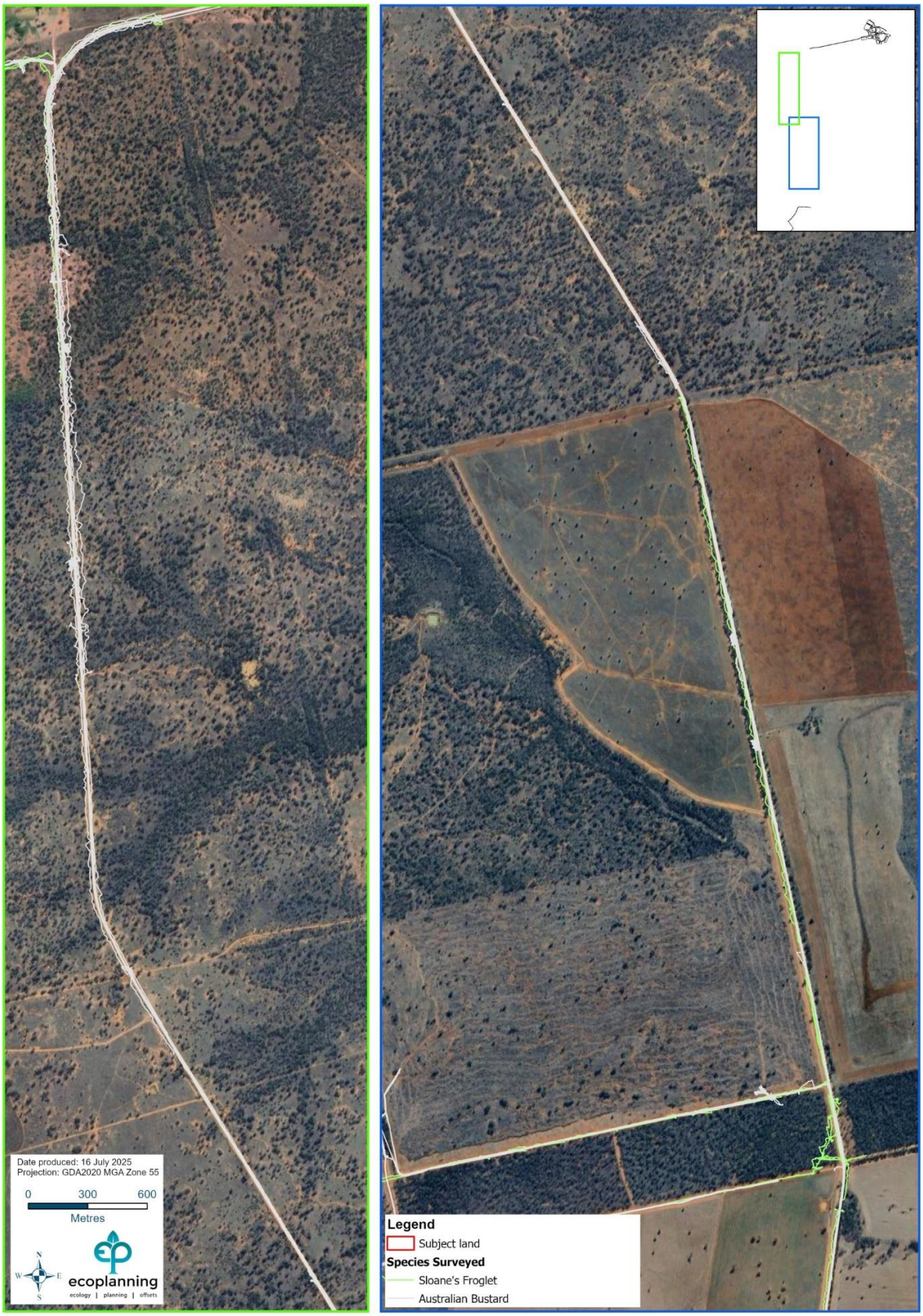


Figure 4.10: Addition survey locations for Australian Bustard and Sloane's Froglet between the two portions of the subject land (Ecoplanning 2025).

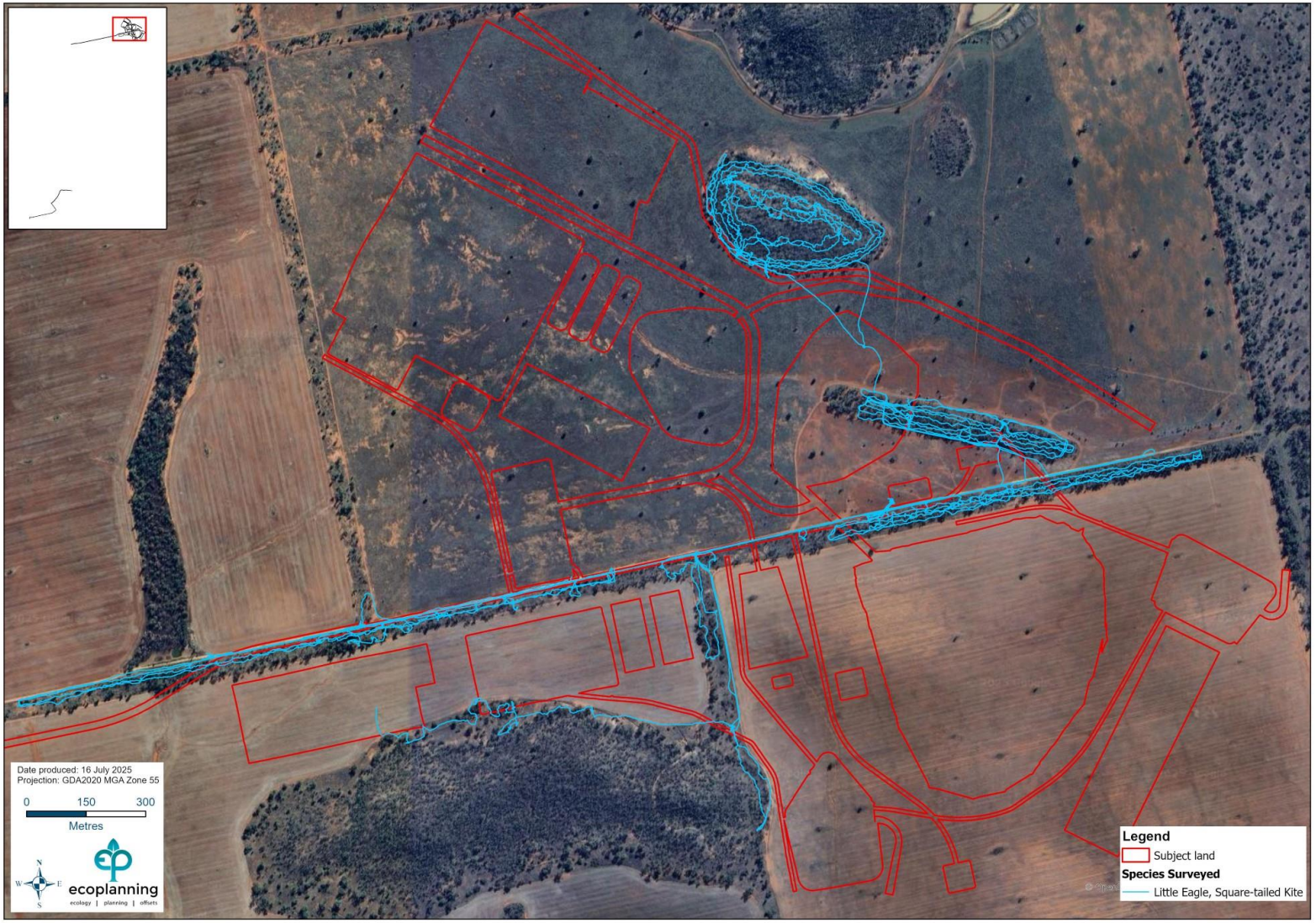


Figure 4.11: Survey effort for Little Eagle and Square-tailed Kite in the subject land (the Project area) (Ecoplanning 2025).



Figure 4.12: Survey effort for Little Eagle and Square-tailed Kite east of the Project area in the subject land (Ecoplanning 2025).

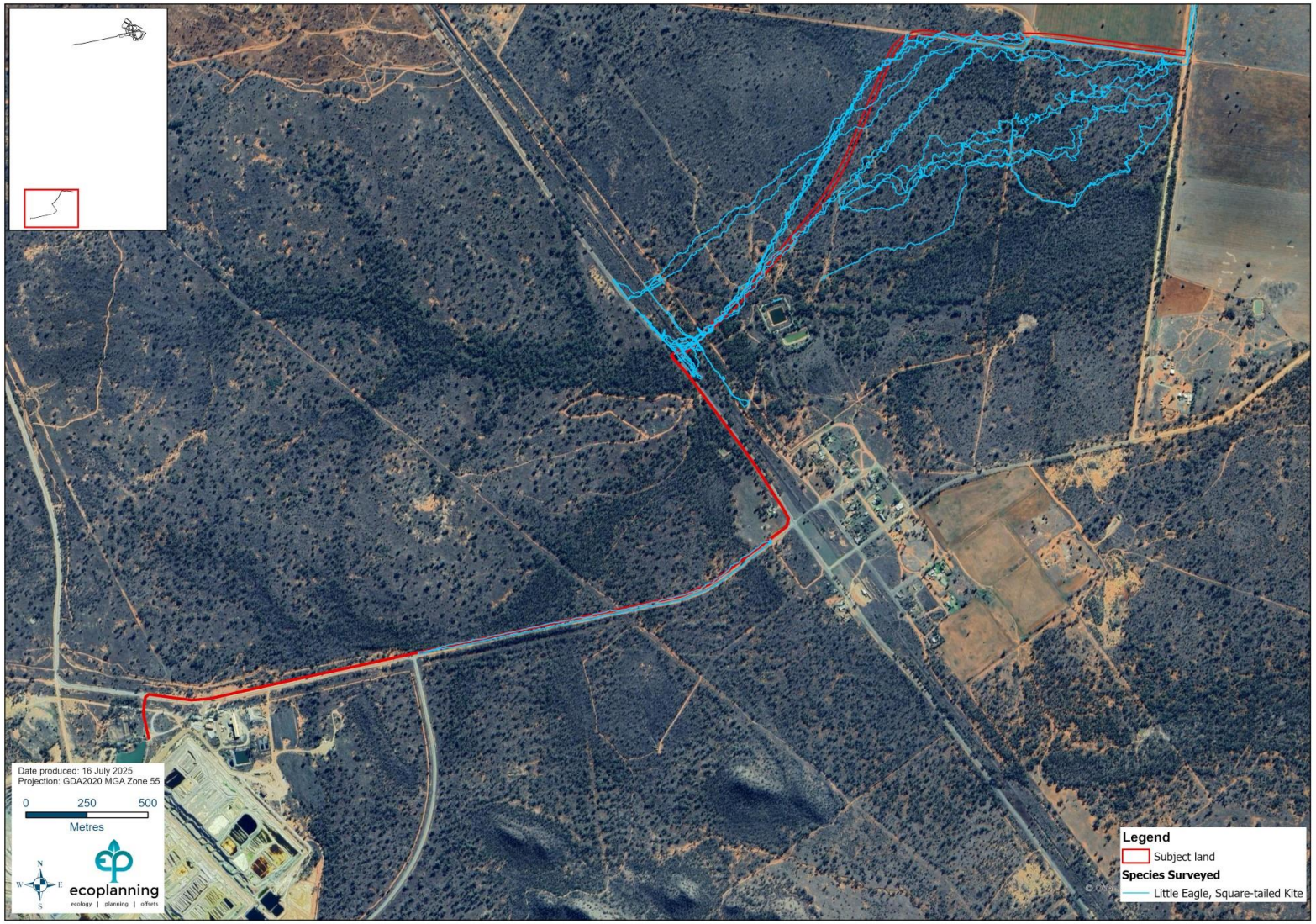


Figure 4.13: Survey effort for Little Eagle and Square-tailed Kite in the southern part of the subject land (Ecoplanning 2025).



Figure 4.14: Addition survey locations for Little Eagle and Square-tailed Kite between the two portions of the subject land (Ecoplanning 2025).

Table 4.5: Survey periods for confirmed candidate threatened fauna species, methodology and timing. Acceptable field survey period in blue. "Y" indicates when surveys were conducted.

Candidate species	Survey technique based on requirements and survey guidelines	Survey period (BAM Calculator)											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lophochroa leadbeateri Pink Cockatoo	• Deployment of four Songmeter mini devices at various locations within subject land (**Figure 4.15**) across a total of 56 nights • Opportunistic diurnal survey during survey period. • Hollow watching a *Eucalyptus intertexta* where a pair were observed foraging (**Figure 4.16**) • Traverses to detect Pink Cockatoo throughout the subject land during the survey period.								Y	Y	Y	Y	
Ardeotis australis Australian Bustard	• Traverses to detect Australian Bustard throughout the subject land during the survey period.								Y	Y	Y		
Phascolarctos cinereus Koala	• A survey guideline has been prepared for Koala: Koala (*Phascolarctos cinereus*): Biodiversity Assessment Method Survey Guide for information on targeted survey requirements and mapping species polygons. • An expert report was prepared by Dr Stephen Phillips, an approved expert for Koala under the BAM in NSW, in the absence of targeted survey.												

Candidate species	Survey technique based on requirements and survey guidelines	Survey period (BAM Calculator)											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo	• Deployment of two Songmeter mini devices; one at the Project area (29/8 - 31/8/2022) and the second at the south end of the Haul Road (30/8 - 31/8/2022) within subject land (**Figure 4.15**) over 3 days. • Traverses throughout the subject land during the survey period.								Y				
Burhinus grallarius Bush Stone Curlew	• Deployment of four Songmeter mini devices at various locations within subject land (**Figure 4.15**) across a total of 56 nights • Opportunistic diurnal survey during survey period • Traverses throughout the subject land during the survey period.								Y	Y	Y	Y	Y
Hieraaetus morphnoides Little Eagle	• Visual search for raptor stick-nests • Opportunistic diurnal survey during survey period			x					Y	Y	Y		
Lophoictinia isura Square-tailed Kite	• Visual search for raptor stick-nests • Opportunistic diurnal survey during survey period								Y	Y	Y		
Ninox connivens Barking Owl	• Deployment of four Songmeter mini devices at various locations within subject land (**Figure 4.15**) across a total of 56 nights (note that only one device collected sufficient data during October to November [52 nights])										Y	Y	

Candidate species	Survey technique based on requirements and survey guidelines	Survey period (BAM Calculator)											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Tyto novaehollandiae Masked Owl	• Deployment of four Songmeter mini devices at various locations within subject land (**Figure 4.15**) across a total of 56 nights (note that only one device collected sufficient data during October to November [52 nights])										Y	Y	
Crinia sloanei Sloane's Froglet	• Deployment of four Songmeter mini devices at various locations within subject land (**Figure 4.15**) across a total of 56 nights following above average rainfall (see **Appendix H**) • Opportunistic chorus census surveys.								Y	Y	Y		

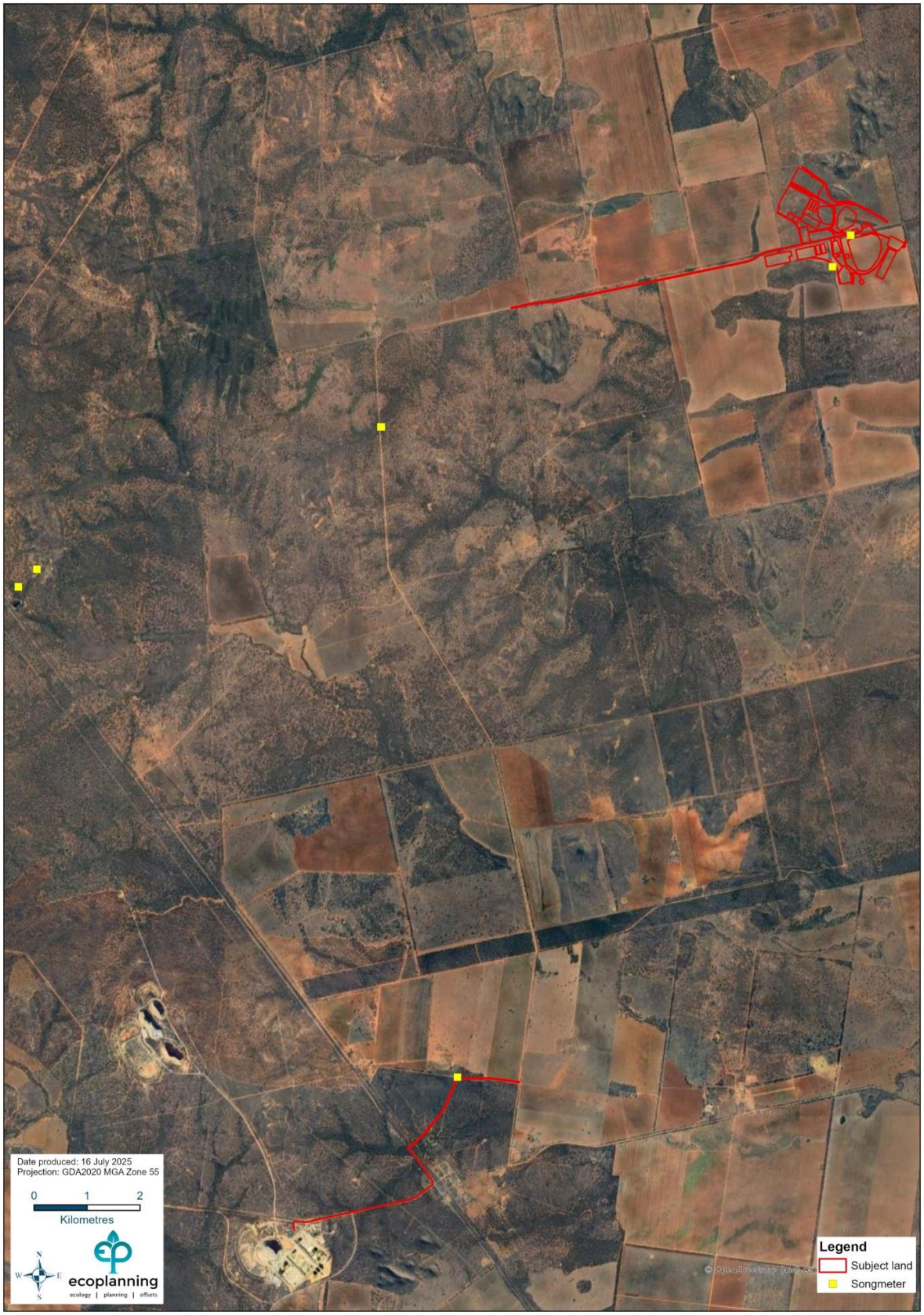


Figure 4.15: Songmeter locations with subject land, and outside subject land along infrastructure corridor route (Ecoplanning 2025).



Figure 4.16: Pink Cockatoo observed in a *Eucalyptus intertexta* on the southern proposed haul road section.

5 Identifying potential prescribed biodiversity impacts on threatened species

Prescribed biodiversity impacts are defined under Clause 6.1 of the BC Reg and Section 6 of the BAM (DPIE 2020a) and include impacts on biodiversity values in addition to, or instead of, impacts from clearing vegetation and/or loss of habitat. The presence of biodiversity values prescribed by the BC Reg 2017 and BAM (DPIE 2020a) have been considered in context of the subject land below (**Table 5.1**).

Table 5.1: Prescribed Biodiversity Impacts

Prescribed Biodiversity Impacts	Presence within the Subject Land
(a) the impacts of development on the following habitat of threatened species or ecological communities: (i) karst, caves, crevices, cliffs, rocks and other geological features of significance,	The subject land does not contain areas of karst, caves, cliffs, crevices, rocks and other geological areas of significance.
(ii) human-made structures,	The subject land does not contain human made structures and, therefore, does not have the potential to host threatened fauna species which use human made structures.
(iii) non-native vegetation,	Non-native vegetation within the subject land includes areas mapped as 'cleared' and 'non-native'. Non-native vegetation within the subject land does not conform to any ecological community, nor is it likely to support any threatened species with the potential to occur. Therefore, the Project's proposed impact to non-native vegetation within the subject area does not constitute a prescribed biodiversity impact.
(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 (impacts of development on movement of threatened species that maintains their lifecycle – BC reg),	The subject land is linear in shape and extends northward from around Murrawombie Copper Mine and North East Copper Mine into a large contiguous tract of woodland, much of which is an existing public road (see **Figure 2.1**). The development, therefore, has some potential to impact connectivity in the southern part of the subject land near the Mitchell's Highway, where the proposal haul road does not include part of an existing road. Vegetation within the remainder of the subject land occurs in an already fragmented condition, with large areas of cleared land present. Much of the Project site area has been previously cleared and is disturbed. The primary barrier to connectivity introduced into the landscape will be the proposed infrastructure

Prescribed Biodiversity Impacts	Presence within the Subject Land
	corridor near the Mitchell Highway. It is noted that new barriers to connectivity introduced from this will be very limited, with the proposed haul road to predominantly use existing public road infrastructure. New barriers to connectivity will be limited to a very small section of new road proposed to connect Okeh Rd to the Mitchell Highway, approximately 800 m north of the existing intersection at Girilambone. The proposed infrastructure corridor will be approximately 18 m wide, with haulage vehicle movements to be limited to approximately 82 movements per day. As such, the potential that the development may result in a significant impact on the movement of threatened species, such as through the potential for vehicle strike on the proposed haul road, is negligible. The development is unlikely to restrict the movement of threatened species such that it impacts their lifecycle.
(c) 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),	Generally, the undeveloped area has low variation in relief, and sheetwash from areas of higher elevation to lower elevation areas, including flooding of small depressions in the landscape, may occur during heavy rainfall events. This mapping shows that the subject land is intercepted by three (3) separate unnamed 1st order streams, two (2) separate 2nd order streams and once by a 4th order and above level stream in the south of the site (**Figure 2.2**). All these streams are ephemeral; most of them carried water in spring 2022 but were dry in autumn 2023. Surface water impact assessment for the Project indicates that the development will have negligible changes on hydrological processes, water bodies and water quality (Constellation Project - Surface Water Impact Assessment', prepared by GHD (2024). The Project site is unlikely to be impacted by floodwaters, with only minor changes to floodplain inundation and velocities in localised areas along the proposed haul road (GHD 2024). Surface water quality impacts are unlikely given the Project infrastructure has been designed to contain major rainfall events (GHD 2024).

Prescribed Biodiversity Impacts	Presence within the Subject Land
	During the construction phase, the development has potential to impact water quality on a local scale through disturbance of soils. A Surface Water Impact assessment has already been committed to a Construction Environmental Management Plan for the mitigation of soil and water impacts. Subsidence resulting from the development is likely to be minimal (Constellation Deposit - Open Pit and Underground Geotechnical Design and Groundwater Inputs PSM 2023).
(d) the impacts of wind turbine strike on threatened and protected animals,	Not applicable.
(e) the impacts of vehicle strike on threatened species or fauna that are part of a threatened ecological community.	The development will include the construction of a haul road upgrade (where necessary) of approximately 18 m wide. The majority of this haul road upgrade applies to the existing public road and private tracks which are currently being used by the public and landholders within the area. During operation, haulage vehicle movements will be limited to approximately 82 movements per day. As such, the potential that the development may result in a significant impact on the movement of a threatened species such as Pink Cockatoo via vehicle strike along the proposed haul road, is negligible. According to the conservation advice for this species, vehicle strike is considered a 'minor' consequence (Commonwealth DCCEEW 2023a). It is also noted that vehicle movements associated with mining operations will replace existing vehicle movements for Murrawombie along the existing haul road vehicle track. The development is unlikely to increase the risk of vehicle strike on threatened species such as Pink Cockatoo that it impacts a local population.

6 Avoiding and minimising impacts on biodiversity

6.1 Avoiding and minimising impacts on native vegetation and habitat during project planning

In accordance with Section 7 of the BAM, actions taken to avoid and minimise impacts through locating the project must be documented and justified in the BDAR. As outlined in Section 7.1.1 (3) of the BAM, impacts from clearing native vegetation and threatened species habitat can be avoided or minimised by locating the proposal in areas:

- lacking biodiversity values;
- where the native vegetation or threatened species habitat is in the poorest condition (i.e. areas that have a low VI score);
- that avoid habitat for species with a high biodiversity risk weighting or land mapped on the important habitat map, or native vegetation that is a TEC or highly cleared PCT; and
- outside of the buffer area around breeding habitat features such as nest trees or caves.

Additionally, Section 7.1.1 (4) of the BAM states that in selecting a project location, all of the following should be addressed:

- alternative modes or technologies that would avoid or minimise prescribed impacts;
- alternative routes that would avoid or minimise prescribed impacts;
- alternative locations that would avoid or minimise prescribed impacts; and
- alternative sites within a property on which the proposal is located that would avoid or minimise prescribed impacts.

The proposal has had six designs drafted, and each iteration has sought to reduce impacts. The proposal has been situated to avoid the most intact stands of vegetation on the site and threatened species, wherever possible. The following avoidance measures have been implemented.

Avoid

The proposed infrastructure areas, which are 159.77 ha (Project area) and 23.23 ha (infrastructure corridor), are proposed to be located in areas of existing disturbance as far as practicable (DNG and Cleared Land) to minimise impacts to higher quality and intact vegetation. The scale of the impacts has been reduced over time to avoid native vegetation. The preliminary versions of the proposal included options for the haul road and larger impacts at the Project area. The total impact on native vegetation from these options was as high as 458 ha and as low as 393 ha.

Changes in the design eliminated haul road route options that impacted native vegetation in moderate to good condition and concentrated the haul road design to Okeh Road. The width of the proposed modifications to Okeh Road to function as a haul road were reduced with each modification to the proposed development footprint. The initial assessment surveyed a haul road corridor 50 m in width along Okeh Road. This was reduced to 30 m in width, then 18 m in width to further limit biodiversity impacts. The proposal has now adopted the existing width of Okeh Road, thereby not resulting in any impact to vegetation within the road verge. A majority of the proposed haul road has been designed to fit within the existing extent of Okeh Road whilst remaining fit purpose (**Figure 1.3**). The reduction in road width and use of Okeh

Road ('existing infrastructure corridor') has reduced impacts associated with this corridor from 54.31 ha to 16.42 ha (a 70% reduction). This design has significantly reduced the number of HBT's being impacted from 309 (previous design interaction) to 48 (**Table 3.7**).

Three haul road (and infrastructure corridor) options were considered for the Project. Plots and vegetation mapping were undertaken along the route options to determine which would most effectively limit impacts to higher quality intact vegetation. The preferred infrastructure corridor option is located within patches of previously modified and disturbed land related to an existing road and land use practices. Whilst some intact vegetation will be impacted by the proposed road, the selected option generally avoids more biodiversity values than other options considered.

The southern quarter of the proposed infrastructure corridor situated between Okeh Road and the Mitchell's Highway is located in native vegetation. A number of route options were investigated, along with subtle modifications to the alignment, to identify the path that impacted the least number of hollow bearing trees in this area. Target surveys were conducted to determine the presence of candidate species beyond the proposed subject land to ensure that the final location of the haul road, as presented in the BDAR, had the lowest possible impact.

Avoidance of Crown Land (Lot 10 // DP 48604) west of the Project area (**Figure 1.1**) has resulted in an additional 0.19 ha of impacts to native vegetation (PCT 103 - Woodland) and the proposed removal of an additional 16 HBTs. Avoidance of Crown Land will:

- separate the direct impact of the infrastructure corridor containing the haul route, on the crown land lot.
- provide clear delineation for road management in the northern part of the haul route between Aeris and Bogan Shire Council. Aeris will manage the Project road/haul road from the mine site to the intersection with Okeh road as a private road. Bogan Shire Council will manage Okeh Road as the road authority for construction and management of the public road network.
- safely accommodate road-registered trucks, sized up to AB triples with 70 tonne payloads, by ensuring the road is designed for those vehicles.
- eliminate both direct and indirect impacts on two Aboriginal cultural heritage sites: Okeh 5 (#26-3-0196) and Okeh Scar Tree 8 (#26-3-0190); however it will now result in a direct impact, including total loss of cultural value, to Okeh Scar Road 9 (AHIMS#26-3-0189).

South west of the Mitchell Hwy towards Murrawombie Mine, the existing haul road will be used, and a new pipeline will be located within the road corridor, avoiding the need to clear native vegetation. Pipeline installation and route options were considered, including routes integrated with the proposed access road route and separate from it. An underground pipeline route was ultimately located within existing road disturbance (as far as possible) to avoid the need for new disturbance—further minimising potential impacts to biodiversity and Indigenous heritage. The pipeline will connect to Murrawombie Copper Mine.

While an underground pipeline is a higher cost option than a pipeline on the surface, it will provide an improved safety outcome while also supporting a minimisation of disturbance.

The orientation and layout of the Project area has been adjusted to avoid areas of native vegetation and preferentially increase disturbance to cleared land.

Minimise

The Project has been designed to minimise surface disturbance requirements at the proposed site area through optimisation of the mine design and use of existing off-site infrastructure at Tritton Copper Mine. As a predominantly underground operation (with a relatively small, 2-year open cut operation), the Project will limit its operational footprint and surface disturbance requirements. The Project will further minimise surface disturbance through the use of the existing Tritton Processing Plant, negating the need for development of additional infrastructure at Constellation.

The mine will operate under suitable environmental management plans during all life phases to minimise ongoing impacts of the Project's operation.

Progressive rehabilitation opportunities will be very limited during the operational period. A Rehabilitation Management Plan will be developed to guide ecological rehabilitation and ensure disturbed areas are returned to the approved final land use outcomes. Areas of non-operational disturbed land should be rehabilitated each year by applying imported soil cover, mulch or manures, landscaping and planting pasture grasses and seedlings. Tube stock of a variety of native shrubs and trees should also be planted in June or July of each year. Failures should be replanted in following years until vegetation is established. Rehabilitation activities should be considered in regard to mitigating impacts to threatened species. It is recommended that nest boxes be installed to recreate nesting requirements of Pink Cockatoo adjacent to, or are as near as possible to, areas of habitat removal.

A summary of the proposed mitigation measures to be implemented are provided in **Table 6.1**.

Table 6.1: Proposed mitigation measures

Identifier	Mitigation action	Development phase	Outcome	Timing	Responsibility
E01	A Construction Environmental Management Plan (CEMP) to be prepared and approved prior to clearing of native vegetation and threatened species habitat and trenching within the development site. The CEMP would include the following: • Identification of necessary hold points to ensure all biodiversity management actions are met. i.e., pre-clearing surveys followed by stage clearing of vegetation, daily inspections and fauna salvage from trenches by project ecologists. • Clearing of HBT's to be supervised by a suitably qualified ecologist following the removal of non-habitat vegetation • A stop work order if a Pink Cockatoo, Southern Whiteface or Corben's Long-eared Bat are identified using a HBT during clearance works.	Pre-construction	Flora and fauna would be managed in accordance with the requirements of the CEMP	Pre-construction and construction	Project manager Site manager
E02	• Preparation of maps to clearly identify construction limits and environmentally sensitive areas outside the subject land. • Erosion and sediment control actions in accordance with Landcom (2004) to be implemented during construction phases. • Updates to avoid and minimise indirect impacts to threatened species habitat and ecological communities located adjacent to the development site.	Pre-construction	Flora and fauna would be managed in accordance with the requirements of the CEMP	Pre-construction and construction	Project manager Site manager Project ecologist

Identifier	Mitigation action	Development phase	Outcome	Timing	Responsibility
	• Any required updates to the site induction procedure				
E03	A Weed Management Plan (WMP) to be prepared and implemented to all Project areas. The plan would include the following: • Protocols for the prevention of weed establishment. • Provision for the monitoring of invasive weeds. • Protocols for control of weeds • Monitoring of weed control success and corrective actions/alternate control strategies where controls are unsuccessful	Construction/ operations/ rehabilitation	Effective management of risk from invasive weeds to native vegetation and fauna habitat	WMP in effect throughout all Project phases and reviewed biannually	Personnel and contractors of Tritton Operations
E04	A Flora and Fauna Management Plan (FFMP) to be prepared and approved prior to clearing of native vegetation and threatened species habitat within the development site. The FFMP will include provision for the maintenance of habitat for native species, and in particular the Pink Cockatoo. Habitat maintenance will include assurance that clearing is restricted to approved disturbance areas.	Construction/ operations/ rehabilitation	Flora and fauna would be managed in accordance with the requirements of the FFMP	FFMP in effect throughout all Project phases and reviewed biannually	Aeris personnel and Project ecologist
E05	Where clearing within the Aeris block and the infrastructure corridor results in removal of a HBT with potential as Pink Cockatoo habitat trees or known/confirmed Corben's Long-eared Bat roost trees, HBT's are to be reused and/or replaced. Salvage and reuse options for HBTs will be assessed based on the characteristics of trees cleared for	Construction	Maintenance of HBTs within Project impact areas	HBT reuse subsequent to clearing within Aeris block	Aeris personnel and Project ecologist

Identifier	Mitigation action	Development phase	Outcome	Timing	Responsibility
	the Project. Where suitable, HBTs can be cut and capped, then erected as tree hollows or ground habitat. Nest boxes could also compensate for the HBTs removed. A replacement strategy of 1 nest box for every 1 HBT to be removed will be followed. Hollows that are confirmed to meet dimensions of hollows known to be used by Pink Cockatoo or are occupied by Corben's Long-eared Bat should be salvaged where possible.			during Project construction	
E06	Site inductions during construction to include a briefing regarding the local fauna of the site and protocols to be undertaken if fauna are encountered.	Construction	Prevents fauna injury/mortality	Construction	Construction contractor
E07	Prior to the commencing vegetation clearing, the project ecologist will conduct a pre-clearing survey to confirm the absence of any breeding fauna within the trees to be removed.	Construction	Prevents fauna injury/mortality	Pre-construction	Project ecologist
E08	Vegetation occurring within the first 30 m of the boundary of the subject land would be monitored to ensure it is not being indirectly impacted by construction for the development (e.g., establishment of weeds, erosion and sedimentation or from earthworks). Where impacts are detected, the project ecologist would prepare an adaptive management plan to avoid further impacts.	Construction	Prevention of indirect impacts to adjacent vegetation	Monthly during construction	Construction contractor in conjunction with neighbouring land owners Project ecologist

Identifier	Mitigation action	Development phase	Outcome	Timing	Responsibility
E09	The project ecologists adhere to the trench clearing and infilling protocols. The protocols include: • daily inspection of open trenches daily • remove and relocate fauna trapped within the trench • cover trenches wherever possible • erect temporary fencing around the trench • minimise the length of the open trench at any time by limiting excavation and progressively infilling the trench • cap stockpiled and installed pipe.	Construction	Prevents fauna injury/mortality	Construction	Project ecologist and Construction contractor
E10	Frequent maintenance of construction machinery and plant will be undertaken to minimise unnecessary noise or air pollution.	Construction	Minimises disruption to fauna foraging, nesting or roosting behaviours	Construction	Construction contractor
E11	If any animal is injured during the clearing process, the relevant local wildlife rescue agency (e.g., WIRES) and/or veterinary surgery will be contacted as soon as practical. Until the animal can be cared for by a suitably qualified animal handler, if possible, minimise stress to the animal and reduce the risk of further injury by: • Handling fauna with care and as little as possible. • Covering larger animals with a towel or blanket and placing in a large cardboard box.	Construction / Operation	Prevents fauna injury/ mortality	Pre-construction, construction	Construction contractor Wildlife handler / suitably qualified Ecologist

Identifier	Mitigation action	Development phase	Outcome	Timing	Responsibility
	• Placing small animals in a cotton bag, tied at the top. • Keeping the animal in a quiet, warm, ventilated and dark location.				
E12	Aeris will update the Tritton Operations Bushfire Management Plan to include the Project areas, including the Aeris block where the new road is proposed and the majority of impacts to conservation significant species is located. • The BMP will provide for the management and control of fire hazards by monitoring and maintaining areas for bushfire hazards. • Identify the response to control outbreaks of fires. • Protect the biodiversity habitat within the Aeris block from fire damage.	Construction / Operation	Prevents potential impacts to fauna habitat	Construction / Operation	Personnel and contractors of Tritton Operations
E12	Rehabilitation of the Aeris block, where a new road is proposed, will prioritise restoration of habitat for fauna. The Rehabilitation Strategy (Burton Environmental 2024) identifies the post closure strategy for this land is yet to be determined and requires consultation with Bogan Shire Council. Aeris will seek to replace all trees removed within the Rehabilitation Strategy for this block, where agreement can be reached with Bogan Shire Council. The Rehabilitation Strategy will include the use of flora species suitable for Pink Cockatoo and Southern Whiteface habitat.	Rehabilitation	Replacement of habitat trees within rehabilitation strategy	Rehabilitation phase	Personnel and contractors of Tritton Operations

6.2 Avoiding and minimising prescribed biodiversity impacts during project planning

Section 7.2 of the BAM outlines avoidance and mitigation with respect to prescribed impacts. The nature of prescribed impacts mean they can be difficult to offset through the provision of biodiversity credits (e.g., impacts to caves, rocky outcrops and flyways) and cannot be readily replaced. Therefore, it is important that measures to avoid or minimise impacts to these features are prioritised.

Prescribed biodiversity impacts are defined under Clause 6.1 of the BC Reg and include impacts on biodiversity values in addition to, or instead of, impacts from clearing vegetation and/or loss of habitat. Prescribed biodiversity impacts are outlined within **Table 5.1** including their relevance to the proposal, and are summarised here:

- The clearing of non-native vegetation
- Impacts on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range
- Impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities
- Impacts of vehicle strike on threatened species or fauna that are part of a threatened ecological community.

Potential impacts in relation to hydrology and water quality during the construction phase are to be managed as per the recommendations outlined in **Section 6.6**.

6.3 EPBC Act Assessment of Significance (AoS)

A EPBC Act Protected Matters Report for the site and a 25 km buffer was generated on 14 July 2025 using the Protected Matters Search Tool (PMST). The PMST identified five (5) threatened ecological communities, thirty (30) threatened species (**Table 6.2**), and eight (8) migratory species with potential to occur in the subject land or 25 km buffer. Vegetation assessments and habitat surveys of the site are sufficient to rule out the presence of all protected entities identified by the PMST search, with the exception of Pink Cockatoo, Southern Whiteface and Corben's Long-eared Bat. An initial field survey was conducted prior to the listing of Pink Cockatoo as endangered under the EPBC Act in March 2023 and prior to Southern Whiteface being listed as vulnerable under the EPBC Act (March 2023).

Poplar Box Grassy Woodland on Alluvial Plains is listed as an endangered ecological community. While *Eucalyptus populnea* subsp. *bimbil* (Poplar Box) is a dominant and co-dominant species in the canopy of some PCTs in the subject land, these PCTs are not associated with the listed entity (DoEE 2019). The Conservation Advice lists the PCTs that conform to the listed entity, and PCT 103 and PCT 105 are not named.

A full list of all threatened ecological communities threatened species and migratory species generated from the PMST is shown in **Appendix G**.

Table 6.2: Summary of likelihood of occurrence for MNES threatened species

Scientific name	Common name	Threatened category	Likely occurrence
Pedionomus torquatus	Plains-wanderer	Critically endangered	No. The stronghold for the species is the Riverina of NSW where is inhabits low, open grassland and sparse chenopod shrublands
Lathamus discolor	Swift Parrot	Critically endangered	No. The species uses winter flowering eucalypts on the east coast, and rarely is recorded on the Cobar Peneplain
Amytornis striatus striatus	Mukarrthippi Grasswren	Critically endangered	No. Likely extinct in the region. There is only one record that is from the late 1800s.
Calidris ferruginea	Curlew Sandpiper	Critically endangered	No. There is no suitable habitat in the areas
Rostratula australis	Australian Painted Snipe	Endangered	No. There is no suitable habitat in the area
Botaurus poiciloptilus	Australasian Bittern	Endangered	No. There is no suitable habitat in the area
Melanodryas cucullata cucullata	South-eastern Hooded Robin	Endangered	No. Suitable habitat was in the area, but the species was not recorded during site surveys which spanned three successive spring periods.
Lophochroa leadbeateri leadbeateri	Pink Cockatoo (eastern)	Endangered	**Yes**. The species was recorded in the study area. Most observations were of individuals or pairs flying overhead. No breeding activity was observed.
Calidris acuminata	Sharp-tailed Sandpiper	Vulnerable	No. There is no suitable habitat in the area
Leipoa ocellata	Malleefowl	Vulnerable	No. There is no suitable habitat in the area
Polytelis swainsonii	Superb Parrot	Vulnerable	No. There is potential for species to occur out of the breeding season as it disperses into feeding areas. The study area is located just beyond the western edge of its range.
Aphelocephala leucopsis	Southern Whiteface	Vulnerable	**Yes**. The species was observed in the study area
Stagonopleura guttata	Diamond Firetail	Vulnerable	No. Suitable habitat was in the study area, but the species was not recorded during site surveys which spanned three successive spring periods.
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	Vulnerable	No. Whilst there are a few records of South-eastern Glossy Black Cockatoo on the Cobar Peneplain and east of Nyngan, the species was not detected during surveys

Scientific name	Common name	Threatened category	Likely occurrence
			in the subject land and surrounds through acoustic records and direct observations which spanned three successive spring periods.
Gallinago hardwickii	Latham's Snipe	Vulnerable	No. There is no suitable habitat in the area
Neophema chrysostoma	Blue-winged Parrot	Vulnerable	No. The species is not known to breed in NSW, and foraging habitat is mainly in the south western parts of the state. Suitable habitat was in the study area, but the species was not recorded during site surveys which spanned three successive spring periods.
Falco hypoleucos	Grey Falcon	Vulnerable	No. There are very few records of the species in NSW. Suitable habitat was present in the study area, the species was not recorded during site surveys which spanned three successive spring periods.
Grantiella picta	Painted Honeyeater	Vulnerable	No. There was very little mistletoe in the study area, and mallee and Weeping Myall woodlands with which it is frequently associated are not present. While the movements of the species are somewhat erratic, the species was not recorded during site surveys which spanned three successive spring periods.
Bidyanus bidyanus	Silver Perch	Critically endangered	No. There are no permanent watercourses in the study area
Macquaria australasica	Macquarie Perch	Endangered	No. There are no permanent watercourses in the study area
Maccullochella macquariensis	Trout Cod	Endangered	No. There are no permanent watercourses in the study area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)	Koala	Endangered	No. An expert report has been prepared by Dr Phillips that discussed the contraction of the koala population from west to east, with it virtually absent from the Cobar Peneplain. Low density remnant populations may be present along the major rivers.
Nyctophilus corbeni	Corben's Long-eared Bat	Vulnerable	**Possible**. A survey has not been conducted to determine the presence of the species. Corben's Long-eared Bat often roosts in the hollows of small dead trees, such as Buloke. The proposal will remove 48 live hollow bearing trees.
Bertya opponens		Vulnerable	No. The species was not recorded during field survey

Scientific name	Common name	Threatened category	Likely occurrence
Lepidium monoplocoides	Winged Pepper-cress	Endangered	No. The species was not recorded during field survey and suitable habitat was not present
Maireana cheelii	Chariot Wheels	Vulnerable	No. The species was not recorded during field survey and suitable habitat was not present
Austrostipa metatoris		Vulnerable	No. The species was not recorded during field survey
Swainsona murrayana	Slender Darling-pea	Vulnerable	No. The species was not recorded during field survey and suitable habitat was not present
Anomalopus mackayi	Five-clawed Worm-skink	Vulnerable	No. The species occurs north of the Cobar Peneplain towards the WLD border
Hemiaspis damelii	Grey Snake	Endangered	No. The species typically occurs on heavy, cracking clays. This habitat is not present in the study area.

EPBC Act Significant Impact Guidelines (DotE 2013)

A referral is recommended for matters of national environmental significance protected under the EPBC Act. No EPBC Act listed threatened ecological communities are likely to be significantly impacted by the proposed action.

The EPBC Act AoS seeks to identify important, notable, or of consequence impacts related to the proposed Project. Through completing the EPBC Act AoS (**Appendix C**), significant impact criteria were assessed for the following listed threatened species:

- Pink Cockatoo (*Lophochroa leadbeateri*)
- Southern Whiteface (*Aphelocephala leucopsis*)
- Corben's Long-eared Bat (*Nyctophilus corbeni*)

Pink Cockatoo is an endangered species under the EPBC Act. *Conservation Advice for Lophochroa leadbeateri (eastern Pink Cockatoo)* (Commonwealth DCCEEW 2023a) evaluates the impacts of the proposal against the Risk Matrix table presented in **Appendix F**. A number of threats are identified as having consequences ranging from Minor to Major, with the associated risks at a species level ranging from Moderate to Very High. The clearing of native vegetation, loss of hollow-bearing trees and the increased competition for nest hollows as a result of this are considered to be 'Major' consequences for this species (Commonwealth DCCEEW 2023a). On the basis of the impact to the Pink Cockatoo foraging habitat and removal of 48 hollow bearing trees, the number of proximal records and opportunistic sightings it is recommended that the Project is referred to the Commonwealth Minister (**Appendix C**).

An AoS for Southern Whiteface (recently listed as a vulnerable species under the EPBC Act), was conducted (**Appendix C**) with the conclusion being made that this species does not require a referral for this project. The significant Impact Criteria for a vulnerable species includes several matters that are relevant to an "important population". An "important population" has not been identified for the species. *Conservation Advice for Aphelocephala leucopsis (Southern Whiteface)* (Commonwealth DCCEEW 2023b) describes habitat critical to the survival of the species which includes all habitat from where the species is known to occur. Whilst habitat in which the species is known to occur will be impacted, it is not considered that the impact will be significant in which it will lead to a decline in the local population. It is, therefore, not recommended that the Southern Whiteface be referred to the Commonwealth.

It is possible that Corben's Long-eared Bat occurs in the study area. A survey for microbats has not been completed, given that this species was not predicted by the BAM-C as occurring in the study area is an ecosystem credit species in the BAM. Despite the proposal removing up to 10.11 ha of potential habitat, which includes 48 HBTs, the impact of the proposal is predominantly linear through woodland areas reducing the potential for habitat for the species becoming fragmented. Further, mitigation measures are recommended to reduce the potential for the project to impact this species.

Note that the proposal was referred to the Commonwealth minister. The revised Project alignment is recommended to be amended for submission to the Commonwealth minister.

6.4 Assessment of impacts

6.4.1 Assessing impacts to native vegetation and habitat

The proposed development will include direct impacts to:

- 97.48 ha of PCT 103 - Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion
- 0.05 ha of PCT 105 - Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion
- 87.39 ha of cleared land (no PCT) will be impacted by the proposed development. However, as this area adheres to no native PCT and has no associated breeding or foraging habitat for threatened species, there is no calculated offset liability.

The direct clearing and subsequent development of the subject land would represent a permanent impact, and in accordance with Section 8.1.1 of the BAM, the future VI score for all vegetation within the subject land has been assigned a VI score of zero (0).

6.4.2 Assessing indirect impacts on native vegetation

Indirect impacts may include, but are not limited to, noise pollution, dust, vibrations, erosion, run-off associated with the stockpiles and disturbed earth, and fauna failing into open trenches when installing the pipeline. Further, within adjacent areas of habitat, the project is considered unlikely to cause any increase in the trampling of flora, rubbish dumping, or other anthropogenic disturbance. The proposed development will lead to a minimal increase in human activity in the area of the proposed haul road and site infrastructure area, however, this will be limited to the subject land only. The introduction of pests, weeds, or pathogens above levels currently found in the area will be managed in the implementation of the site-specific environmental management plans. A Code of Practice for exploration licences and assessment leases for all resource types (NSW Resources Regulator 2022) sets out mandatory requirements and provides title holders with related guidance about ensuring that exploration manages and minimises risks to the environment. This approach should be followed in all stages of the mine life.

Indirect impacts will be managed through the development of appropriate environmental management plans, whereby sediment and erosion controls will be put in place according to best practices (Landcom 2004).

Further information regarding mitigation measures which would aim to avoid any indirect impacts are included in **Section 6.6**.

6.5 Assessing prescribed biodiversity impacts

As described in **Table 5.1**, and in accordance with Section 8.3 of the BAM, minimal prescribed biodiversity impacts are anticipated from the proposed development in the form of habitat connectivity caused by the construction of the infrastructure corridor. Impacts to habitat associated with native vegetation are calculated an included in **Section 7**.

6.6 Mitigating and managing impacts on biodiversity values

The proposal has been designed to avoid biodiversity impacts, where possible, and locate impacts in cleared land as far as practicable.

The proposed infrastructure corridor will impact a high number of hollow bearing trees in the southern half of the route. A number of route options were investigated to identify a pathway that impacted the fewest hollow bearing trees, and there are hundreds of HBTs that will remain adjacent to the subject land.

The infrastructure corridor was initially designed as a 50 m wide corridor, but was reduced to 18 m, and then to the current width of Okeh Road to further limit biodiversity impacts. The majority of intact vegetation (88%) proposed to be impacted by the development fell within the previous design of the infrastructure corridor. The new haul road design which has been altered to fit within the existing extent of Okeh Road and has significantly reduced impacts to native vegetation by 29.17 ha and reduced the number of hollow bearing trees being impacted from 309 to 48 (**Table 3.7**).

Trenching required to install the buried pipeline may inadvertently trap some fauna. A protocol is included to ensure that trapped fauna are removed before work is conducted within the trench and trenches are infilled once the pipe is installed.

Other measures will be implemented to mitigate and manage direct and indirect impacts where possible, including the preparation of a Construction Environmental Management Plan (CEMP), and appropriate preclearance protocols. Details are provided in the following sections.

6.6.1 Pre-clearance protocols

Several threatened and non-threatened fauna species were recorded within the subject land (**Appendix B**). Appropriate pre-clearance protocols are to be put in place at the time of vegetation clearing to mitigate and avoid potential harm or injury to these individuals. These protocols should include, as a minimum, soft-felling techniques and clearing supervision where habitat trees (where nests or other habitat features are identified) are to be removed.

Soft-felling techniques as part of vegetation clearing encourages fauna to relocate outside of the disturbance footprint prior to habitat clearing or alternatively provide an opportunity to move fauna during vegetation clearing works. Soft felling techniques should be adaptive depending on site species conditions but typically includes:

- marking of all habitat trees to be cleared and demarcate the clearing boundary to avoid removing or impacting trees to be retained,
- removal of ground-layer and mid-storey vegetation (under-scrubbing) around habitat trees,
- tapping/nudging of habitat trees by heavy machinery prior to the removal of habitat trees,
- clearing of habitat trees by bulldozing with or without linked chains will not be permitted to prevent increased likelihood of injury or death to fauna.
- soft felling controlled by machinery will be used to keep hollows intact and limit potential impacts to nesting fauna. Soft felling involves the use of machinery (blade, claw or bucket) positioned at the base of the tree trunk over the structural roots. The position of the machinery on the roots controls the slow drop of the tree,

- inspection of lowered habitat trees and capture and release of any fauna species present. Injured wildlife is to be taken to an appropriately qualified wildlife carer or the nearest veterinary clinic.

As a precaution, if construction works are to occur during the breeding period of Southern Whiteface, Pink Cockatoo or Corben's Long-eared Bat, a qualified ecologist should inspect the HBTs onsite for nesting individuals as removal of an active nest/maternity roost, noise pollution and clearing of adjacent vegetation may pose a risk to their breeding cycle.

6.6.2 Trench clearing and infilling protocols

Some fauna species recorded within the subject land (**Appendix B**) have the potential to fall into open trenches and become trapped. Protocols are required to mitigate and avoid potential harm or injury to fauna that might fall into an open trench. These protocols should include:

- wherever possible, trenches should be covered overnight
- a suitably qualified person will inspect open trenches daily prior to works to remove fauna and relocate them to similar nearby habitat;
- minimise the length of the open trench to limit the potential for fauna to become trapped
- progressively infill the trench to minimise the area/length of open trench;
- cap installed pipe so that fauna do not enter and become trapped within the pipe; and
- cap stockpiled pipe as appropriate to prevent fauna entering pipe.

6.6.3 Management plans

To avoid potential indirect offsite impacts during construction, an FFMP as well as an appropriate erosion and sedimentation control plan should be in place following best proactive protocols such as Landcom (2004). It is recommended that this is included in appropriate site-specific environmental management plans prior to any construction works commencing. Specific management plans addressing potential impacts Pink Cockatoo and the loss of hollow bearing trees are also recommended.

Appropriate management plans will be required during, and post construction periods, and will include the above pre-clearance and fauna management protocols.

6.7 Thresholds for the assessment and offsetting of impacts of development

6.7.1 Serious and Irreversible Impacts (SAII)

Section 6.7 of the BC Reg defines Serious and Irreversible Impacts (SAII) as impacts likely to contribute significantly to the risk of threatened species or ecological communities becoming extinct due to the following:

a) it will cause a further decline of the species or ecological community that is currently observed, estimated, inferred, or reasonably suspected to be in a rapid rate of decline, or
b) it will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred, or reasonable suspected to have a very small population size, or

c) it is an impact on the habitat of the species or ecological community that is currently observed, estimated, inferred, or reasonably suspected to have a very small population size, or
d) the impacted species or ecological community is unlikely to respond to measures to improve its habitat and vegetation integrity and, therefore, its members are replaceable.

The guidance to assist a decision maker to determine a SAII (DPIE 2019a) was used to determine whether or not an impact on biodiversity values is likely to be a SAII. The guide lists in Appendix A criteria for identifying potential species and ecological communities that meet the SAII principles, listed above.

No threatened species or ecological communities defined as potential SAII entities have been identified within the subject land and none are predicted to occur within the subject land.

6.7.2 Impacts which require an offset

Section 9.2.1 of the BAM indicates that the following vegetation zones will require offsets:

a) a vegetation zone with a VI score ≥15 *and* the PCT is representative of an Endangered Ecological Community (EEC) or Critically Endangered Ecological Community (CEEC),
- a vegetation zone with a VI score ≥17 *and* the PCT is associated with threatened species habitat (as represented by ecosystem credits) *or* represents a vulnerable ecological community,
- a vegetation zone with a VI score ≥20 *and* the PCT does not represent a TEC *and* is not associated with a threatened species habitat.

Vegetation zones PCT 103 - Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland in the 'Woodland', 'Open Woodland', and 'DNG' condition states, as well as all areas of PCT 105 - Poplar Box grassy woodland require offsetting as these vegetation zones meet criteria b) above, namely:

- a vegetation zone with a VI score ≥17 and the PCT is associated with threatened species habitat (as represented by ecosystem credits) or represents a vulnerable ecological community.

The vegetation zones on the subject land all have VI scores of ≥17 /100 class (**Table 3.7**) and are not associated with any TEC's.

6.7.3 Impacts that do not require further assessment

There are no other impacts that require offsetting.

7 Final credit calculations

A biodiversity offset requirement for residual impacts of a proposed development must be calculated in accordance with Section 10.1 and Section 10.2 of the BAM. The following section outlines the credit requirements for the development to achieve the 'no net loss standard' as established by the BAM.

7.1 Impacts which require an offset

Section 9.2.1 of the BAM indicates that the following native vegetation zones require offsets:

- vegetation zones that have a VI score ≥15 where the PCT is representative of an endangered (EEC) or critically endangered ecological community (CEEC)
- a vegetation zone that has a VI score of ≥17 where the PCT is associated with threatened species habitat or is a vulnerable ecological community
- a vegetation zone that has a VI score ≥20.

For this project only vegetation zones with a VI score ≥20 require offsetting.

7.2 Credit calculations and classes

7.2.1 Ecosystem credits

The ecosystem credits required to offset the proposal are provided in **Table 7.1** and **Appendix E** (also refer vegetation mapping in **Figure 3.2** and **Figure 3.3**). A total of 275 ecosystem credits is required to offset the proposed development.

Table 7.1: Ecosystem credits summary and credit profiles.

PCT	Condition class	Credits required
PCT 103 Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion	Woodland	237
	Open woodland	36
	DNG	0
	Sub-total	**273**
PCT 105 Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion	Intact	2
	Sub-total	**2**
	Total ecosystem credits required	**275**

7.2.2 Species credits

A species polygon has been prepared Barking Owl and Masked Owl (**Figure 7.1** to **Figure 7.3**). Only the target survey for owls in the Project area (device # 09553) was deemed

to satisfy the survey requirements. Therefore, a 400 m buffer was created around the location of this device as an area where the owls could be considered absent.

A total of 244 *Ninox connivens* (Barking Owl) credits and three (3) *Tyto novaehollandiae* (Masked Owl) credits are required to offset the impact to habitat for these species (**Table 7.2**).

Table 7.2: Species credits summary and credit profiles.

Species	No. of species credits
Ninox connivens (Barking Owl)	244
Tyto novaehollandiae (Masked Owl)	3
Total	**247**

The following offset rules apply for like-for-like options for the species:

- *Ninox connivens* (Barking Owl) in any IBRA region in NSW.
- *Tyto novaehollandiae* (Masked Owl) in any IBRA region in NSW.

BAM-C reports are provided in **Appendix E**.



Figure 7.1: Species polygon for Barking Owl – Project area (Ecoplanning 2025).



Figure 7.2: Species polygon for Barking Owl – haul road north (Ecoplanning 2025).

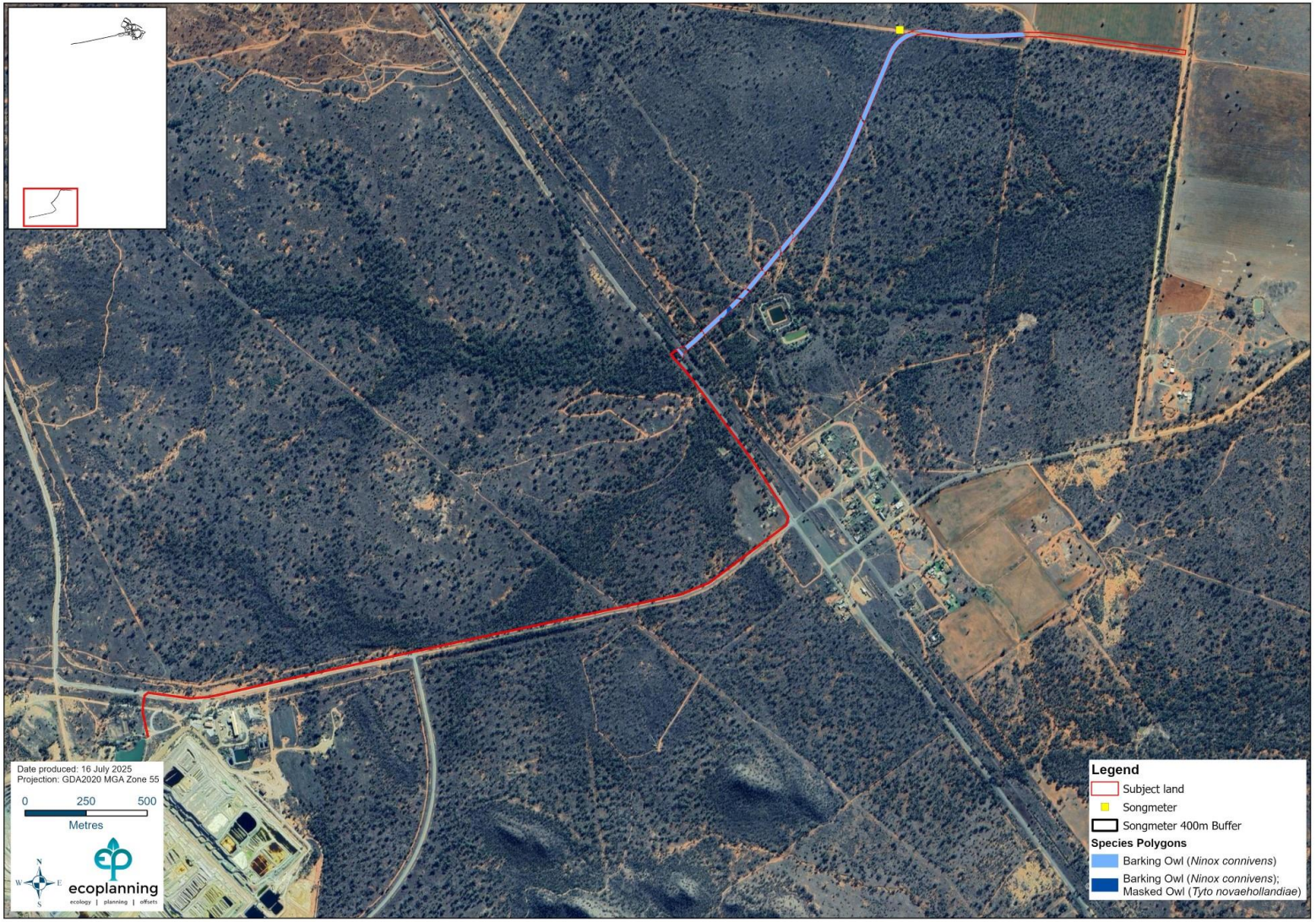


Figure 7.3: Species polygon Barking Owl and Masked Owl – haul road south (Ecoplanning 2025).

8 Conclusions and summary of the BDAR

This BDAR has been prepared in accordance with the BAM to assess the impacts to biodiversity values, including threatened species and their habitats, associated with the proposed Constellation project, Girilambone, NSW.

This BDAR has identified the landscape context of the subject land and a 1,500 m buffer around the subject land, in accordance with the BAM. The native vegetation within the subject land has been assessed including identification of the PCTs present across the subject land. Further, the vegetation condition has been mapped (vegetation zones) and VI scores have been assigned for each of the vegetation zones. No TECs have been identified on the subject land. The calculated VI scores are above the threshold for a vegetation community associated with threatened species habitat (i.e., ≥17/100) for most vegetation zones and thus the offset rules apply. Only PCT 103 in DNG condition had a VI score below 17, therefore, impacts to this vegetation zone does not require offsetting.

In accordance with the BAM, impacts to threatened flora and fauna species, including their habitats, have been considered and assessed. Candidate species predicted to occur were assessed in accordance with the BAM. No threatened flora species were observed or assumed to be present within the Project area and, therefore, were not considered in species credit calculations are. Area calculations have been used to calculate ecosystem credit offsets required only.

Twelve candidate fauna species were the subject of survey or an expert report. Of these species, potential suitable habitat Barking Owl (PCT 103 woodland and open woodland, and 105 intact) and Masked Owl (PCT 105 intact) was assumed present where survey was not conducted.

The significant impact criteria for MNES listed under the EPBC Act that are relevant to the subject land included Pink Cockatoo, Southern Whiteface and Corben's Long-eared Bat. These assessments concluded that a referral under the EPBC Act is recommended for Pink Cockatoo, given that the species was recorded within the subject land and potential breeding habitat is likely to be impacted by the proposed development.

The proposal will completely remove 97.53 ha of native vegetation from the subject land (184.91 ha). Measures to avoid and minimise impacts to biodiversity have been outlined in consideration of habitat features on the subject land. Additional measures to minimise impacts to biodiversity which are to be incorporated into the project have been proposed, including preparation of a CEMP to manage any direct and indirect impacts during the vegetation clearing and subsequent development works. Specific management plans addressing impacts to Pink Cockatoo and hollow bearing trees are also recommended.

The biodiversity offset requirement for residual impacts of the proposed development have been calculated and presented in accordance with Section 10 of the BAM. The Credit Payment Report generated from the BAM-C is included in this report. A total of 275 ecosystem credits, 224 Barking Owl credits and three (3) Masked Owl credits are required to offset residual impacts.

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Appendix A Plot data

Key: Highlighted rows denote plots undertaken prior to layout design change and, therefore, not included in this assessment

Plot No.	PCT	Area (ha)	Condition class	Zone	Easting	Northing	Bearing
BAM-C-01	103	1	Woodland	55	498133	6560651	330
BAM-C-02	103	1	Woodland	55	498646	6560920	251
BAM-C-03	103	1	DNG	55	498072	6560854	67
BAM-C-04	103	1	DNG	55	499135	6561199	83
BAM-C-05	103	1	DNG	55	498137	6561301	74
BAM-C-06	103	1	DNG	55	498399	6561127	155
BAM-C-07	103	1	Woodland	55	498577	6561181	85
BAM-01	103	1	Woodland	55	490766	6544333	45
BAM-02	103	1	Open Woodland	55	489594	6557745	336
BAM-07	103	1	Open Woodland	55	492216	6547736	246
BAM-30	103	1	DNG	55	492541	6559481	69
BAM-31	103	1	DNG	55	492686	6559478	60
BAM-33	105	1	Intact	55	489658	6557438	162
BAM-34	103	1	Open woodland	55	489681	6556344	168
BAM-36	105	1	Intact	55	491949	6550082	36
BAM-37	105	1	Intact	55	492158	6549505	164

Plot No.	Composition					
	Tree	Shrub	Grass	Forb	Fern	Other
BAM-C-01	2	8	11	20	1	3
BAM-C-03	0	2	6	20	0	2
BAM-C-04	1	2	3	16	0	2
BAM-C-05	0	4	3	14	0	0
BAM-C-06	0	3	7	16	0	1
BAM-01	2	8	7	16	0	2
BAM-02	0	6	11	14	1	2
BAM-07	2	7	8	18	1	1
BAM-30	1	3	6	7	0	0
BAM-33	3	6	9	9	0	1

Plot No.	Structure					
	Tree	Shrub	Grass	Forb	Fern	Other
BAM-C-01	10.5	6.7	41.4	18.1	0.1	0.7
BAM-C-03	0	0.2	21.4	19.2	0	0.2
BAM-C-04	1	10.2	5.3	29.2	0	0.2
BAM-C-05	0	0.8	0.6	51.8	0	0
BAM-C-06	0	0.4	21.1	19	0	0.2
BAM-01	8	10.3	35.9	9.1	0	0.2
BAM-02	3	1.8	43.8	4.8	0.1	0.2
BAM-07	15	12.1	43.4	2.7	0.1	0.1
BAM-30	0.1	0.4	0.9	10.6	0	0
BAM-33	4.1	5.5	49.5	1.3	0	0.1

Plot No.	Function								
	Large trees (>30cm DBH)	Hollow trees	Litter cover (%)	Fallen logs (m)	Tree stem 5-10 cm	Tree stem 10-20 cm	Tree stem 20-30 cm	Tree regen	High threat exotic
BAM-C-01	0	0	15	10	2	1	2	0	0
BAM-C-03	0	0	1.6	0	0	0	0	0	0
BAM-C-04	0	0	3	0	0	1	0	0	0.1
BAM-C-05	0	0	3	0	0	0	0	0	0.1
BAM-C-06	0	0	6	0	0	0	0	0	0.1
BAM-01	1	0	24	9	0	1	1	0	0
BAM-02	0	0	12.6	14	1	0	1	1	0
BAM-07	0	0	37	26	0	1	1	2	0
BAM-30	0	0	13.4	0	0	0	0	0	0
BAM-33	3	1	39	20	1	1	0	0	0

Plot Data – Flora records

'-C' indicates plots at the Project area (Constellation site), other plots are along the infrastructure corridor options. Highlighted columns indicate plots that were undertaken prior to layout design change and, therefore, not included in this assessment.

Family	Scientific name	Common name	Plots										
			01-C	03-C	04-C	05-C	06-C	01	02	07	30	33	Incident.
Acanthaceae	*Brunoniella australis*	Blue Trumpet	0.1					0.1		0.1		0.1	
	Rostellularia adscendens	Pink Tongues											X
Amaranthaceae	*Alternanthera* sp.	Joyweed						0.1					
	Ptilotus spathulatus	Pussytails									0.1		
Apiaceae	*Daucus glochidiatus*	Native Carrot	0.1		0.1	0.1			0.1				
Asparagaceae	*Arthropodium minus*												X
Asphodelaceae	*Bulbine semibarbata*	Wild Onion			0.1	0.1	0.1		0.1				
Asteraceae	*Actinobole uliginosum*	Flannel Cudweed								0.1			
	*Arctotheca calendula**	Capeweed					0.1						
	Calotis cuneata	Mountain Burr-Daisy	10			0.2							
	Calotis cuneifolia	Purple Burr-Daisy			0.5		0.2	2		0.5			
	Calotis hispidula	Bogan Flea		1	0.2	0.1	1		0.5				
	Calotis lappulacea	Yellow Burr-daisy		5	20	30	5	3	2	0.2		0.5	
	Calotis sp.										10		
	Carthamus lanatus*	Saffron Thistle			0.1	0.1	0.1						
	*Centaurea melitensis**	Cockspur Thistle											X

Family	Scientific name	Common name	Plots										
			01-C	03-C	04-C	05-C	06-C	01	02	07	30	33	Incident.
	Centaurea sp.*	Thistle	0.1		1	0.1	0.1						
	Centipeda sp.												X
	Chrysocephalum apiculatum												X
	Conyza sp.*	A Fleabane	0.1		0.1	0.1						0.1	
	Euchiton sphaericus	Star Cudweed	0.1										
	Euchiton spp.										0.1		
	*Hypochaeris radicata**	Catsear			0.1		0.1		0.1				
	Leiocarpa sp.		0.1										
	Leontodon rhagadioloides	Cretan Weed	0.1			0.1							
	Rhodanthe floribunda	Common White Sunray		5	0.5	20	3						
	Rhodanthe pygmaea	Pigmy Sunray											
	Sigesbeckia sp.											0.1	
	*Sonchus oleraceus**	Common Sowthistle	0.1	0.1	0.2		0.1	0.1	0.1				
	Stuartina muelleri	Spoon Cudweed	0.1		0.1	0.1							
	Triptilodiscus pygmaeus	Common Sunray	0.1	0.1									
	Vittadinia dissecta	Fuzzweed								0.1			
	Vittadinia sp.			0.1				0.1		0.1	0.1	0.1	
	Xanthium occidentale*	Noogoora Burr											
	Xerochrysum bracteatum	Golden Everlasting	0.1	0.1		0.1	0.1						

Family	Scientific name	Common name	Plots										
			01-C	03-C	04-C	05-C	06-C	01	02	07	30	33	Incident.
Boraginaceae	*Echium plantagineum**	Patterson's Curse			0.1								
Brassicaceae	*Harmsiodoxa blennodioides*			0.5	5	0.5	2	0.1	1	0.1			
	Lepidium africanum										0.1		
	Lepidium sp.	A Peppercress							0.1				
	*Sisymbrium irio**	London Rocket	0.5										
	*Sisymbrium orientale**	Indian Hedge Mustard	0.2		1	0.2							
	Sisymbrium sp.*								0.5				
Campanulaceae	*Wahlenbergia communis*	Tufted Bluebell	0.1										
	Wahlenbergia sp.	Bluebell		0.1	0.1	0.1	0.2						
Caryophyllaceae	*Polycarpon tetraphyllum**	Four-leaved Allseed											X
Chenopodiaceae	*Atriplex* spp.										0.1		
	Chenopodium desertorum	Desert Goosefoot	0.1										
	Chenopodium sp.	Goosefoot, Crumbweed						1					
	Dysphania sp.		0.2	0.1									
	Einadia nutans	Climbing Saltbush	0.1					0.2		0.1		0.1	
	Einadia trigonos	Fishweed						0.1					
	Enchylaena tomentosa											0.1	
	Maireana enchylaenoides	Wingless Fissure-weed											X
	Maireana humillima												X

Family	Scientific name	Common name	Plots										
			01-C	03-C	04-C	05-C	06-C	01	02	07	30	33	Incident.
	Sclerolaena anisacanthoides	Yellow Burr											X
	Sclerolaena bicornis	Goathead Burr											X
	Sclerolaena birchii	Galvanised Burr	0.2	0.1	10	0.5	0.2		0.2		0.2	0.1	
	Sclerolaena convexula	Tall Copperburr	0.1		0.2	0.1	0.1			0.2			
	Sclerolaena cuneata			0.1									
	Sclerolaena diacantha	Grey Copperburr						2	0.2			0.1	
	Sclerolaena muricata var. *villosa*	Black Rolypoly				0.1							
	Sclerolaena sp.							0.1			0.1	0.1	
Convolvulaceae	*Convolvulus angustissimus*												X
	Convolvulus remotus							0.1	0.1				
	Convolvulus sp.	A Bindweed									0.1		
	Dichondra repens	Kidney Weed											
Crassulaceae	*Crassula* sp.	Stonecrop	0.1	0.2	0.1	0.1	1	0.5	0.1				
Cucurbitaceae	*Cucumis myriocarpus**	Paddy Melon											X
Cupressaceae	*Callitris glaucophylla*	White Cypress Pine							3	5		1	
Euphorbiaceae	*Euphorbia dallachyana*	Mat Spurge										0.1	
	Euphorbia drummondii	Caustic Weed	0.1	0.1						0.1			
Fabaceae (Mimosoideae)	*Acacia burrowii*	Burrow's wattle									0.1		

Family	Scientific name	Common name	Plots										
			01-C	03-C	04-C	05-C	06-C	01	02	07	30	33	Incident.
Fabaceae (Caesalpinioideae)	*Senna artemisioides* subsp. *X artemisioides*												X
Fabaceae (Faboideae)	*Grona varians*	Slender Tick-trefoil	0.1										
	Glycine canescens	Silky Glycine	0.5	0.1	0.1		0.2						
	Glycine sp.							0.1	0.1	0.1		0.1	
	*Medicago laciniata**	Cut-leaved Medic						0.1	0.2				
	Medicago sp.*		0.1		50	30	20						
	*Medicago truncatula**	Barrel Medic		0.5									
	*Trifolium glomeratum**	Clustered Clover											X
	Trifolium sp.*	A Clover							0.1				
Gentianaceae	*Centaurium* sp.*		0.1										
Geraniaceae	*Erodium crinitum*	Blue Crowfoot	0.5	0.2	2	0.2	5	0.5	0.2	0.1			
Goodeniaceae	*Goodenia cycloptera*	Cut-leaf Goodenia	0.1	0.1		0.1	0.5	0.1	0.1	0.1			
	Goodenia glabra	Smooth Goodenia						0.1		0.1			
Lamiaceae	*Stachys arvensis**	Stagger Weed				0.2							
Malvaceae	*Abutilon otocarpum*	Desert Lantern	0.1			0.1		0.1	0.1				
	Abutilon oxycarpum	Lantern Bush											X
	Abutilon sp.						0.1			0.1		0.1	
	Brachychiton populneus	Kurrajong										3	
	*Malva parviflora**	Small-flowered Mallow	0.1									0.1	

Family	Scientific name	Common name	Plots										
			01-C	03-C	04-C	05-C	06-C	01	02	07	30	33	Incident.
	*Malvastrum americanum**	Spiked Malvastrum				0.1							
	Sida corrugata	Corrugated Sida	0.1	0.1	0.1		0.1	0.1					
	Sida cunninghamii	Ridge Sida		0.1	0.1		0.1	0.1		0.1	0.1	0.1	
	Sida sp.		0.1			0.1	0.5	0.1	0.2				
Myoporaceae	*Eremophila longifolia*	Emubush	1						1				
	Eremophila mitchellii	Budda						1		10			
	Eremophila sturtii	Narrow-leaf Emu-bush											X
	Myoporum montanum	Western Boobialla						0.1					
Myrtaceae	*Eucalyptus intertexta*	Gum Coolibah			1			3	5				
	Eucalyptus populnea subsp. *bimbil*	Bimble Box	10					10	3	10		0.1	
Nyctaginaceae	*Boerhavia dominii*	Tarvine									0.1	0.1	
Orchidaceae	*Caladenia* sp.												
Oxalidaceae	*Oxalis* sp.							0.1		0.1			
Phormiaceae	*Dianella* sp.												X
Plantaginaceae	*Plantago* sp.	Plantain	0.1	0.2	0.1	0.1	0.1		0.1				
Poaceae	*Anthosachne scabra*	Wheatgrass, Common Wheatgrass	0.1		0.1							60	
	Aristida behriana	Bunch Wiregrass											X
	Aristida gracilipes	Three-awn Speargrass		0.1									
	Aristida jerichoensis	Jericho Wiregrass					10	0.1	0.1				

Family	Scientific name	Common name	Plots									
			01-C	03-C	04-C	05-C	06-C	01	02	07	30	33	Incident.
	Aristida personata		0.2										
	Aristida sp.	A Wiregrass	0.1	0.2	0.2	0.1	0.2					0.2	
	Austrostipa scabra	Speargrass	20	20	0.5	0.5	10	30	20	30	0.2	40	
	Austrostipa setacea	Corkscrew Grass											X
	Austrostipa sp.	A Speargrass							20				
	Avena sp.*	Oats	0.1								0.2		
	Bothriochloa macra	Red Grass											X
	Chloris truncata	Windmill Grass							0.1		0.2	1	
	Chloris ventricosa	Tall Chloris	0.2					0.5				0.2	
	Cymbopogon refractus	Barbed Wire Grass											X
	Dichanthium sericeum	Queensland Bluegrass											X
	Digitaria brownii	Cotton Panic Grass							0.1				
	Digitaria divaricatissima	Umbrella Grass							0.1				
	Enneapogon nigricans						0.1		0.1			1	
	Enteropogon acicularis	Curly Windmill Grass	10			5	0.5						
	Eragrostis brownii	Brown's Lovegrass											X
	Eragrostis lacunaria	Purple Lovegrass					0.5			0.5			
	Eragrostis parviflora	Weeping Lovegrass	0.5	0.5								0.1	
	Eragrostis sp.	A Lovegrass						0.1	0.1		0.1		
	Hordeum sp.*	A Barley Grass	0.1										

Family	Scientific name	Common name	Plots										
			01-C	03-C	04-C	05-C	06-C	01	02	07	30	33	Incident.
	Monachather paradoxus	Bandicoot Grass											X
	Panicum effusum	Hairy Panic						0.5	0.1	0.1			
	Panicum sp.	Panicum								0.5	0.2	5	
	Paspalidium constrictum	Knottybutt Grass	0.1					5	2	10	0.2	1	
	Rytidosperma sp.												X
	Themeda triandra	Kangaroo Grass	10									1	
	Thyridolepis mitchelliana	Mulga Mitchell's Grass			0.1								
	Tripogon loliiformis	Fiveminute Grass	0.1						0.1	0.1		5	
	Walwhalleya subxerophila	Gilgai Grass											X
Primulaceae	*Lysimachia arvensis**	Scarlet Pimpernel	1		0.2	0.2	0.2	0.5		0.1			
Pteridaceae	*Cheilanthes sieberi*	Rock Fern	0.1						0.1	0.1			
Rhamnaceae	*Ventilago viminalis*	Supple Jack	0.5										
Rubiaceae	*Asperula* sp.	Woodruff	0.1										
Rutaceae	*Flindersia maculosa*	Leopardwood											X
	Geijera parviflora	Wilga	5					5	0.2	1		5	
Sapindaceae	*Atalaya hemiglauca*	Whitewood											X
	Dodonaea viscosa	Sticky Hop-bush	0.1							0.1		0.1	
Scrophulariaceae	*Misopates orontium**	Lesser Snapdragon											X
Solanaceae	*Solanum esuriale*	Quena											X

Family	Scientific name	Common name	Plots										
			01-C	03-C	04-C	05-C	06-C	01	02	07	30	33	Incident.
	Solanum ferocissimum	Spiny Potato-bush	0.1					0.1		0.2			
	*Solanum nigrum**	Black-berry Nightshade											X
	Solanum sp.										0.1	0.1	
Stackhousiaceae	*Stackhousia* sp.		0.1							0.1			
Urticaceae	*Parietaria* sp.												X
Verbenaceae	*Verbena* sp.				0.1								

Key; '*' Denotes exotic species. Bold denotes high threat exotic species

Appendix B Fauna species list

Class	Family	Scientific name	Common name	Native/Exotic	Observation Type
Aves	Acanthizidae	*Acanthiza uropygialis*	Chestnut-rumped Thornbill	Native	O
		Smicrornis brevirostris	Weebill	Native	O
		Acanthiza chrysorrhoa	Yellow-rumped Thornbill	Native	O
		Aphelocephala leucopsis	Southern Whiteface	Native	OW
		Acanthiza nana	Yellow Thornbill	Native	O
	Accipitridae	*Elanus axillaris*	Black-shouldered Kite	Native	O
		Circus assimilis	Spotted Harrier	Native	OW
		Milvus migrans	Black Kite	Native	O
	Alcedinidae	*Todiramphus sanctus*	Sacred Kingfisher	Native	O
		Dacelo novaeguineae	Laughing Kookaburra	Native	OW
	Anatidae	*Anas gracilis*	Grey Teal	Native	O
		Anas superciliosa	Pacific Black Duck	Native	O
		Malacorhynchus membranaceus	Pink-eared Duck	Native	O
	Artamidae	*Cracticus nigrogularis*	Pied Butcherbird	Native	OW
		Cracticus tibicen	Australian Magpie	Native	OW
		Cracticus torquatus	Grey Butcherbird	Native	OW
	Cacatuidae	*Cacatua sanguinea*	Little Corella	Native	W
		Lophochroa leadbeateri	Pink Cockatoo	Native	OW
		Eolophus roseicapillus	Galah	Native	OW

Class	Family	Scientific name	Common name	Native/Exotic	Observation Type
		Nymphicus hollandicus	Cockatiel	Native	OW
	Campephagidae	*Lalage sueurii*	White-winged Triller	Native	OW
		Coracina novaehollandiae	Black-faced Cuckoo-shrike	Native	O
	Casuariidae	*Dromaius novaehollandiae*	Emu	Native	O
	Columbidae	*Ocyphaps lophotes*	Crested Pigeon	Native	OW
		Phaps chalcoptera	Common Bronzewing	Native	OW
		Geopelia striata	Peaceful Dove	Native	O
		Geopelia humeralis	Bar-shouldered Dove	Native	O
	Corcoracidae	*Struthidea cinerea*	Apostlebird	Native	OW
		Corcorax melanorhamphos	White-winged Chough	Native	OW
	Corvidae	*Corvus mellori*	Little Raven	Native	OW
	Cuculidae	*Chalcites basalis*	Horsfield's Bronze-Cuckoo	Native	OW
		Cacomantis flabelliformis	Fan-tailed Cuckoo	Native	OW
	Falconidae	*Falco cenchroides*	Nankeen Kestrel	Native	O
	Hirundinidae	*Petrochelidon nigricans*	Tree Martin	Native	O
	Maluridae	*Malurus splendens*	Splendid Fairy-wren	Native	OW
	Megaluridae	*Cincloramphus mathewsi*	Rufous Songlark	Native	OW
		Cincloramphus cruralis	Brown Songlark	Native	OW
	Meliphagidae	*Acanthagenys rufogularis*	Spiny-cheeked Honeyeater	Native	O
		Plectorhyncha lanceolata	Striped Honeyeater	Native	O
		Gavicalis virescens	Singing Honeyeater	Native	OW

Class	Family	Scientific name	Common name	Native/Exotic	Observation Type
		Manorina melanocephala	Noisy Miner	Native	OW
		Ptilotula penicillatus	White-plumed Honeyeater	Native	O
	Meropidae	*Merops ornatus*	Rainbow Bee-eater	Native	O
	Monarchidae	*Myiagra inquieta*	Restless Flycatcher	Native	OW
		Grallina cyanoleuca	Magpie-lark	Native	OW
	Pachycephalidae	*Colluricincla harmonica*	Grey Shrike-thrush	Native	OW
		Oreoica gutturalis	Crested Bellbird	Native	OW
	Pardalotidae	*Pardalotus striatus*	Striated Pardalote	Native	O
	Passerine	*Dicaeum hirundinaceum*	Mistletoebird	Native	O
	Pelecanidae	*Pelecanus conspicillatus*	Australian Pelican	Native	O
	Petroicidae	*Petroica goodenovii*	Red-capped Robin	Native	O
	Phalacrocoracidae	*Phalacrocorax sulcirostris*	Little Black Cormorant	Native	O
	Podicipedidae	*Tachybaptus novaehollandiae*	Australasian Grebe	Native	O
	Pomatostomidae	*Pomatostomus temporalis*	Grey-crowned Babbler (eastern subspecies)	Native	OW
	Psittacidae	*Barnardius zonarius*	Australian Ringneck	Native	OW
		Northiella haematogaster	Blue Bonnet	Native	OW
		Melopsittacus undulatus	Budgerigar	Native	OW
		Aprosmictus erythropterus	Red-winged Parrot	Native	O
		Psephotus haematonotus	Red-rumped Parrot	Native	OW
		Psephotus varius	Mulga Parrot	Native	OW
	Ptilonorhynchidae	*Chlamydera maculata*	Spotted bowerbird	Native	W

Class	Family	Scientific name	Common name	Native/Exotic	Observation Type
Mammalia	Bovidae	*Capra hircus*	Goat	Exotic	OW
	Leporidae	*Oryctolagus cuniculus*	Rabbit	Exotic	O
	Macropodidae	*Macropus rufus*	Red Kangaroo	Native	O
	Suidae	*Sus scrofa*	Pig	Exotic	O
Reptilia	Agamidae	*Pogona barbata*	Bearded Dragon	Native	O
	Elapidae	*Pseudechis australis*	King Brown Snake	Native	O
	Pythonidae	*Morelia spilota metcalfei*	Murray/Darling Carpet Python	Native	O
	Varanidae	*Varanus varius*	Lace Monitor	Native	O
Amphibia	Hylidae	*Cyclorana platycephala*	Water-holding Frog	Native	W
		Litoria caerulea	Green Tree Frog	Native	W
		Litoria latopalmata	Broad-palmed Frog	Native	W
		Litoria peronii	Peron's Tree Frog	Native	W
		Litoria rubella	Desert Tree Frog	Native	W
	Myobatrachidae	*Crinia parinsignifera*	Eastern Sign-bearing Froglet	Native	W
		Crinia signifera	Common Eastern Froglet	Native	W
		Limnodynastes dumerilii	Eastern Banjo Frog	Native	W
		Limnodynastes fletcheri	Long-thumbed Frog	Native	W
		Limnodynastes interioris	Giant Banjo Frog	Native	W
		Limnodynastes tasmaniensis	Spotted Grass Frog	Native	W
		Notaden bennettii	Crucifix Frog	Native	W
		Platyplectrum ornatum	Ornate Burrowing Frog	Native	W

O = observed, W = heard, highlighted = threatened species

Appendix C EPBC Significance Assessments

Pink Cockatoo (Lophochroa leadbeateri) – endangered species

The eastern Pink Cockatoo is a small, white and pink cockatoo with a long, forward pointing, scarlet and yellow-banded crest. Birds are mostly white, with washed salmon pink on sides of the head and grading to white on the lower belly. The crest appears white when folded and shows broad red and yellow bands through the centre when raised and spread (Commonwealth DCCEEW 2023a). The population of the eastern Pink Cockatoos was estimated (with low reliability) to be 15,000 mature individuals in 2011, and a density of 1 pair per 30 km2 (Garnett et al. 2011). There are no more recent estimates. This is a significant decrease to the estimated 50,000 mature individuals in 2000 (Garnett and Crowley 2000). The longevity and generation period (three generations of 65.7 years; Bird et al. 2020) means that population decline estimates will need to encompass losses in the 1950s and 60s when there was no monitoring of this species. Most land-use intensification occurred in western New South Wales in the late 19th century (Lunney 2001) and north-west Victoria from 1920 to 1940 (Fahey 2017), but legacy effects would have likely resulted in ongoing losses.

This species occurs in the Murray-Darling, Eyre and Bulloo River basins, from Isisford and Roma in the north, through western New South Wales to north-west Victoria and west to eastern South Australia (Higgins 1999). Pink Cockatoos inhabit a wide range of plant communities, mostly in arid and semi-arid woodlands and always within easy reach of surface water. This species nests occur in very old trees in large hollows, which take a long time to form. Breeding pairs have a relatively large home range (30 km^2) and do not nest near other Pink Cockatoos. The main current threat to this species is the loss and consequent cumulative and increasing shortage of nesting hollows (Hurley and Garnett 2021), due to vegetation clearing, drought or wildfire. Under the changing climate, longer droughts (Evans et al. 2017), more frequent heatwaves (Herold et al. 2018), and more extreme fire weather are expected to increase in the near future, which will increase the risk of individual survival and further habitat loss and degradation.

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat.

Threats to this species include:

- Habitat loss and degradation
- Loss of large hollow-bearing trees
- Climate change.

An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of a population*

There EPBC Act Protected Matters Seach Tool (PMST) identifies the presence of this species within 25 km of the study area (**Appendix G**). The species was observed by Ecoplanning on approximately four occasions within the subject land and flying overhead during diurnal survey in 2022.

Populations important to the survival of the Pink Cockatoo include stronghold populations, ecologically or genetically distinct populations (e.g., those at the limits of the subspecies' range, outlying populations), research populations, and other populations where recovery actions are being implemented (Commonwealth DCCEEW 2023a). The conservation advice for Pink Cockatoo (Commonwealth DCCEEW 2023a) does not list any known important populations.

The Pink Cockatoo is a highly mobile species, with breeding pairs occupying home ranges extending up to 30 km^2 which span over seasonally variable resources of food (Commonwealth DCCEEW 2023a). The habitat within the subject land is part of a vegetation patch of approximately >100 ha in size, with viable breeding and foraging habitat present outside of the subject land.

Given that native vegetation surrounding the subject land is already fragmented to some extent by roads and agriculture, and that the Pink Cockatoo is a highly mobile avian species, the potential for the proposal to substantially fragment existing populations of this species is low. There are no known significant populations of this species within the locality. Habitat for this species impacted is restricted to the proposed infrastructure corridor (**Figure 1.1**, **Figure 1.2** and **Figure 1.3**). The haul road was initially designed as a 50 m wide corridor, but that has been revised to 18 m and use existing road disturbance where possible to further limit biodiversity impacts (**Section 6.6**).

Nevertheless, the proposed activity will result in the removal of approximately 10.11 ha of foraging and 48 hollow-bearing trees, which are potential breeding habitat. Inspections inside tree hollows have not been undertaken to determine if the internal size of the hollow is ideal for nesting of this species, so it is noted that it is unlikely that all HBT's being impacted constitute breeding habitat for this species (living or dead tree with hollows greater than 10 cm diameter). The corridor width allowing dispersal of the species to the east and west will be reduced by 18 m, therefore, the ability of the species to move throughout their large home range will be maintained.

Despite the loss of foraging and potential breeding habitat, the proposed development is not likely to lead to a long-term decrease in the size of an important population of a species.

- *reduce the area of occupancy of the species*

The proposal would result in the removal of 10.11 ha of habitat. It is unlikely that this will significantly reduce the area of occupancy of an important population of Pink Cockatoo, as they are a highly mobile avian species requiring large areas of habitat with home ranges extending up to 30 km^2. Additional foraging and breeding habitat will remain for this species in native vegetation to the north, south and west of the study area. Therefore, the proposal is unlikely to significantly reduce the area of occupancy of this species.

- *fragment an existing population into two or more populations*

Given that the habitat impacted by the proposed activity is restricted to the infrastructure corridor (**Figure 1.1**, **Figure 1.2** and **Figure 1.3**), only an 18 m reduction in the width of a potential movement corridor will occur, which is unlikely to fragment an existing population of Pink Cockatoo's.

- *adversely affect habitat critical to the survival of a species*

Habitat critical to the survival of the Pink Cockatoo includes all foraging habitat during both the breeding and non-breeding season. This species inhabits a wide range of plant communities, mostly in arid and semi-arid woodlands dominated by *Acacia aneura*, mallee and box eucalypts within easy reach of surface water. A surrounding matrix of these areas is critical in providing movement corridors for dispersal across the landscape, which has been identified as critical to the survival of this species (Commonwealth DCCEEW 2023a).

This species relies on stands of suitable hollow-bearing trees which are a key component of their breeding habitat. Habitat critical to the survival includes hollow bearing trees with known or potential hollow chambers that are greater than 10 cm in diameter, with an average depth of 53.9 cm deep (range 19–180 cm) and occur in trees with a diameter at breast height of 72.5 cm (range 34-149 cm) (Commonwealth DCCEEW 2023a).

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat. However, the current proposal would result in the removal of 10.11 ha of vegetation that represents foraging habitat and potential breeding habitat will be removed in the form of 48 hollow-bearing trees. As such, removal of habitat within the subject land may adversely affect habitat critical to the survival of the species.

- *disrupt the breeding cycle of a population*

Breeding pairs usually nest in the same area each season and stay together throughout the year. The clutch size is usually three or four eggs, laid in August or September, and typically one or two chicks are fledged from each nest (Commonwealth DCCEEW 2023a). A decline in this species area of occupancy and quality of habitat is evident from the ongoing loss and degradation of breeding habitat (Commonwealth DCCEEW 2023a). Given that breeding pairs of this species have a relatively large home range (30 km^2) and do not nest near other Pink Cockatoos, the availability of hollow-bearing trees throughout their range is likely critical to successful breeding cycles.

The species was observed by Ecoplanning on four occasions within the subject land or flying overhead during diurnal survey in 2022. No individuals or pairs were observed displaying breeding behaviour on any occasions, including during the survey period for this species.

Potential breeding habitat trees will be removed in the form of 48 hollow-bearing trees. Despite the likelihood that having hollow bearing tees throughout their range is likely to be important to maintain breeding success, the lack of detecting a known nest tree and their documented nest fidelity suggests that the proposal is not going to impact the breeding cycle of the species. In addition, the proposal infrastructure corridor has been reduced to limit the number of hollow bearing trees removed.

- *modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The current proposal would result in the removal of 10.11 ha of vegetation that represents foraging and potential breeding habitat in the form of 48 hollow-bearing trees. Despite this loss, it is unlikely that the proposal may cause the local Pink Cockatoo population to decline.

- *result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat*

The proposed works are unlikely to result in invasive species that is harmful to the local occurrence of this species.

- *introduce disease that may cause the species to decline, or*

It is unlikely that the proposed action would introduce disease that may cause the species to decline. The proposed works would not cause a new disease to be introduced into the population.

- *interfere substantially with the recovery of the species.*

The proposal is not likely to substantially interfere with the recovery of the species despite the area of vegetation and potential breeding habitat that will be removed. Comparatively large areas of habitat remain within the region, so the relative impact of the proposed works on the recovery of the species is not likely to be substantial. There are no known significant populations of this species within the locality. Habitat for this species impacted is restricted to the proposed infrastructure corridor (**Figure 1.1**, **Figure 1.2** and **Figure 1.3**). The haul road was initially designed as a 50 m wide corridor, but that has been revised to 18 m to further limit biodiversity impacts (**Section 6.6**).

Conclusion of the EPBC Act Significant Impact Criteria Guidelines (DotE 2013) for Pink Cockatoo

- Pink Cockatoo was observed in the subject land and adjoining areas or flying over the site on four occasions.
- 10.11 ha of habitat will be impacted, which includes foraging and potential breeding sites
- no known nest trees were identified in the subject land or adjoining area.
- the proposal will remove 48 hollow bearing trees, which could be potential nest trees
- foraging and breeding habitat is considered critical for the species
- the proposed activity will not significantly increase the distance between vegetation on either side of the infrastructure corridor, however, the removal of habitat within the subject land may adversely the matrix of available habitat for this species.

On the basis of the impact to the Pink Cockatoo foraging habitat and removal of 48 hollow bearing trees, it is recommended that the Project is referred to the Commonwealth Minister.

Southern Whiteface (Aphelocephala leucopsis leucopsis) – vulnerable species

The Southern Whiteface (family Acanthizidae) is a small, stocky thornbill-like bird with a brown dorsum, white belly, dark brown wings and a black tail with narrow white tip (Schodde and Mason 1999). The Southern Whiteface occurs across most of mainland Australia south of the tropics, from the northeastern edge of the Western Australian wheatbelt, east to the Great Dividing Range (Schodde and Mason 1999). Although this assessment considers Southern Whiteface at the species level, two subspecies are recognised, however, only *Aphelocephala leucopsis leucopsis* (South-east Southern Whiteface) is the only subspecies present in NSW,

found throughout south-eastern and central Australia. There are currently estimated to be 477,000 (range 236,000–954,000) mature individuals in the wild, with the extent of occurrence (EOO) for the species is estimated to be 4,910,000 km^2 (Commonwealth DCCEEW 2023b).

Southern Whiteface occupies a wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both. These areas are usually in habitats dominated by acacias or eucalypts on ranges, foothills and lowlands, and plains (Higgins and Peter 2002). Breeding takes place from July to October throughout most of the species' range, however, the timing of breeding can be affected by rainfall in arid regions (Higgins and Peter 2002). Birds may breed outside of their usual season following sufficient rainfall, or may not breed at all during drought. Birds build large bulky domed nest of grass, bark and roots, usually in a hollow or crevice, although sometimes in low bushes (Higgins and Peter 2002). Southern Whitefaces are considered sedentary; however, records indicate that individuals may move into wetter areas outside of their normal range during drought years. In NSW, the population is considered stable in the centre of its range, however, there have been a slow decline in populations and contractions along the eastern margins of its range. The subject land is not near the eastern margin of its range.

Important populations of the species have not been identified (Commonwealth DCCEEW 2023).

Threats to this species include:

- Habitat loss and degradation
- Fragmentation
- Predation from invasive species
- Invasive weeds.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population of a species*

There EPBC Act Protected Matters Seach Tool (PMST) identifies the presence of this species within 25 km of the study area (**Appendix G**). The species was observed by Ecoplanning within the subject land during survey in 2022. There are no known important populations of this species within the region.

The study area contains eucalypt species, such as *Eucalyptus populnea* and *Eucalyptus intertexta,* which may provide potential foraging habitat for the species. Southern Whiteface was recorded on one occasion within the subject land during field survey. Given the slivers of habitat that will be removed within the infrastructure corridor, and habitat around the Project area, it is unlikely to affect the life cycle of the species such that the life cycle of a viable population will be placed at risk of extinction.

- *reduce the area of occupancy of an important population*

In NSW, Southern Whiteface occupies a wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both. These areas are usually in habitats dominated by acacias or eucalypts on ranges, foothills and lowlands, and plains. Southern

Whiteface was observed within the subject land during the survey period. No individuals or pairs were observed displaying breeding or nesting behaviour during the survey period.

The proposal will involve the removal of 10.11 ha of foraging habitat for this species. Additional foraging habitat will remain for this species in bushland to the north, south and west of the study area. Therefore, the proposal is unlikely to significantly reduce the area of occupancy of this species.

- *fragment an existing population into two or more populations*

Given that native vegetation within the locality is already fragmented by roads and agriculture, and that Southern Whiteface is a highly mobile avian species, the potential for the proposed activity to substantially fragment existing populations of this species is low. There are no known important populations of this species within the region. The 10.11 ha of vegetation proposed for removal within the subject land occurs within fragmented and unfragmented landscape, where a large amount of native vegetation has been avoided and will be retained (**Section 6.6**). The proposal is not likely to fragment an important population into two or more populations.

- *adversely affect habitat critical to the survival of a species*

Habitat critical to the survival of Southern Whiteface includes all foraging habitat during both the breeding (July to October) and non-breeding season.

Southern Whiteface has a broad distribution throughout south and central-eastern New South Wales, capable of foraging in a range of open eucalypt forests and woodlands, with preference to native tree and shrub seedlings and grassy woodland groundcover species. The subject land is largely dominated *Eucalyptus populnea* and *Eucalyptus intertexta* which represents foraging habitat. Approximately 10.11 ha of potential foraging habitat will be impacted by the proposal.

Habitat critical to the survival includes trees with hollows or crevices, however, this species is also known to build nests in low bushes (Higgins and Peter 2002). The subject land contains 48 hollow-bearing trees which can be considered potential nesting trees for Southern Whiteface. However, inspections inside tree hollows have not been undertaken to determine if the internal size of the hollow is ideal for nesting. A preclearing survey by an ecologist is recommended prior to tree clearing to identify nest trees so that appropriate precautions can be implemented to allow a breeding event to be completed. The 10.11 ha of potential foraging and breeding habitat proposed for removal within the subject land occurs within fragmented and unfragmented landscape, where a large amount of native vegetation has been avoided and will be retained (**Section 6.6**).

- *disrupt the breeding cycle of an important population*

Habitat critical to the breeding cycle of this species includes trees with hollows or crevices, however, this species is also known to build nests in low bushes (Higgins and Peter 2002). The subject land contains 48 hollow-bearing trees which can be considered potential nesting trees for Southern Whiteface during its breeding period (July to October), however, there are no known important populations of this species in the locality.

Given the wide distribution of this species and the presence of suitable nesting and foraging habitat outside the subject land, the proposal is unlikely to significantly disrupt the breeding cycle of a population of this species.

As a precaution, if construction works are to occur during the breeding period, a qualified ecologist should inspect the HBTs onsite for nesting Southern Whiteface as noise pollution and clearing of adjacent vegetation may pose a risk to their breeding cycle (**Section 6.6.1**).

- *modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

Within the subject land, 10.11 ha of native vegetation which contains suitable nesting and foraging habitat for Southern Whiteface will be impacted by the proposed development. The vegetation proposed for removal within the subject land occurs within fragmented and unfragmented landscape, where a large amount of native vegetation has been avoided and will be retained (**Section 6.6**). The proposed development will lead to an increase in human activity in the area of the proposed haul road and site infrastructure area, however, this will be limited to the subject land only. The introduction of pests, weeds, or pathogens above levels currently found in the locality will be managed in the implementation of the site-specific environmental management plans. The proposed activity is, therefore, unlikely to impact the quality of habitat for this species outside of the subject land.

Given the high mobility of this species, the large areas of habitat within the locality and the narrow extent (18 m) of potential habitat proposed for removal, the works are unlikely to cause Southern Whiteface population decline.

- *result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat*

The removal of 10.11 ha of potential foraging habitat in the form of native vegetation will not result in invasive species that are harmful to the species becoming established in their habitat. Weed management procedures should be included in the site-specific environmental management plans to ensure plant and equipment do not introduce new weeds or spread weed propagules within the study area.

- *introduce disease that may cause the species to decline, or*

It is unlikely that the proposed action would introduce disease that may cause the species to decline. The proposed works would not cause a new disease to be introduced into the population.

- *interfere substantially with the recovery of the species.*

The proposal is unlikely to substantially interfere with the recovery of the species given the narrow (18 m) and linear area foraging habitat to be impacted (10.11 ha of potential foraging and 48 HBTs). Furthermore, as comparatively large areas of habitat remain within the locality, the relative impact of the proposed works on the recovery of the species is considered low.

Conclusion of the EPBC Act Significant Impact Criteria Guidelines (DotE 2013) for Southern Whiteface

- There are no important populations of Southern Whiteface in the region
- The proposal is unlikely to significantly impact on the breeding cycle of this species
- the proposal is unlikely to lead to an increase in the invasion of weeds, disease, quality of habitat in the locality outside of the subject land, or lead to the introduction of invasive predators
- the proposal would not affect critical habitat (e.g. further fragment the surrounding bushland or remove essential habitat) that will cause the species to decline; and
- suitable foraging habitat is found in the locality of the study area.

Given that the proposal does not impact an important population of Southern Whiteface, and is not likely to lead to the decline of the species in the area, it is not recommended that the Project is referred to the Commonwealth Minister.

Corben's Long-eared Bat (Nyctophilus corbeni) – vulnerable species

Corben's Long-eared Bat is a relatively large microchiropteran bat species, weighing up to 21 grams. The species is found in the inland parts of NSW. It is frequently captured in the Pilliga Forest, is relatively common in QLD, but otherwise rare in NSW (TSSC 2015).

Corben's Long-eared Bat occurs in a range of habitats, that include mallee woodland, box-ironbark woodland, Buloke woodlands, Belah woodlands and Brigalow. It appears to be more common in larger, contiguous patches of older growth forest and woodlands, rather than smaller and younger patches. The species roosts in the hollows of small living and dead trees, with several records in dead Buloke.

The species was the subject of a recent taxonomic revision, meaning that knowledge of threats to the species are poorly understood. However, habitat loss and fragmentation are considered known threats. Inappropriate fire regimes, the removal of hollow bearing trees, agrichemicals, grazing are predation by feral animals are potential threats (TSSC 2015).

Important populations of the species have not been identified (Commonwealth DCCEEW 2015).

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population of a species*

There EPBC Act Protected Matters Seach Tool (PMST) identified the presence of Corben's Long-eared Bat within 25 km of the study area (**Appendix G**), however, the BAM-C did not list this species as a candidate species. As a consequence of the species not being named as a candidate species, survey was not undertaken as the species was considered unlikely to occur. However, the habitat on site is consistent with the species requirements are there are records of Corben's Long-eared Bat on the Cobar Peneplain.

The Conservation Advice does not name any important populations for this species.

Given that the proposed has reduced the number of hollow bearing trees to be removed, and the number of hollow bearing trees that will remain in the landscape, the proposal is not likely to lead to a long term decrease in a local population, should one occur.

- *reduce the area of occupancy of an important population*

The Conservation Advice does not name any important populations for Corben's Long-eared Bat. Nevertheless, while the proposal will remove 10.11 ha of woodland which includes 48 hollow bearing trees. Given the mobile nature of the species, it is unlikely that a predominantly linear impact will significantly reduce the area of occupancy of this species.

- *fragment an existing population into two or more populations*

Fragmentation is considered a known threat to this species. It is possible that a population of Corben's Long-eared Bat occurs in the region. However, given the mobile nature of the species, the predominantly linear impact of the proposal, and the extent of similar habitat in the landscape, it is unlikely that the proposal will fragment an existing population into two or more populations.

- *adversely affect habitat critical to the survival of a species*

Habitat critical to the survival of Corben's Long-eared Bat has not been clearly specified in the Conservation Advice in NSW. The Conservation Advice suggests that old-growth vegetation is important for the species in Victoria.

However, it is reasonable to assume that limiting habitat for the species would include hollow bearing trees or appropriate proportions. The proposal will remove up to 48 hollow-bearing trees within 10.11 ha of potential habitat. A preclearing survey by an ecologist is recommended prior to tree clearing to identify roost trees so that appropriate precautions can be implemented to allow relocation of individuals and salvage of hollows for re-use elsewhere in the Project area.

- *disrupt the breeding cycle of an important population*

The Conservation Advice does not name any important populations of Corben's Long-eared Bat. Breeding habitat would include living or dead trees with hollows. If Corben's Long-eared Bat was present in the subject land, and if it were breeding in one of the 48 hollow bearing trees, it is possible that a short-term disruption to the breeding cycle of the species may occur. As a precaution, if clearing works are to occur during the breeding period for Corben's Long-eared Bat, a qualified ecologist should inspect the HBTs onsite for the species (**Section 6.6.1**).

Given the wide distribution of this species and the presence of suitable nesting and foraging habitat outside the subject land, the proposal is unlikely to significantly disrupt the breeding cycle of a population of this species long-term.

- *modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

Habitat loss is considered a known threat to the species. Within the subject land, 10.11 ha of native vegetation which contains HBTs will be impacted by the proposed development. The proposed impact in woodland is predominantly linear. Given that the species is highly mobile and the presence of extensive areas of suitable habitat in the landscape, the proposed removal of woodland and HBTs is not likely to cause the species to decline.

- *result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat*

The removal of 10.11 ha of potential foraging habitat in the form of native vegetation will not result in invasive species that are harmful to Corben's Long-eared Bat becoming established in their habitat. Weed management procedures should be included in the site-specific environmental management plans to ensure plant and equipment do not introduce new weeds or spread weed propagules within the study area.

- *introduce disease that may cause the species to decline, or*

It is unlikely that the proposed action would introduce disease that may cause Corben's Long-eared Bat to decline. The proposed works would not cause a new disease to be introduced into the population.

- *interfere substantially with the recovery of the species.*

The proposal is unlikely to substantially interfere with the recovery of the species given the predominantly linear impact (10.11 ha of potential foraging and 48 HBT's). Furthermore, as comparatively large areas of habitat remain within the locality, the relative impact of the proposed works on the recovery of Corben's Long-eared Bat is considered low.

Conclusion of the EPBC Act Significant Impact Criteria Guidelines (DotE 2013) for Corben's Long-eared Bat

- There are no important populations of Corben's Long-eared Bat
- The proposal is unlikely to significantly impact on the breeding cycle of this species
- The proposal is unlikely to result in a decline in the species cause by habitat loss and fragmentation.
- the proposal will remove 48 HBTs, however, the impact of the proposal has been reduced, such that hundreds of HBTs will be retained; and
- suitable foraging habitat is found in the locality of the study area.

Given that the proposal does not impact an important population of Corben's Long-eared Bat, and is not likely to lead to the decline of the species in the area, it is not recommended that the Project is referred to the Commonwealth Minister.

Appendix D Guide for mapping threatened species (DPIE 2020c)

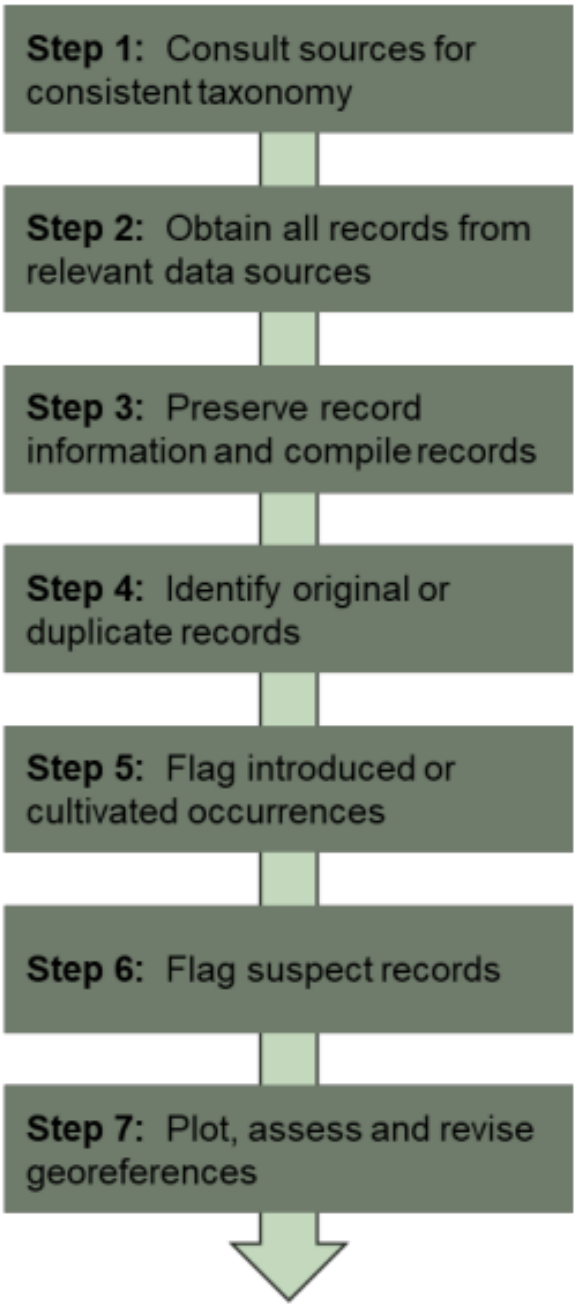


Figure 1 **Summary of the process for compiling the dataset of occurrence records for threatened species**

Appendix E Biodiversity credit reports

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id 00047700/BAAS17024/24/00047703	Proposal Name Girilambone Constellation and Haul Road	BAM data last updated * 28/10/2024
Assessor Name Bruce Mullins	Assessor Number BAAS17024	BAM Data version * Current classification (live - default) (80)
Proponent Names	Report Created 17/07/2025	BAM Case Status Finalised
Assessment Revision 4	BOS entry trigger BOS Threshold: Area clearing threshold	Assessment Type Part 4 Developments (General)
Date Finalised 17/07/2025	* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.	

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Nil

Additional Information for Approval

BAM Biodiversity Credit Report (Like for like)

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Calyptorhynchus lathami lathami / South-eastern Glossy Black-Cockatoo
Grantiella picta / Painted Honeyeater
Haliaeetus leucogaster / White-bellied Sea-Eagle

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion	Not a TEC	97.5	237	36	273
105-Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion	Not a TEC	0.1	2	0	2

BAM Biodiversity Credit Report (Like for like)

103-Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Western Peneplain Woodlands This includes PCT's: 103, 135, 145	Western Peneplain Woodlands >=50% and <70%	103_Open_Woodland	No	36	Canbelego Downs, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Western Peneplain Woodlands This includes PCT's: 103, 135, 145	Western Peneplain Woodlands >=50% and <70%	103_DNG	No	0	Canbelego Downs, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Western Peneplain Woodlands This includes PCT's: 103, 135, 145	Western Peneplain Woodlands >=50% and <70%	103_Woodland	Yes	237	Canbelego Downs, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

105-Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region

Assessment Id
00047700/BAAS17024/24/00047703

Proposal Name
Girilambone Constellation and Haul Road

BAM Biodiversity Credit Report (Like for like)

	Western Peneplain Woodlands This includes PCT's: 72, 98, 103, 105, 108, 109, 134, 135, 145, 245, 246	Western Peneplain Woodlands <50%	105_Intact	Yes	2	Canbelego Downs, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Ninox connivens / Barking Owl	**103_Open_Woodland, 103_Woodland, 105_Intact**	7.9	244.00
Tyto novaehollandiae / Masked Owl	**105_Intact**	0.1	3.00

Credit Retirement Options

Like-for-like credit retirement options

Ninox connivens / Barking Owl	Spp	IBRA subregion
	Ninox connivens / Barking Owl	Any in NSW
Tyto novaehollandiae / Masked Owl	Spp	IBRA subregion
	Tyto novaehollandiae / Masked Owl	Any in NSW

Appendix F *Lophochroa leadbeateri* (eastern Pink Cockatoo) Conservation Advice Risk Matrix (Commonwealth DCCEEW 2023a)

Table 2 Risk Matrix

Likelihood	Consequences				
	Not significant	Minor	Moderate	Major	Catastrophic
Almost certain				• Clearing of native vegetation and loss of hollow-bearing trees • Fire regimes that cause biodiversity declines • Competition for nest hollows • Increased likelihood of extreme events (e.g., wildfire, heatwave and drought)	
Likely		• Vehicle strike			
Possible		• Bird and egg collection	• Grazing • Psittacine Beak and Feather Disease (PBFD)		
Unlikely					
Unknown					

Risk Matrix legend/Risk rating:

Low Risk	Moderate Risk	High Risk	Very High Risk

Appendix G EPBC Act Protected Matters Search Tool generated report for 25 km buffer area

Listed Threatened Species [Resource Information]

Species ID	Scientific Name	Common Name	Class	Simple Presence	Presence Text	Threatened Category	Migratory Status	Migratory Category	Marine Status
856	*Calidris ferruginea*	Curlew Sandpiper	Bird	May	Species or species	Critically Endangered	Migratory	Migratory Wetlands	Listed - overfly marine
85104	*Phascolarctos*	Koala (combined	Mammal	May	Species or species	Endangered			
76155	*Bidyanus bidyanus*	Silver Perch, Bidyan	Fish	May	Species or species	Endangered			
26171	*Maccullochella*	Trout Cod	Fish	May	Species or species	Endangered			
1001	*Botaurus poiciloptilus*	Australasian Bittern	Bird	Likely	Species or species	Endangered			
82926	*Lophochroa*	Major Mitchell's	Bird	Known	Species or species	Endangered			
1179	*Hemiaspis damelii*	Grey Snake	Reptile	Likely	Species or species	Endangered			
77037	*Rostratula australis*	Australian Painted	Bird	Likely	Species or species	Endangered			Listed - overfly marine
9190	*Lepidium*	Winged Pepper-cress	Plant	May	Species or species	Endangered			
67093	*Melanodryas cucullata*	South-eastern Hooded	Bird	Likely	Species or species	Endangered			
66632	*Macquaria*	Macquarie Perch	Fish	May	Species or species	Endangered			
25934	*Anomalopus mackayi*	Five-clawed Worm-	Reptile	May	Species or species	Vulnerable			
529	*Aphelocephala*	Southern Whiteface	Bird	Known	Species or species	Vulnerable			
934	*Leipoa ocellata*	Malleefowl	Bird	Likely	Species or species	Vulnerable			
738	*Polytelis swainsonii*	Superb Parrot	Bird	Known	Species or species	Vulnerable			
6765	*Swainsona murrayana*	Slender Darling-pea,	Plant	May	Species or species	Vulnerable			
59398	*Stagonopleura guttata*	Diamond Firetail	Bird	Known	Species or species	Vulnerable			
8008	*Maireana cheelii*	Chariot Wheels	Plant	May	Species or species	Vulnerable			
67036	*Calyptorhynchus*	South-eastern Glossy	Bird	May	Species or species	Vulnerable			
863	*Gallinago hardwickii*	Latham's Snipe,	Bird	May	Species or species	Vulnerable	Migratory	Migratory Wetlands	Listed - overfly marine
83395	*Nyctophilus corbeni*	Corben's Long-eared	Mammal	Likely	Species or species	Vulnerable			
13792	*Bertya opponens*	null	Plant	May	Species or species	Vulnerable			
66704	*Austrostipa metatoris*	null	Plant	May	Species or species	Vulnerable			
726	*Neophema*	Blue-winged Parrot	Bird	Likely	Species or species	Vulnerable			Listed - overfly marine
470	*Grantiella picta*	Painted Honeyeater	Bird	Likely	Species or species	Vulnerable			
929	*Falco hypoleucos*	Grey Falcon	Bird	Likely	Species or species	Vulnerable			
874	*Calidris acuminata*	Sharp-tailed Sandpiper	Bird	May	Species or species	Vulnerable	Migratory	Migratory Wetlands	Listed

Listed Threatened Ecological Communities						[Resource Information]
				Presence		
Community ID	**Community Name**	**Threatened Category**	**Website**	**Rank**	**Text**	**Buffer Status**
86	Grey Box (Eucalyptus	Endangered	Species Profile and	Likely	Community likely to	In feature area
26	The community of	Endangered	Species Profile and	Likely	Community likely to	In buffer area only
98	Weeping Myall	Endangered	Species Profile and	Likely	Community likely to	In feature area
141	Poplar Box Grassy	Endangered	Species Profile and	Likely	Community likely to	In feature area
66	Coolibah - Black Box	Endangered	Species Profile and	Likely	Community likely to	In buffer area only

Listed Migratory Species									[Resource Information]
				Presence					
Species ID	**Scientific Name**	**Common Name**	**Class**	**Rank**	**Text**	**Threatened Category**	**Migratory Status**	**Migratory Category**	**Marine Status**
678	*Apus pacificus*	Fork-tailed Swift	Bird	Likely	Species or species		Migratory	Migratory Marine Birds	Listed - overfly marine
644	*Motacilla flava*	Yellow Wagtail	Bird	May	Species or species		Migratory	Migratory Terrestrial	Listed - overfly marine
858	*Calidris melanotos*	Pectoral Sandpiper	Bird	May	Species or species		Migratory	Migratory Wetlands	Listed - overfly marine
863	*Gallinago hardwickii*	Latham's Snipe,	Bird	May	Species or species	Vulnerable	Migratory	Migratory Wetlands	Listed - overfly marine
952	*Pandion haliaetus*	Osprey	Bird	May	Species or species		Migratory	Migratory Wetlands	Listed
59309	*Actitis hypoleucos*	Common Sandpiper	Bird	May	Species or species		Migratory	Migratory Wetlands	Listed
856	*Calidris ferruginea*	Curlew Sandpiper	Bird	May	Species or species	Critically Endangered	Migratory	Migratory Wetlands	Listed - overfly marine
874	*Calidris acuminata*	Sharp-tailed Sandpiper	Bird	May	Species or species	Vulnerable	Migratory	Migratory Wetlands	Listed

Appendix H Environmental conditions during threatened species surveys from Girilambone (Station ID: 051164) (BOM 2022, 2023)

Survey undertaken	Date	Temperature		Wind		Rainfall (mm)	Conditions relevant to species
		Min (ºC)	Max (ºC)	Direction	Speed (km/h)		
Songmeter deployment and subject land traversing	29/8/2022	11.1	16.4	-	-	0.4	
Songmeter deployment and subject land traversing	30/8/2022	12	22.2	-	-	2.2	
Songmeter deployment and subject land traversing	31/8/2022	6.9	19.6	-	-	0.2	
Songmeter deployment and subject land traversing	1/9/2022	3.2	21.6	-	-	0	
Songmeter deployment and subject land traversing	2/9/2022	10.8	15.2	-	-	0	
Songmeter deployment	3/10/2022	4.4	24.3	-	-	0	
Songmeter deployment	4/10/2022	7.4	26.3	-	-	0	
Songmeter deployment	5/10/2022	14.6	15.6	-	-	2.8	
Songmeter deployment	6/10/2022	11.6	23.9	-	-	58.4	Sloanes froglet – ‘after flooding rains’ (DPIE 2020a)
Songmeter deployment	7/10/2022	15.5	21.4	-	-	7.4	Sloanes froglet – ‘after flooding rains’ (DPIE 2020a)

Survey undertaken	Date	Temperature		Wind		Rainfall (mm)	Conditions relevant to species
		Min (ºC)	Max (ºC)	Direction	Speed (km/h)		
Songmeter deployment	8/10/2022	16.1	19.6	-	-	10.8	Sloanes froglet – 'after flooding rains' (DPIE 2020a)
Songmeter deployment	9/10/2022	6.5	19.8	-	-	20.4	Sloanes froglet – 'after flooding rains' (DPIE 2020a)
Songmeter deployment and subject land traversing	10/10/2022	5.9	21.5	-	-	0.2	
Songmeter deployment and subject land traversing	11/10/2022	7.1	23.3	-	-	0	
Songmeter deployment and subject land traversing	12/10/2022	12.3	23	-	-	0	
Songmeter deployment and subject land traversing	13/10/2022	15.9	26.3	-	-	0	
Songmeter deployment	14/10/2022	11.4	22.9	-	-	13.2	
Songmeter deployment	15/10/2022	6.3	23.3	-	-	0.2	
Songmeter deployment	16/10/2022	10.1	22.9	-	-	0	
Songmeter deployment	17/10/2022	7.5	23.4	-	-	0	
Songmeter deployment	18/10/2022	10.3	24.6	-	-	0	
Songmeter deployment	19/10/2022	16.9	20	-	-	0.6	
Songmeter deployment	20/10/2022	16.6	25.6	-	-	21	
Songmeter deployment	21/10/2022	15.8	25.9	-	-	2	

Survey undertaken	Date	Temperature		Wind		Rainfall (mm)	Conditions relevant to species
		Min (ºC)	Max (ºC)	Direction	Speed (km/h)		
Songmeter deployment	22/10/2022	17.3	26.6	-	-	7.6	
Songmeter deployment	23/10/2022	14.3	28	-	-	3.6	
Songmeter deployment	24/10/2022	16.5	26.3	-	-	12.4	
Songmeter deployment	25/10/2022	12.4	26.4	-	-	31.6	
Songmeter deployment	26/10/2022	11.6	27.2	-	-	0	
Songmeter deployment	27/10/2022	14.9	27.2	-	-	0	
Songmeter deployment	28/10/2022	11.1	25.3	-	-	0	
Songmeter deployment	29/10/2022	10.9	25.9	-	-	0	
Songmeter deployment	30/10/2022	11.2	26.8	-	-	0	
Songmeter deployment	31/10/2022	15.7	27	-	-	3	
Songmeter deployment	1/11/2022	12.2	19.2	-	-	26.4	
Songmeter deployment	1/11/2022	6	18.8	-	-	4	
Songmeter deployment	2/11/2022	5.6	21.7	-	-	0	
Songmeter deployment	3/11/2022	8.3	23.4	-	-	0	
Songmeter deployment	4/11/2022	8	25.9	-	-	0	

Survey undertaken	Date	Temperature		Wind		Rainfall (mm)	Conditions relevant to species
		Min (ºC)	Max (ºC)	Direction	Speed (km/h)		
Songmeter deployment	5/11/2022	11.1	26.4	-	-	0	
Songmeter deployment	6/11/2022	13	25.1	-	-	0	
Songmeter deployment	7/11/2022	9.9	25.9	-	-	0	
Songmeter deployment	8/11/2022	10.4	27.6	-	-	0	
Songmeter deployment	9/11/2022	12.7	28.2	-	-	0	
Songmeter deployment	10/11/2022	15.5	29.8	-	-	1.8	
Songmeter deployment	11/11/2022	16.5	30.5	-	-	21.8	
Songmeter deployment	12/11/2022	20.1	23.5	-	-	1.4	
Songmeter deployment	13/11/2022	16.1	25.4	-	-	8	
Songmeter deployment	14/11/2022	11.9	24.1	-	-	4.6	
Songmeter deployment	15/11/2022	7	21	-	-	0	
Songmeter deployment	16/11/2022	6.4	22	-	-	0	
Songmeter deployment	17/11/2022	6.1	25.4	-	-	0	
Songmeter deployment	18/11/2022	12.5	29.9	-	-	0	
Songmeter deployment	19/11/2022	17.2	25.1	-	-	0.4	

Survey undertaken	Date	Temperature		Wind		Rainfall (mm)	Conditions relevant to species
		Min (ºC)	Max (ºC)	Direction	Speed (km/h)		
Songmeter deployment	20/11/2022	8.7	23.5	-	-	0	
Songmeter deployment	21/11/2022	7.1	22.4	-	-	0	
Songmeter deployment	22/11/2022	8.2	26.8	-	-	0	
Songmeter deployment	23/11/2022	4.4	19.2	-	-	0	
Subject land traversing	26/9/2023	11.2	32.9	-	-	0	
Subject land traversing	27/9/2023	11.5	32.8	-	-	0	
Subject land traversing	28/9/2023	12.7	29.6	-	-	0	
Subject land traversing	26/10/2023	10.6	20.1	-	-	0	

'-' Wind speed and direction not recorded at Girilambone weather station (BOM)

Appendix I Koala species expert report (Dr Phillips, Biolink 2024)

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13 August 2025

Helen Wood
Principal
AARC Environmental Solutions Pty Ltd
Via email: hwood@aarc.au

RE: Constellation Project EIS Amendment – Air Quality and Noise

Dear Helen,
Todoroski Air Science have prepared this report for Aeris Resources Limited in relation to the Constellation Project, located in the Bogan Shire Local Government Area (LGA) in central-western New South Wales (NSW) (hereafter referred to as the Project).

This report serves as an addendum to the *Air Quality Impact Assessment Constellation Project* (the AQIA) (**Todoroski Air Sciences, 2024a**) and the *Noise Impact Assessment Constellation Project* (the NIA) (**Todoroski Air Sciences, 2024b**), and addresses proposed amendments to the Project's Environmental Impact Statement (EIS).

Overview of Proposed EIS Amendments
The proposed amendments to the EIS include:

- Minor realignment to the infrastructure corridor along:
  - Lot 10 DP48604 (refer to **Figure 1**); and,
  - Lot 2 DP1296861 and Lot 19 DP751331 (refer to **Figure 2**).
- Incorporation of a buried power cable alongside the water supply pipeline within the infrastructure corridor.
- Revision of the construction operation hours to allow works 24 hours per day.

The minor realignments to the infrastructure corridor refine its position in relation to local features. The construction activities for the Project which may occur with the revised hours include:

- Development of the mine site, including
  - Site preparation;
  - Construction of surface infrastructure;

- Box cut and portal access development;
- Installation of underground ventilation systems; and,
- Water management infrastructure.

- Construction of a 2,850 metre (m) section of new road to provide access, bypassing the Girilambone town, as well as upgrading existing roads within the infrastructure corridor.
- Installation of buried power cable between the Project mine site and the Murrawombie Copper Mine, within the infrastructure corridor alongside the underground water supply pipeline.

The proposed revision to allow 24-hour construction is intended to facilitate works on public and new private roads during night-time periods when traffic volumes are lower. This approach improves safety and minimises disruption to road users, particularly at the Mitchell Highway intersections. It also provides flexibility to manage construction activities around unpredictable or inclement weather conditions that may otherwise delay progress. Additionally, enabling continuous construction will help expedite the overall construction timeline and reduce the duration of impacts associated with roadworks, ultimately minimising inconvenience to the local community.

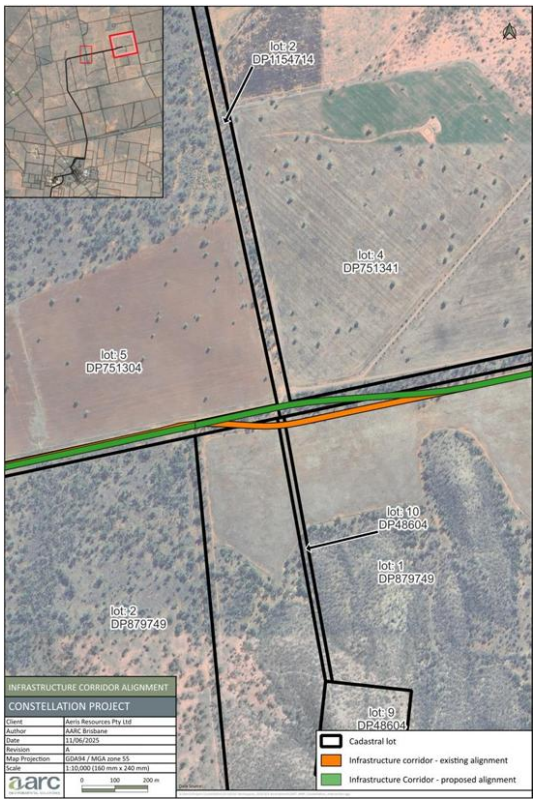


Figure 1: Corridor realignment on Lot 10 DP48604

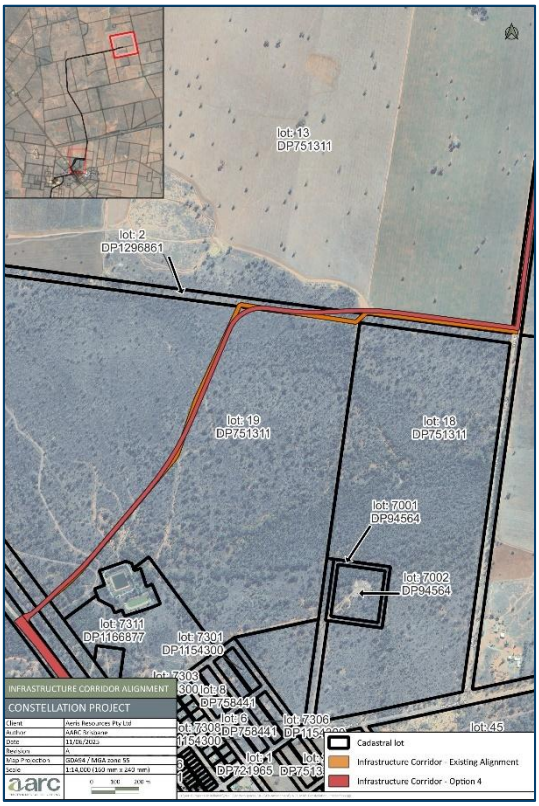


Figure 2: Corridor realignment on Lot 2 DP1296861 and Lot 19 DP751331

To assess the potential change in air quality impact associated with these amendments, a qualitative assessment has been undertaken, given the inherently low potential for air quality impacts from the amended activities.

In contrast, a quantitative modelling assessment has been carried out to evaluate potential noise impacts at nearby residential receptors. This was necessary due to changes in location of construction activities relative to these receptors, in particular along the infrastructure corridor. The predicted noise levels have been used to inform the identification and application of appropriate noise mitigation measures for the construction activities.

Air Quality Assessment

The EIS amendments are not expected to result in any additional dust. The infrastructure corridor realignments generally follow the original alignment, deviating by approximately 50m, and are considered relatively minor. Given the nearest residential receptors are located more than 1 kilometre (km) from the realignment areas, the changes are expected to have a negligible impact in terms of air quality.

Construction activities along the infrastructure corridor will include surface works to widen and prepare the area, trenching and minor excavation for the installation of the water pipeline and power cable, and general upgrades to the road surface.

The shift to 24-hour construction may reduce the potential for atmospheric dispersion of dust during night-time periods. While this could increase the potential for dust impacts in areas immediately adjacent the construction zone, the effect at more distant receptor locations is expected to remain negligible.

Importantly, enabling construction to proceed during night hours will allow works, particularly those along the public roads and nearest to residential receptors, to be completed quickly, thereby reducing the duration and potential for dust related impacts or nuisance. Limiting construction to daytime hours would extend the overall duration of works and potentially increase the dust exposure at receptor locations.

Dust emissions from these activities are expected to be easily managed through standard mitigation measures, as outlined in **Table 1**. These measures will be formalised in a Construction Environmental Management Plan (CEMP) for the Project.

Table 1: Dust mitigation measures for construction activities

Source	Mitigation Measure
General	Weather forecast to be checked prior to undertaking material handling or processing.
	Engines of on-site vehicles and plant to be switched off when not in use.
	Vehicles and plant are to be fitted with pollution reduction devices where practicable.
	Vehicles are to be maintained and serviced according to manufacturer's specifications.
	Visual monitoring of activities is to be undertaken to identify dust generation.
Exposed areas/stockpiles	The extent of exposed surfaces and stockpiles is to be kept to a minimum.
	Exposed areas and stockpiles are either to be covered or are to be dampened with water as far as is practicable if dust emissions are visible.
Material handling	Reduce drop heights from loading and handling equipment where practical.
	Dampen material when excessively dusty during handling.
Hauling activities	Unsealed haul roads should be watered using water carts such that the road surface has sufficient moisture to minimise on-road dust generation but not so much as to cause mud/dirt track wash-out to occur.
	Regularly inspect haul roads to ensure they remain in good operational condition
	Vehicle traffic is to be restricted to designated routes.
	Speed limits are to be enforced.
	Vehicle loads are to be covered when travelling off-site.

Noise Assessment

Similar to the air assessment, the proposed infrastructure corridor realignments do not deviate substantially from the original alignment and are therefore expected to result in negligible noise impacts at the nearest residential receptors.

However, the proposed extension of construction hours to allow works 24 hours per day, outside the EIS proposed surface construction hours of 6am to 10pm, seven days a week, requires a quantitative assessment to determine the potential noise impacts and to guide the selection of appropriate mitigation measures. Construction work will occur both at the mine site and along the infrastructure corridor between the Project site and the Murrawombie Copper Mine. The infrastructure corridor includes sections of both public road and newly constructed private roads (through mine-owned land) for the Project to bypass the township of Girilambone.

The justification for construction outside recommended hours include:

- Traffic minimisation – reducing construction vehicle movements during daytime hours to minimise traffic disruptions;
- Safety or operational constraints – enabling work on public roads to be undertaken when traffic volumes are lower, reducing risk to workers and the public;
- Community preference – allowing night works to shorten the overall construction duration and reduce prolonged disruption; and,
- Unpredictable factors – accommodating delays due to inclement weather that may otherwise extend the construction period.

This assessment has been prepared using the framework outlined in the NSW Environment Protection Authority (EPA) *Draft Construction Nosie Guideline* (**NSW EPA, 2020**). Given that a significant portion of construction activities will take place on or adjacent to public roads, guidance from the Transport for NSW (TfNSW) *Construction Noise and Vibration Guideline (Roads)* (**TfNSW, 2024**) have also been considered to inform appropriate noise management practices.

A quantitative construction noise assessment has been undertaken in accordance with these guidelines, given the proposed out-of-hours works and the proximity of construction activities (along the infrastructure corridor) to noise sensitive receptors.

Assessment scenario

Construction activities occurring at the Project site during night-time periods are expected to generate similar or less noise than those assessed under the operational scenario in the NIA. The operational scenario in the NIA considers noise-enhancing meteorological conditions representative of night-time periods and demonstrated that predicted levels remain below the applicable noise management level for construction outside of recommended standard hours (i.e. 35db(A), equivalent to RBL + 5 db(A)) at the residential receptors. A minimum Rating Background Level (RBL) of 35bd(A), as specified in the *Noise Policy for Industry* (**NSW EPA, 2017**), has been adopted to represent the background noise levels. This minimum applies even where actual background noise levels are likely to be lower, as is expected for the Project, and represents the most stringent applicable value.

As such, construction works at the Project site are anticipated to comply with the relevant noise management levels, and no further assessment is conducted.

Instead, detailed noise assessment has focused on construction activities associated with the infrastructure corridor. These activities include corridor preparation and widening, installation of the underground water supply pipeline and buried power cable, and road upgrades.

For each scenario, the key noise-generating equipment has been identified and used to develop a representative construction noise inventory (refer to **Table 2**). Among these scenarios, the corridor preparation and widening works represent the highest noise generation potential and have been used as the basis for noise modelling. It has been conservatively assumed that these works may occur along all sections of the infrastructure corridor.

Table 2: Construction noise scenarios

Scenario	Equipment	Sound power levels (dBA)*
Infrastructure corridor preparation and widening	Dozer	117
	Excavator	112
	Truck	121
	Watercart	118
Installation of the underground water supply pipeline and buried power cable	Excavator	111
	Truck	121
	Water cart	118
Road upgrade	Grader	120
	Vibratory roller	120
	Truck (tipping fill)	115

* Defra Noise Database

The modelling incorporates noise-enhancing meteorological conditions identical to that used in the NIA, representing likely worst-case conditions during night-time periods.

Noise sources were positioned at three representative locations along the corridor, specifically at points closest to residential receptors and most likely to result in maximum noise impacts

Figure 3 presents the location of the Project, the closest residences to the infrastructure corridor and the representative locations considered in this assessment.

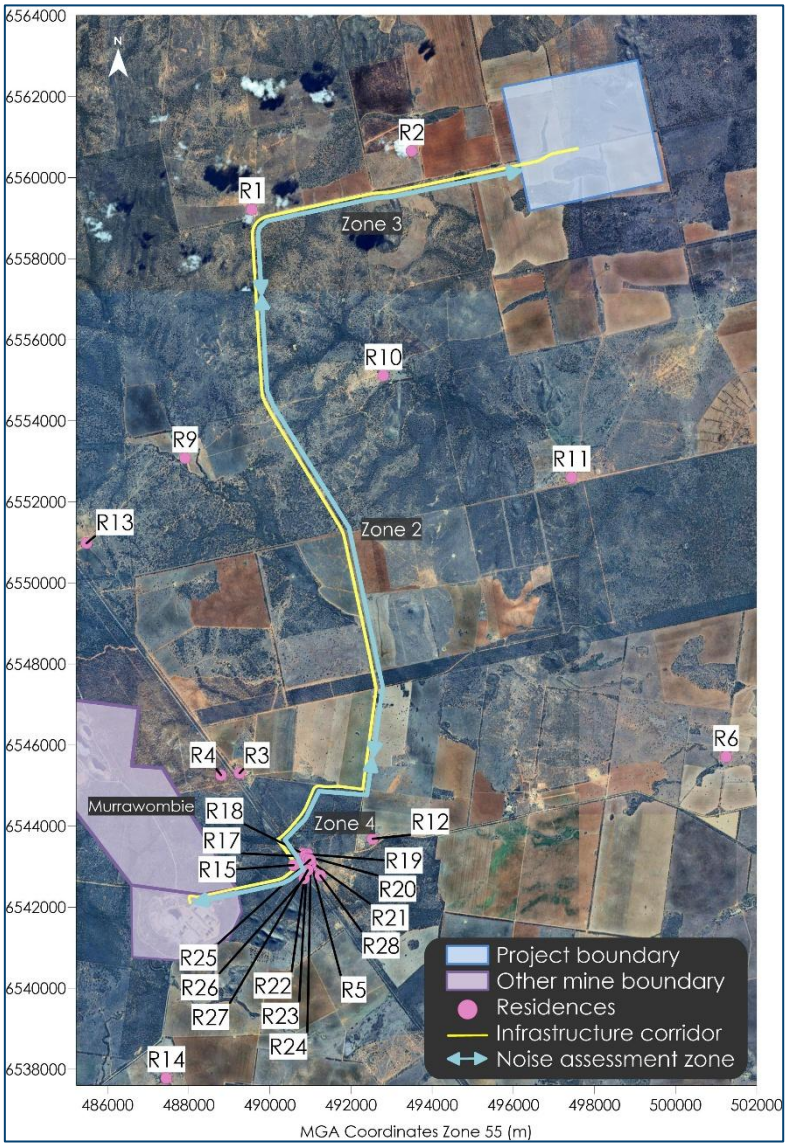


Figure 3: Project setting and residences

Predicted noise levels

Table 3 presents the predicted construction noise levels at the assessed residential receptor locations for a single worst-case operational scenario occurring outside of standard construction hours.

The modelling results indicate that several receptors, primarily those located in the township of Girilambone due to Zone 4, as well as one receptor (R1) located near the infrastructure corridor in Zone 3, are predicted to experience noise levels above the applicable noise management level (RBL + 5 dB(A)). However, no receptors are predicted to be highly noise-affected, i.e. experience noise levels above 65db(A). There are no predicted levels above applicable noise management level due to activity in Zone 2.

Even though the predicted noise levels from construction activities are below the noise management level, noting the adopted minimum RBL, it should be acknowledged that the noise may still be audible. It is recommended that proposed mitigation measures consider all potentially affected receivers.

Table 3: Predicted noise levels for construction outside of standard hours (dB(A))

Receptor ID	Predicted noise level	Noise management level	Level above management level
R1	**51**	**35**	>15 to 25
R2	<35	**35**	<5
R3	<35	**35**	<5
R4	<35	**35**	<5
R5	**44**	**35**	>5 to 15
R6	<35	**35**	<5
R7	<35	**35**	<5
R8	<35	**35**	<5
R9	<35	**35**	<5
R10	<35	**35**	<5
R11	<35	**35**	<5
R12	<35	**35**	<5
R13	<35	**35**	<5
R14	<35	**35**	<5
R15	**64**	**35**	>25
R16	<35	**35**	<5
R17	**50**	**35**	>5 to 15
R18	**44**	**35**	>5 to 15
R19	**43**	**35**	>5 to 15
R20	**47**	**35**	>5 to 15
R21	**48**	**35**	>5 to 15
R22	**54**	**35**	>15 to 25
R23	**53**	**35**	>15 to 25
R24	**45**	**35**	>5 to 15
R25	**45**	**35**	>5 to 15

Mitigation measures

Based on the construction noise modelling results, mitigation and community engagement will be required. It is recommended that all residential receptors receive some form of engagement, with additional targeted measures provided to those predicted to experience noise levels exceeding the applicable noise management level.

Mitigation measures have been considered based on the nature of the proposed construction activities, particularly works on public roads. These measures align with those in the *Construction Noise and Vibration Guideline (Roads)* (**TfNSW, 2024**), which provides a consistent, practical framework to assess and manage impacts. The guideline ensures works are planned responsibly, mitigation is applied where feasible and reasonable, and the public is appropriately informed. **Table 4** outlines the recommended standard mitigation measures to be applied during the construction period.

Table 4: Recommended standard mitigation measures for construction period

Mitigation measure	Details
Implement community consultation and notification measures	Advance notice (≥7 calendar days) of works, time periods, impacts, mitigation measures, and contact information. Provide updates where possible.
Site induction	All workers to receive induction covering noise/vibration controls, site-specific conditions, work hours, receiver locations, site logistics, and environmental incident procedures.

Mitigation measure	Details
Behavioural practices	No unnecessary shouting, loud radios, slamming doors, or dropping materials from height.
Construction hours and scheduling	Prioritise high-noise activities to daytime work where feasible.
Equipment selection	Use quieter and lower-vibration alternatives where possible.
Use and siting of plant	Maximise distance to receivers and throttle/shut off unused plant.
Site planning	Minimise reversing, group noisy activities and rotate work areas.
Reduced equipment power	Use equipment sized appropriately for the task.
Non-tonal and ambient sensitive reversing alarms	Fit all plant/vehicles with non-tonal or ambient-sensitive alarms.
Minimise delivery impacts	Load/unload far from receivers, use straps not chains, and avoid out-of-hours deliveries where possible.
Engine compression brakes	Limit use at night. Ensure proper silencers are fitted and maintained.

For residential receptors predicted to exceed noise management levels, additional graduated mitigation measures are recommended depending on the predicted exceedance level as follows:

- <5dB(A) above the noise management level – **Notification** as letterbox drop or equivalent, to provide advance warning of works and potential disruptions. The notification should detail work activities, times period, impacts and mitigation measures.
- >5 to 15dB(A) above the noise management level – **Notification** and;
  - **Verification** of noise levels as part of routine checks or following reasonable complaints. This verification should include measurement of the background noise level and construction noise.
  - **Duration Reduction** aims at reducing the impact on the community for longer-duration projects. Each of the impacted receptors should be visited to discuss the project to gain support for a Duration Reduction so that the project can be completed more quickly.
- >15 to 25dB(A) above the noise management level – **Notification**, **Verification**, **Duration Reduction**, and;
  - **Phone Calls** involve detailing relevant information made to impacted receptors within seven calendar days of proposed work. Phone calls provide impacted receptors with personalised contact and tailored advice, with the opportunity to provide comments on the proposed work and specific needs.
  - **Specific Notification** are letterbox dropped (or equivalent) to impacted receptors no later than seven calendar days ahead of construction activities that are likely to exceed the noise objectives. The specific notification provides additional information when relevant and informative to more highly-affected receivers than covered in general letterbox drops.
  - **Individual Briefings** are used to inform receptors about the impacts of high noise activities and mitigation measures that will be implemented. Project representatives would visit identified stakeholders at least 48 hours ahead of potentially disturbing construction activities. Individual briefings provide affected stakeholders with personalised contact and tailored advice, with opportunity to comment on the project.
- >25dB(A) above the noise management level –

- Individual Meetings to consult with the receptor(s) about the impacts of high noise activities and agree on mitigation measures to be implemented to alleviate the potential impact.

To ensure effective implementation of the mitigation measures, it is recommended that the construction contractor:

- Verify actual noise level using final equipment lists and construction sequencing.
- Prepare Construction Noise Management Plan that includes:
  - Final noise predictions;
  - Timeline and staging of construction activities; and,
  - Mitigation and engagement measures tailored to each location.

The CEMP will guide ongoing construction and ensure compliance with noise mitigation measure expectations identified in this assessment.

Summary and conclusion

This report has assessed the potential air quality and noise impacts associated with the proposed EIS amendments for the Project.

It is concluded that the proposed amendments will not result in any discernible additional air quality impacts above that presented in the AQIA.

A quantitative assessment of noise impacts associated with proposed construction activity occurring outside of standard hours was undertaken. The result indicates several residential receptors are predicted to experience levels above the applicable noise management level.

To address these potential impacts, a range of standard mitigation measures and additional mitigation measures focuses on community engagement have been identified. It is recommended that a CEMP be developed, incorporating the final construction methods, equipment, and schedule. The Construction Noise Management Plan should ensure that appropriate mitigation and consultation strategies are implemented to effectively manage potential noise impacts at sensitive receptor locations.

Please feel free to contact us if you would like to clarify any aspect of this report.

Yours faithfully,
Todoroski Air Sciences



Philip Henschke

References

NSW EPA (2017)

"Noise Policy for Industry", NSW Environment Protection Authority, October 2017.

NSW EPA (2020)

"Draft Construction Noise Guideline", prepared by NSW EPA, November 2020.

TfNSW (2024)

"Construction Noise and Vibration Guideline (Roads)", prepared by Transport for NSW, December 2024.

Todoroski Air Sciences (2024a)

"Air Quality Impact Assessment Constellation Project" prepared for Aeris Resources Limited by Todoroski Air Sciences, May 2024.

Todoroski Air Sciences (2024b)

"Noise Impact Assessment Constellation Project" prepared for Aeris Resources Limited by Todoroski Air Sciences, May 2024.



Constellation Copper Mine, Bogan NSW

Addendum to the Historical Heritage Assessment Report

Prepared for AARC Environmental Solutions Pty Ltd on behalf of Aeris Resources Pty Ltd
Prepared by Niche Environment and Heritage Pty Ltd | 27 June 2025

Excellence in
your environment.

1 July 2025

Gemma Brown
Aeris Resources
Level 6, 120 Edward Street
Brisbane QLD 4000

gbrown@aerisresources.com.au

Dear Gemma Brown,

Re: Constellation Copper Mine Project – Draft Addendum to the HHA Report (Niche ref: #6856)

Niche Environment and Heritage Pty Ltd (Niche) was commissioned by AARC Environmental Solutions Pty Ltd (AARC), on behalf of Aeris Resources Pty Ltd (Aeris) (hereafter referred to as 'the Proponent'), to prepare an Historical Heritage Assessment (HHA) for the proposed Constellation Copper Mine Project ('the Project'), located at 1921 Okeh Road, Girilambone and 1890 Okeh Road, Girilambone, New South Wales (NSW).

During the finalisation of the approval process for the Environmental Impact Statement (EIS), three amendments to the works impact areas were identified:

- Amendment 1: Haul road crown land avoidance.
- Amendment 2: Glendale alignment.
- Amendment 3: Inclusion of underground powerline in existing proposed 18 m infrastructure corridor. Amendment 3 also includes a minor adjustment to the footprint of the Mitchell Highway intersections to accommodate truck turning buffers.

All amendments are located within the original Subject Area and previously surveyed areas, with the exception of a portion of Amendment 1, which is located within an unsurveyed section of Okeh Road, a heavily altered access route with documented disturbance within the road corridor (see Section 4.1.1 of the Addendum to the HHA).

The proposed works also include a revised construction schedule, extending working hours from 6:00 AM - 10:00 PM to 24 hours per day. This change will have no impact on items or places of historical heritage significance.

Niche has prepared a report which details the alignment changes and any resulting impacts and mitigation measures.

Yours sincerely,



Caitlin McManus
Experienced Consultant - Heritage
Niche
E – consultation@niche-eh.com
T –0488 224 924

Document control

Project number	Client	Project manager	LGA
6856	AARC Environmental Solutions Pty Ltd on behalf of Aeris Resources Pty Ltd	Caitlin McManus	Bogan Shire Council

Version	Author	Review	Status	Comments	Date
D01	Caitlin McManus	Dr Morgan Disspain	Draft	Internal QA Review	26 June 2025

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Executive Summary

Report Summary

Niche Environment and Heritage Pty Ltd (Niche) was commissioned by AARC Environmental Solutions Pty Ltd (AARC), on behalf of Aeris Resources Pty Ltd (Aeris) (hereafter referred to as 'the Proponent'), to prepare an Historical Heritage Assessment (HHA) for the proposed Constellation Copper Mine Project ('the Project'), located at 1921 Okeh Road, Girilambone and 1890 Okeh Road, Girilambone, New South Wales (NSW) (hereafter referred to as 'the Subject Area').

The Project will initially comprise a new open-cut mining operation followed by underground operations. The Project will include typical mine site infrastructure to support the operations and ore handling. Once mined, ore will either be hauled from the Run of Mine (ROM) Pad to the Tritton Copper Mine for processing in the existing processing plant or heap leached on-site at a new heap leach facility.

Niche prepared an HHA (2024) as part of the project's Environmental Impact Statement (EIS). The HHA assessed the potential impacts of the construction and operation of the project on items and places of historical heritage significance and to meet the Secretary's Environmental Assessment Requirements (SEARs). The results of previous archaeological assessments, as well as the desktop assessment and survey undertaken as part of the HHA, determined that the Project will not directly or indirectly impact items or places of historical heritage significance.

Addendum

During the finalisation of the approval process for the EIS, there have been three amendments to the works impact areas:

- Amendment 1: Haul road crown land avoidance.
- Amendment 2: Glendale alignment.
- Amendment 3: Inclusion of underground powerline in existing proposed 18 m infrastructure corridor.

All amendments are located within the original Subject Area and previously surveyed areas, with the exception of a portion of Amendment 1, which is located within an unsurveyed section of Okeh Road, a heavily altered access route with prior disturbance (see Section 4.1.1).

The proposed works also include a revised construction schedule, extending working hours from 6:00 AM - 10:00 PM to 24 hours per day. The revised construction schedule will have no impact on items or places of historical heritage significance.

Niche was commissioned by Aeris Resources to prepare this Addendum to the HHA to assess the impacts of the amendments to known historical heritage items. This Addendum presents the results of the desktop assessment of the amendments and updates to the proposed impact and mitigation measures.

This Addendum to the HHA should be read in conjunction with the HHA (Niche, 2024).

Conclusion and recommendations

An assessment of the potential impacts of the proposed amendments and associated ground disturbance indicates that they will have no direct or indirect impact on items or places of historical heritage significance.

Therefore, the proposed amendments will not affect the historic heritage values within or adjacent to the Subject Area.

No further recommendations or mitigation measures, beyond those detailed in the HHA (Niche, 2024) are required.

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1. Introduction

1.1 Project outline

Niche Environment and Heritage Pty Ltd (Niche) was commissioned by AARC Environmental Solutions Pty Ltd (AARC), on behalf of Aeris Resources Pty Ltd (Aeris) (hereafter referred to as 'the Proponent'), to prepare an Historical Heritage Assessment (HHA) for the proposed Constellation Copper Mine Project ('the Project'), located at 1921 Okeh Road, Girilambone and 1890 Okeh Road, Girilambone, New South Wales (NSW) (hereafter referred to as 'the Subject Area').

The Project is proposed as a satellite site of Tritton Copper Operations (owned and operated by Aeris). Tritton Copper Operations operates as a hub and spoke model with Tritton Copper Mine serving as the hub (where the processing facility is located) and other surrounding deposits supplying ore for processing. The Project is located approximately 45 km north-east of the Tritton processing plant.

The Project will initially comprise a new open-cut mining operation followed by underground operations. The Project will include typical mine site infrastructure to support the operations and ore handling. Once mined, ore will either be hauled from the Run of Mine (ROM) Pad to the Tritton Copper Mine for processing in the existing processing plant or heap leached on-site at a new heap leach facility.

Supporting infrastructure for the proposed Project will include developing:

- A road upgrade between the Project site and the Mitchell Highway (to support haulage activity).
- A new T intersection to link the proposed haul road with the eastern side of the Mitchell Hwy (north of Girilambone).
- An upgrade to the intersection of the Mitchell Highway with Railway Road (west of Girilambone).
- A waste rock emplacement at the Project site.
- A run of mine stockpile to support the handling of mined ore.
- A mine laydown area and workshop.
- A heap leach pad and associated processing facility.
- A paste plant, emulsion storage and shotcrete batch plant
- Topsoil stockpiles.
- Potential solar farm and on-site power station.
- Water management and storage infrastructure, including a bi-directional water pipeline between the Project site and Murrawombie Copper Mine.
- A short east-west section of the existing Haul Road along Railway Road, within the Subject Area, will include a buried pipeline connecting to Aeris's Murrawombie Mine.
- The pipeline will be installed within the existing disturbed area, with no new disturbance proposed west of the Mitchell Highway.
- Administrative facilities including offices, amenities, and a car park.

Addendum

During the finalisation of the approval process for the Environmental Impact Statement (EIS), there have been three amendments to the works impact areas:

- Amendment 1: Haul road crown land avoidance.
- Amendment 2: Glendale alignment.
- Amendment 3: Inclusion of underground powerline in existing proposed 18 m infrastructure corridor.

  Amendment 3 also includes a minor adjustment to the footprint of the Mitchell Highway intersections to accommodate truck turning buffers.

All amendments are located within the original Subject Area and previously surveyed areas, with the exception of a portion of Amendment 1, which is located within an unsurveyed section of Okeh Road, a heavily altered access route with prior disturbance (see Section 4.1.1).

The proposed works also include a revised construction schedule, extending working hours from 6:00 AM - 10:00 PM to 24 hours per day. The revised construction schedule will have no impact on items or places of historical heritage significance.

Niche was commissioned by Aeris Resources to prepare this Addendum to the HHA to assess the impacts of the amendments to known historical heritage items. This Addendum presents the results of the desktop assessment of the amendments and updates to the proposed impact and mitigation measures.

This Addendum to the HHA should be read in conjunction with the HHA (Niche, 2024).

2. The Amendments

2.1 Description of land of proposed amendments

Amendment 1: Haul road Crown Land avoidance

The amended haul road alignment is associated with Lot 2 DP1154714, Lot 5 DP751304, Lot 1 DP879749, Lot 4 DP751304, and Lot 9 DP75132, and is located within the county of Canbelego and parishes of Stuart and Antares.

No known historical heritage items or areas of archaeological potential were identified within the vicinity of the amended alignment (Figure 1 and Figure 2).

Amendment 2: Glendale alignment

The Glendale haul road alignment is associated with Lot 13 DP751311, Lot 19 DP751311, and Lot 2 DP1296861, and is located within the county of Canbelego and parishes of Neiley and Courebone.

No known historical heritage items or areas of archaeological potential were identified within the vicinity of the amended alignment (Figure 1and Figure 2).

Amendment 3: Inclusion of underground powerline in existing proposed 18 m infrastructure corridor

The amendment is associated with the existing infrastructure corridor, including the haul road, and is located within the county of Canbelego and parishes of Neiley and Courebone.

The amendment will include an underground powerline located adjacent the proposed water pipeline trench for the entire length of the infrastructure corridor. The proposed trench is located in an area of existing proposed disturbance in the EIS. A minor adjustment to the footprint of the Mitchell Highway intersections to accommodate truck turning buffers is also proposed.

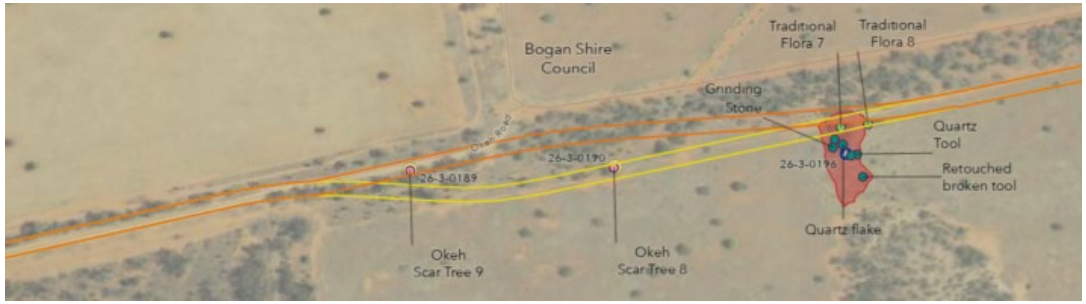
There will be no new disturbance proposed for either the underground powerline, pipeline, haul road west of the Mitchell Highway, or the Mitchell Highway intersections. The HHA covers a 5 m pipeline easement for modifications to re-design.

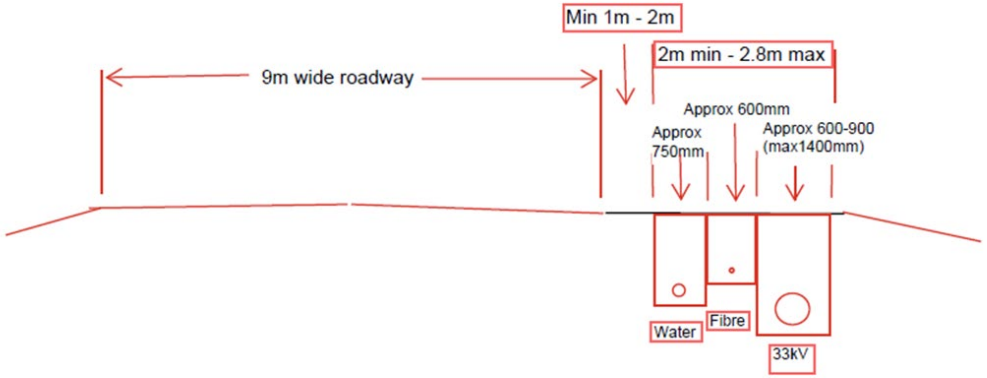
No known historical heritage items or areas of archaeological potential were identified within the vicinity of the amended alignment (Figure 1 and Figure 2).

2.2 Proposed activities

An outline of the proposed activities within each Amendment is presented in Table 1.

Table 1 Description of EIS amendments

Amendment	Amendment description	Figure (source: AARC)
1 Haul road Crown Land avoidance	The revised haul road alignment continues along the Okeh Road for approximately 350 m east with a gentle curve south into Lot 1 DP879749. The amendment will avoid Crown Land and provide a softer curve to the haul road.	 (Original alignment in yellow and revised alignment in orange)
2 Glendale haul road alignment	The revised Glendale haul road alignment is located within the previously surveyed Glendale property Lot 13 DP751311, Lot 19 DP751311, and Lot 2 DP1296861 with slight adjustments made to the west and east of the original route.	 (Original alignment in yellow and revised alignment in orange)

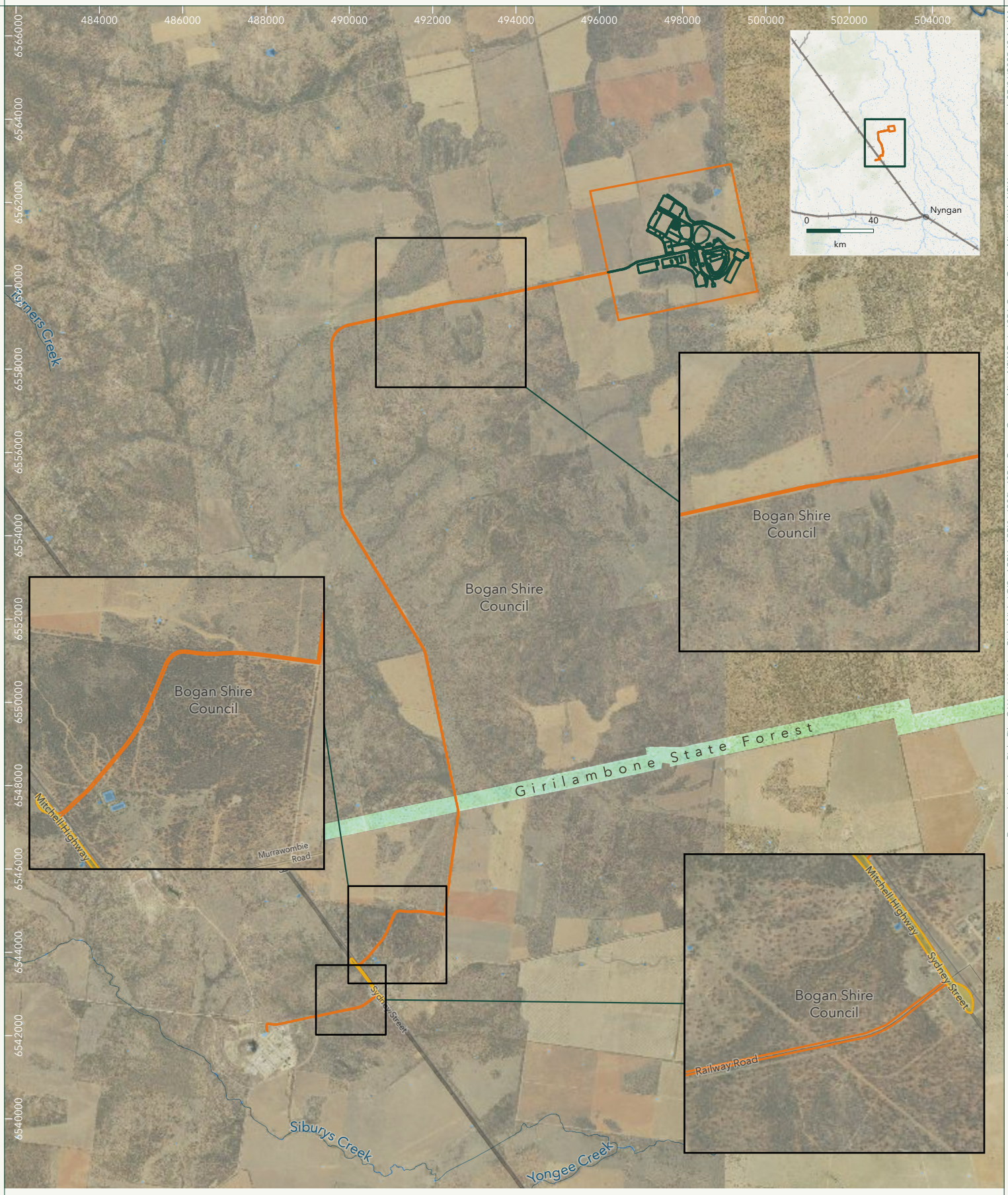
3 Inclusion of underground powerline in existing proposed 18 m infrastructure corridor	The amendment is for the inclusion of underground utilities from 0.75 m to 2.8 m. The proposed additional services will not impact any items or places of historical heritage significance. A minor adjustment to the footprint of the Mitchell Highway intersections to accommodate truck turning buffers, as requested by Transport for NSW (see Figure 3a).	

2.3 Environmental context

The amendments fall within the same environmental context as the original EIS assessment. Please refer to the HHA (Niche, 2024) for additional detail.

2.4 Historical land use

The amendments fall within the same land assessed as part of the original EIS assessment. Please refer to the HHA (Niche, 2024) for additional detail.



Subject area

Extent of mine precincts and components

Disturbance along Mitchell Highway

Transport

Major road

Rail

Hydrography

Waterbody

Protected Areas of NSW

State Forest

Administrative and Property Boundaries

Local Government Area

N

0 3

km

GDA2020 MGA Zone 55

Drawn by: HarrisonBinks File: C:\Users\HarrisonBinks\Niche\GIS - APRX - APRX\a6800\a6856 - Bogan Copper Mine NSW\Pro\a6856_BoganCopperMine_HHA_NSW.aprx Last updated: 27/06/2025 10:14 AM

Niche

Figure 1

Location map

Constellation Copper Mine

Niche PM: Caitlin McManus
Niche Proj. #: 6856
Client: Aens Resources

Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS/ World_Ocean_Base: NIWA, GeosciencesAustralia, Esri, GEBCO, Garmin, NaturalVue/ public/NSW_Imagery: © Department of Customer Service 2020/ World Hillshade: Esri, USGS | Watercourses, Waterbodies, Road and Rail alignments, Protected areas of NSW © Spatial Services 2021. | Niche uses GDA2020 as standard for all project-related data. In order to ensure that data from numerous sources and coordinate systems is aligned, on-the-fly transformation to GDA2020 MGA Zone 55 is used in the map above. For ease of reference, the grid tick marks and labels shown around the border of the map are presented in GDA2020 MGA Zone 55.

3. Summary and analysis of background information

3.1 Heritage Register Searches

3.1.1 Historical heritage registers

Searches of the Australian World Heritage Database, the Commonwealth Heritage List, the National Heritage List, the State Heritage Register, the State Heritage Inventory, the Bogan Shire Council LEP (2011) and the Bogan Shire Council Development Control Plan (DCP) were conducted on 17 June 2025.

No listed heritage items or places are present within the amendments (Figure 2). See Table 12 in Section 6.2 in the HHA (Niche, 2024) for the detailed results of the previous searches.

3.1.2 Recent investigations and results

Niche undertook an HHA that included an archaeological survey (site inspection), which was carried in conjunction with the Aboriginal cultural heritage surveys (completed in 2022, 2023, and 2025).

The site inspections identified no heritage items or historic sites within the Subject Area. Several potential heritage items were identified, including telegraph poles and a potential dump site; however, these items were later assessed as holding no heritage value.

Items including the Girilambone Railway Station and Loading Platform, a water tower and Girilambone Cemetery are located a significant distance outside the Subject Area and will not be impacted by works. The Subject Area represents a rural landscape, historically shaped by agricultural land use. The Subject Area has been extensively disturbed through mining, road construction and agricultural ploughing.

No areas of archaeological potential were identified within or immediately adjacent to the Subject Area.

The amendments fall within the same land assessed as part of the original EIS assessment. Please refer to the HHA (Niche, 2024) for additional detail.

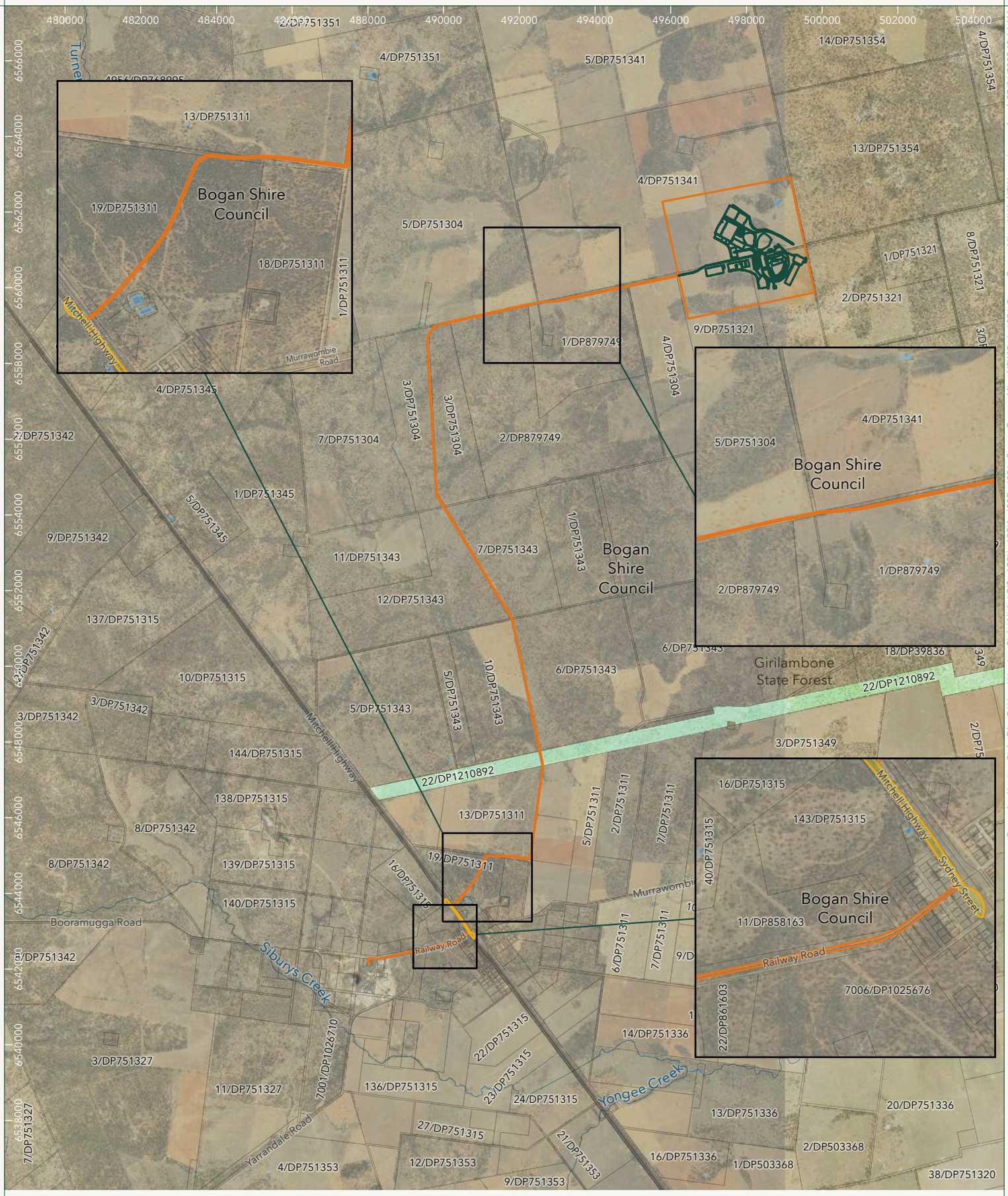


Figure 2

Historical heritage items and places

Constellation Copper Mine

Niche PM: Caitlin McManus
Niche Proj. #: 6856
Client: Aens Resources

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4. Analysis and discussion

4.1 Amendment 1: Haul road Crown Land avoidance

4.1.1 Previous assessment

Amendment 1 is situated within the previously surveyed Okeh Road survey unit and the Okeh South survey unit, and a portion of the unsurveyed section of Okeh Road (Figure 3 and Figure 4).

A full description of the two survey units is detailed in Section 4.2.1 and 4.2.2 in the original HHA report (Niche, 2024, pp. 27–33). The amended alignment is located where the two survey units meet along Okeh Road, adjacent the Okeh Road signed property entrance. The survey along Okeh Road covered a 20 m-wide corridor along the entire road, mostly conducted on foot, with vehicles used in highly disturbed or narrow sections. The area is bordered by the property access road to the north and by revegetated woodland and farmland to the south and southwest.

Part of the alignment extends beyond the original survey coverage; however, this unsurveyed section lies within the established Okeh Road corridor, which has been previously surveyed and documented in parts of the Subject Area. The Okeh Road is a substantially modified access route, with recognized alterations throughout its corridor.

The HHA (Niche, 2024) identified no historical heritage items or places are within the vicinity of the amended alignment.

4.1.2 Proposed impacts

A review of the proposed re-alignment has identified that no Historical heritage items or places are within the vicinity of the amended alignment. The proposed alignment will have no direct or indirect impacts on historical heritage items or places.

4.1.3 Proposed mitigation measures

No further recommendations or mitigation measures, beyond those detailed in the HHA (Niche, 2024) are required.

4.2 Amendment 2: Glendale alignment

4.2.1 Previous assessment

Amendment 2 is located within the previously surveyed Aeris Block (Bourke St to Glendale) survey unit (Figure 3 and Figure 4).

The Aeris Block survey unit, located within Lot 13 DP751311, Lot 19 DP751311, and Lot 2 DP 1296861, is a heavily modified plain bordered by Bourke Street and a rail line/reserve to the west, Girilambone residential blocks and water storage to the south and east, and agricultural land to the north.

The HHA (Niche, 2024) identified no historical heritage items or places are within the vicinity of the amended alignment.

4.2.2 Proposed impacts

A review of the proposed re-alignment has identified that no Historical heritage items or places are within the vicinity of the amended alignment. The proposed alignment will have no direct or indirect impacts on historical heritage items or places.

4.2.3 Proposed mitigation measures

No further recommendations or mitigation measures, beyond those detailed in the HHA (Niche, 2024) are required.

4.3 Inclusion of underground powerline in existing proposed 18 m infrastructure corridor

4.3.1 Previous assessment

Amendment 3 is located within the previously surveyed infrastructure corridor, including the haul road, Mitchells Highway, and the underground pipeline (5 m pipeline easement) within the Mine Access survey unit, located on Railway Road, between Mitchell Highway and the Murrawombie Copper Mine. The pipeline easement is a heavily modified haul road and road corridor. This survey unit represents a heavily modified plain landscape containing an existing bitumen roadway, frequented by heavy vehicles to and from the existing mine site (Niche, 2024, pp. 27–33).

The proposed haul route consists of 400 m of sealed roadway (Railway Road) between the current mine site to the Mitchell Highway and rail line immediately north of the Girilambone township. The remainder of the proposed haul route alignment is currently unsealed. Girilambone Station and associated rail infrastructure are located to the south of the haul road alignment. Further description of the Station and associated infrastructure is provided in Section 4.3.5 of the HHA report (Niche, 2024, pp. 36–37).

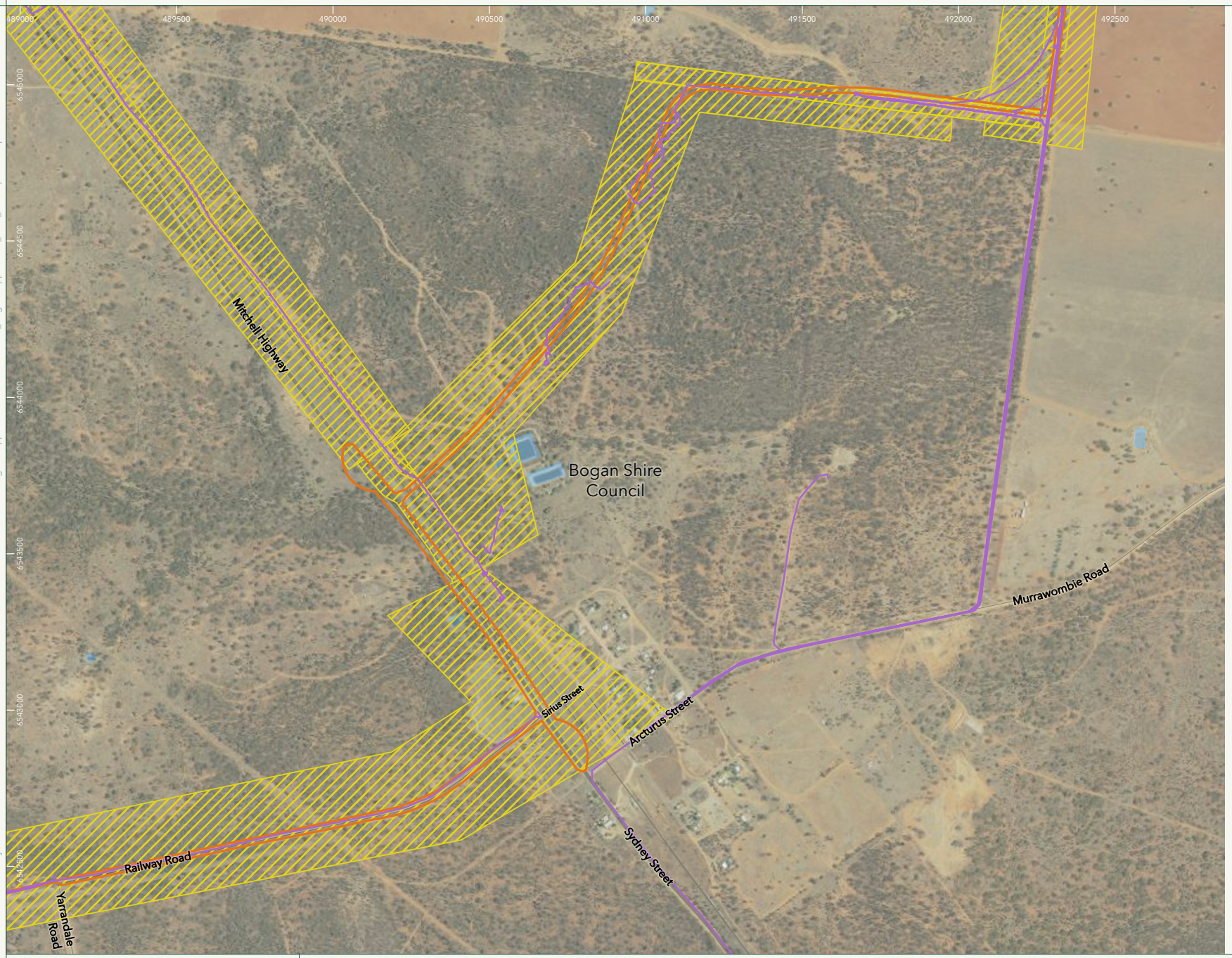
The HHA (Niche, 2024) identified no historical heritage items or places are within the vicinity of the amendment 3.

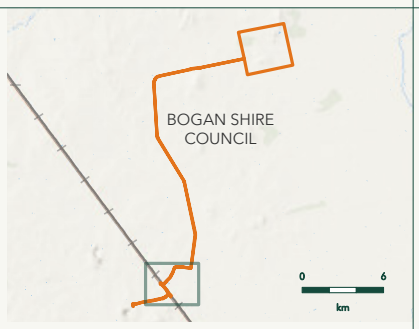
4.3.2 Proposed impacts

A review of the proposed amendment has identified that no Historical heritage items or places are within the vicinity of the amendment. The proposed amendment will have no direct or indirect impacts on historical heritage items or places.

4.3.3 Proposed mitigation measures

No further recommendations or mitigation measures, beyond those detailed in the HHA (Niche, 2024) are required.





Subject area
Survey tracks
Survey coverage

Transport
Major road
Minor road
Rail

Hydrography
Waterbody

Administrative and Property Boundaries
Local Government Area

Figure 3

Survey coverage

Constellation Copper Mine

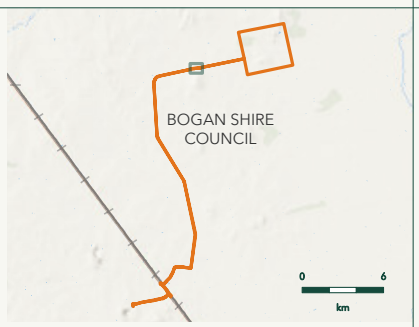
Niche PM: Caitlin McManus
Niche Proj. #: 6856
Client: Aens Resources

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Subject area
Survey tracks
Survey coverage

Transport

Minor road

Administrative and Property Boundaries

Local Government Area

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Figure 3

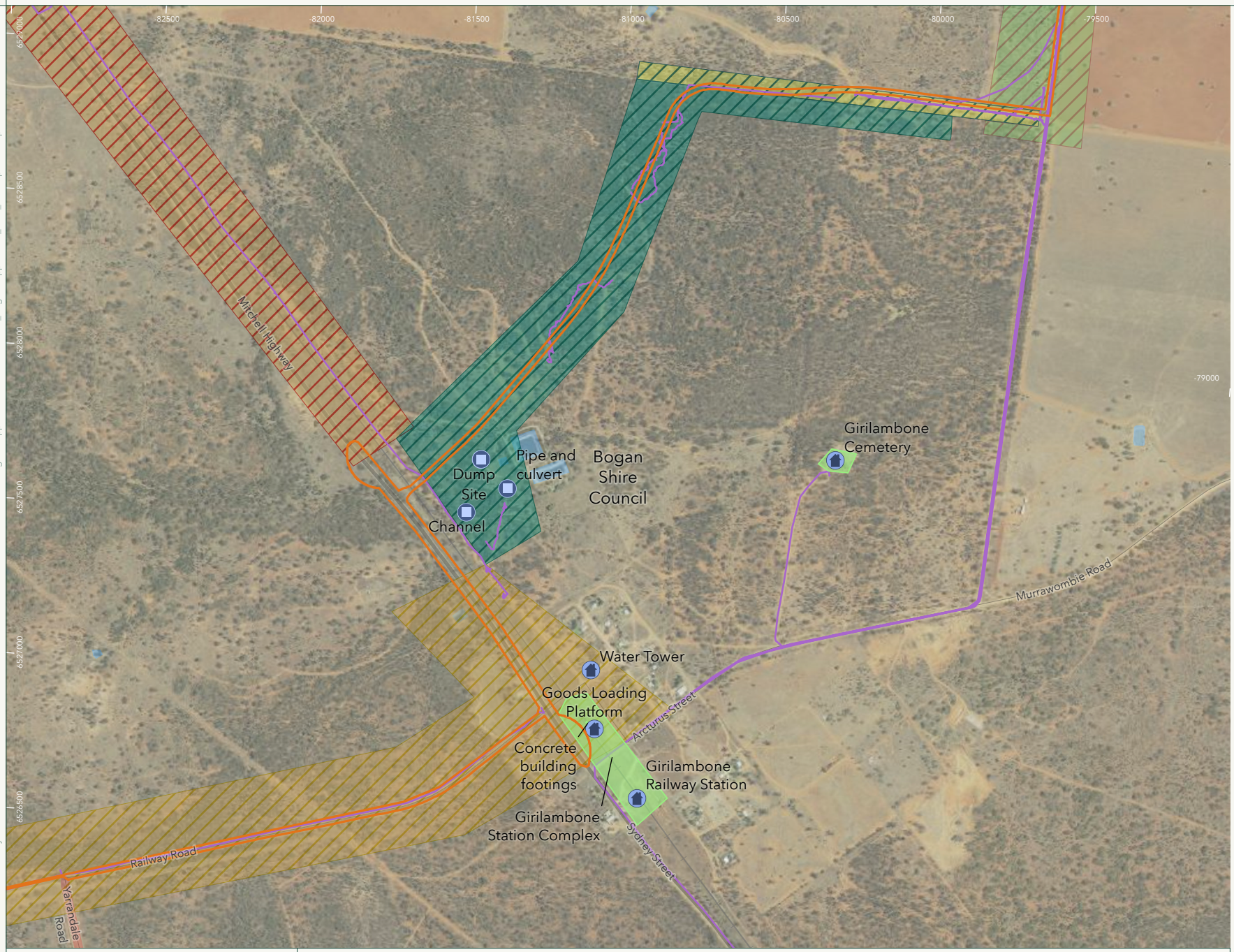
Survey coverage

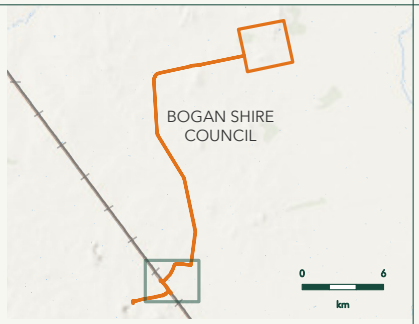
Constellation Copper Mine

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Niche Proj. #: 6856
Client: Aens Resources

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Subject area

Niche individual site feature

- Moveable heritage item
- Built heritage item
- Site feature area

Survey areas and effort

- Survey tracks
- Aeris Block
- Mine Access
- Mitchell Highway
- Okeh Road
- Haul Road Curve Option
- Aeris Block Plain
- Existing haul road (area not surveyed)
- Modified Plain
- Okeh Road
- Haul Road Curve Option

Transport

- Major road
- Minor road
- Rail

Hydrography

- Waterbody

Administrative and Property Boundaries

- Local Government Area

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GDA2020 MGA Zone 55

Figure 4

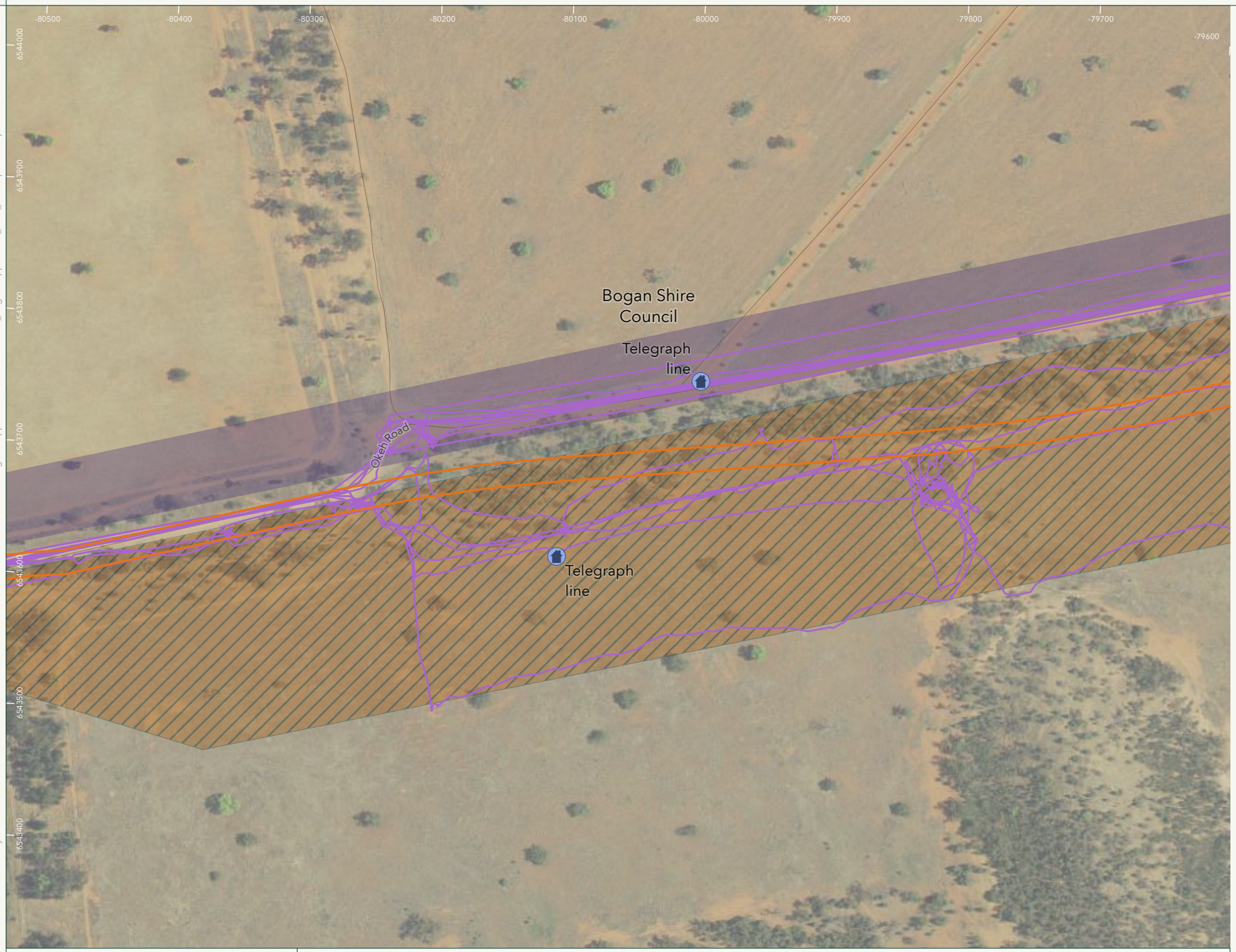
Survey results

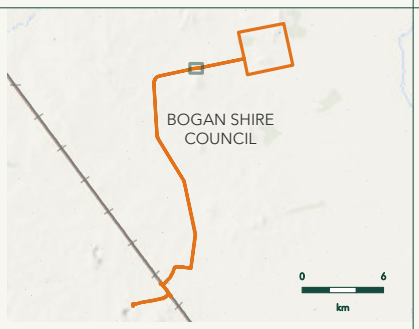
Constellation Copper Mine

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Subject area

Niche individual site feature

Built heritage item

Survey areas and effort

Survey tracks

Okeh South

Okeh Area 1 Modified Plain

Undulating Plain

Transport

Minor road

Administrative and Property Boundaries

Local Government Area

Figure 4

Survey results

Constellation Copper Mine

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Niche Proj. #: 6856
Client: Aens Resources

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GDA2020 MGA Zone 55

Hillshade: Sources: Esri, Maxar, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap, and the GIS user community/ World_Ocean_Base: NIWA, GeosciencesAustralia, Esri, GEBCO, Garmin, NaturalVue/ public/NSW_Imagery: © Department of Customer Service 2020/ Hillshade: Esri, CGIAR | Watercourses, Waterbodies, Road and Rail alignments, Protected areas of NSW © Spatial Services 2021. | Niche uses GDA2020 as standard for all project-related data. In order to ensure that data from numerous sources and coordinate systems is aligned, on-the-fly transformation to GDA2020 MGA Zone 55 is used in the map above. For ease of reference, the grid tick marks and labels shown around the border of the map are presented in GDA2020 MGA Zone 55. | Print Date: 27/06/2025

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5. Conclusion and recommendations

Niche was commissioned by AARC Pty Ltd on behalf of Aeris Resources Pty Ltd to prepare this Addendum to the HHA (Niche, 2024) to assess the EIS proposed amendments. This Addendum to the HHA was prepared to the inform the Amendment Report.

An assessment of the potential impact of the proposed amendments and associated ground disturbance indicates that the proposed amendments will have no direct or indirect impact on items or places of historical heritage significance. Therefore, the proposed amendments will not affect the historic heritage values within or adjacent to the Subject Area.

No further recommendations or mitigation measures, beyond those detailed in the HHA (Niche, 2024) are required.

References

McQueen, K.G., 2002. Mining History of the North-East Lachlan-Macquarie Region, New South Wales.
Niche, 2024. Constellation Copper Mine, Bogan, NSW: Historical Heritage Assessment (HHA No. 6856). Report prepared for AARC Pty Ltd on behalf of Aeris Resources Pty Ltd, Brisbane QLD.

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SOCIAL IMPACT ASSESSMENT – CONSTELLATION PROJECT

SIA REPORT - ADDENDUM

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Addendum Report

TAP Consulting	
Date of Report:	07.08.2025
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Prepared for:

aarc ENVIRONMENTAL SOLUTIONS

Document History

VERSION	DATE OF ISSUE	PERSON	ACTION
0.1	14.07.2025	Thao Ashford	Draft for comments
0.2	07.08.2025	Thao Ashford	Final

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1.0 Introduction

In May 2024, TAP Consulting completed the Social Impact Assessment (SIA) for the development of the Constellation Project (the Project). The Social Impact Assessment (SIA) has been prepared for Aeris to support the Environmental Impact Statement (EIS) for a State Significant Development (SSD) project where a development consent is required.

Aeris submitted the development application to the department in July 2024, accompanied by the EIS. The EIS was publicly exhibited between 15 August 2024 and 11 September 2024 to seek opinions from the government agencies, local councils, and the community. As an outcome of engineering design refinements and stakeholder engagement, Aeris is now seeking to amend the Project description and the EIS, to change aspects of the Project. The amendments include minor corridor realignments, inclusion of underground powerline, minor change to the footprint of the Mitchell Highway intersection and revised construction operation hours.

This report serves as an addendum to the *Social Impact Assessment – Constellation Project Report 2024* and addresses the proposed amendments to the EIS as they relate to social impacts. Much of the original assessment remains valid, particularly with respect to the existing policy and social contexts, the identified social impacts and subsequent mitigation measures. This Addendum should be read in conjunction with the original *Social Impact Assessment – Constellation Project Report 2024*, to provide a full understanding of the social impact assessment that has been undertaken for the Project.

2.0 Proposed Amendments & Associated Social Impacts

The proposed amendments are detailed in the table below and references the relevant sections of the SIA Report (2024). An assessment has been made as to whether the proposed amendments will result in any further social impacts.

Amendment	Description	Relevant Section in the SIA Report (2024)	Social Impacts

Realigning the infrastructure corridor around the crown land lot 10DP48604 (refer to attachment A)	Re- alignments have been designed to accommodate road-registered trucks, sized up to AB triples with 70 t payloads.	Section 6.0 Impact Assessment Prediction
		• Section 6.1 Way of Life
		  ○ Road works, Road network and local traffic
		• Section 6.3 Accessibility
		  ○ Road Network
			The following is noted from the Transport Impact Assessment Addendum (Stantec 2025):
			• *The revised alignment does not affect the public road network and maintains the safety and functionality of the previously proposed alignment, with no anticipated adverse impacts on traffic operations or road safety.*
			
			The following is noted from the Air Quality and Noise Addendum (Todoroski Air Services, 2025):
			• *The EIS amendments are not expected to result in any additional dust. The infrastructure corridor realignments generally follow the original alignment, deviating by approximately 50m, and are considered relatively minor. Given the nearest residential receptors are located more than 1 kilometre (km) from the realignment areas, the changes are expected to have a negligible impact in terms of air quality.*
			• *Similar to the air assessment, the proposed infrastructure corridor*

Amendment	Description	Relevant Section in the SIA Report (2024)	Social Impacts
			realignments do not deviate substantially from the original alignment substantially and are therefore expected to result in negligible noise impacts at the nearest residential receptors. The proposed realignment does not result in any changes to social impacts.

Realigning the infrastructure corridor associated with Lot 13 DP751311, Lot 19 DP751311, and Lot 2 DP1296861 (refer to attachment B)	To redesign road curves and accommodate road registered trucks sized up to AB triples re- alignments with 70 t payloads.	Section 6.0 Impact Assessment Prediction
		• Section 6.1 Way of Life
		  ○ Road works, Road network and local traffic
		• Section 6.3 Accessibility
		  ○ Road Network
			As above.

Inclusion of underground powerline in existing proposed 18 m infrastructure corridor (refer to attachment C)	The amendment is associated within the existing infrastructure corridor that was proposed to be constructed from Murrawombie to the Constellation mine site. The proposed underground powerline would be located within the proposed disturbance (18 m wide) in the EIS.	Not assessed as part of the Social Impact Assessment.	Not assessed as part of the Social Impact Assessment.

A minor change in the footprint of the Mitchell Highway intersections for truck turning area is also proposed. (refer to attachment D)	The original proposed infrastructure corridor from the project site to the Tritton Copper Mine, included a new T intersection to link the proposed infrastructure corridor with the eastern side of the Mitchell Highway (north of Girilambone) and an upgrade to the intersection of the Mitchell Highway with Railway Road (west of Girilambone).
	
	The intersections between the proposed infrastructure corridor and the Mithell highway have been redesigned based on
		Section 6.0 Impact Assessment Prediction
		• Section 6.1 Way of Life
		  ○ Road works, Road network and local traffic
		• Section 6.3 Accessibility
		  ○ Road Network
			The following is noted from the Transport Impact Assessment Addendum (Stantec 2025):
			• *Considering there are no major changes to the proposed intersections on Mitchell Highway the amendments are considered appropriate and maintains its suitability for its intended use. Further, the changes do not alter*

Amendment	Description	Relevant Section in the SIA Report (2024)	Social Impacts
	engineering designs including Channelised Right Hand Turns and sweep paths. The proposed intersections modifications were engineered to comply with the Austroads Guidelines to Road Design and recommendations from Transport for NSW. Revised designs include improvements to road curves to accommodate road-registered trucks, sized up to AB triples with payloads of up to 70 tonnes, traveling at a speed of 20- 30 km. By following engineering recommendations and the Austroads Guide to Road Design Part 3: Geometric design (Fanning, 2021), proper geometric design – including lane widths, curves and sight distances – ensures that the proposed infrastructure corridor is safe by: • allowing vehicles to navigate turns safely at appropriate speeds; • providing sufficient stopping sight distance; and • reducing the likelihood of run-off and head-on crashes		*the Constellation Project TIA(Stantec,2024) outcomes.* The proposed realignment does not result in any changes to social impacts.

Revising the construction operation hours to 24 hours per day, seven days a week	The original hours of operation included the following:
	• Mining operations and haulage activities are proposed to occur 24 hours a day, 7 days a week.
	• Construction activities during the Project's construction phase will be undertaken between 06:00 am and 10:00 pm seven days a week.
	
	The proposed amended hours of operation include the following:
	• Mining operations and haulage activities are proposed to occur 24 hours a day, 7 days a week.
	• **Construction activities during the Project's construction phase will be undertaken 24 hours a day.**
		Section 6.0 Impact Assessment Prediction
		• Section 6.1 Way of Life
		  ○ Road works, Road network and local traffic
		• Section 6.2 Amenity
		  ○ Amenity and Lifestyle
		• Section 6.5 Health and Wellbeing
		  ○ Physical Health
		• Section 6.6 Surroundings
		  ○ Visual Amenity
			The following is noted from the Transport Impact Assessment Addendum (Stantec 2025):
			• *It is not anticipated that the extended construction hours would alter predicted construction delivery vehicle frequency or construction peak hour traffic movements, as outlined in Section 4.2 of the Constellation Project TIA (Stantec 2024). The Extended construction hours would allow works to be undertaken during low traffic periods, reducing any traffic impacts of the project.*

Amendment	Description	Relevant Section in the SIA Report (2024)	Social Impacts
	The main reasons that Aeris is seeking to extend the construction work hours for the Project is: • for construction, including constructing the new haul road and installation of the infrastructure corridor, when traffic is minimised at night. • to manage unpredictable, inclement weather, ensuring mitigations can be implemented as soon as possible once suitable weather conditions permit. • to provide flexibility for alternate work front availability, in the event that access to certain areas is restricted due to unforeseen circumstances. • to respond to changes in production schedules, including accelerated timelines driven by first production ore demands; and • addressing a combination of the above factors or other project-driven requirements that may arise. The activities to be undertaken during the construction stage of the Project include developing: • the mine site, including site preparation, clear and grade and earthworks for all pads, including the mining infrastructure area and surface infrastructure (EIS Chapter 3, Section 3.9.1.1); • the 2,850 m section of the new road for site access to bypass Girilambone town and upgrading existing roads in the infrastructure corridor (EIS Chapter 3, Section 3.9.1.2); • the underground water supply pipeline between the Project mine site and the Murrawombie Copper Mine in the infrastructure corridor (EIS Chapter 3, 3.9.1.2); • water management infrastructure, including clean water diversions, dirty water diversions and water		The following is noted from the Air Quality and Noise Addendum (Todoroski Air Services, 2025): • ***Air Quality Assessment*** *– The shift to 24-hour construction may reduce the potential for atmospheric dispersion of dust during night-time periods. While this could increase the potential for dust impacts in areas immediately adjacent the construction zone, the effect at more distant receptor locations is expected to remain negligible.* • *Importantly, enabling construction to proceed during night hours will allow works, particularly those along the public roads and nearest to residential receptors, to be completed quickly, thereby reducing the duration and potential for dust related impacts or nuisance. Limiting construction to daytime hours would extend the overall duration of works and potentially increase the dust exposure at receptor locations.* • *Dust emissions from these activities are expected to be easily managed through standard mitigation measures. These measures will be formalised in a Construction Dust Management Plan for the Project.* • ***Noise Assessment*** *– The modelling results indicate that several receptors,*

Amendment	Description	Relevant Section in the SIA Report (2024)	Social Impacts
	storage facilities and pipelines (EIS Chapter 3, Section 3.8.4); • buildings and installing the heap leach facilities, paste plant, stockpile area and the other site facilities, such as offices and emergency facilities, laydowns, solar farm and power station, explosives storage area identified in EIS Chapter 3, Section 3.7; and • the box cut and portal to enable underground access development, then the decline and underground workings, the underground ventilation system and underground mining infrastructure (EIS Chapter 3, Section 3.6).		*primarily those located in the township of Girilambone due to Zone 3, as well as one receptor (R1) located near the infrastructure corridor in Zone 2, are predicted to experience noise levels above the applicable noise management level (RBL + 5 dB(A)).* The proposed changes to construction operation hours will result in changes to social impacts relating to amenity, lifestyle and health. The social impacts as a result of proposed changes are documented below.

3.0 Social Impact Assessment of Revised Construction Hours

The proposed changes to construction operation hours to allow works 24 hours per day, outside the EIS proposed construction hours of 6am to 10pm, seven days a week, will have additional negative impacts on amenity, lifestyle and health of the community particularly sensitive receptors. The SIA Report (2024) identified 3 impacts relating to amenity, lifestyle and health as per the tables below. All impacts were assessed as negative, for the life of the project (both construction and operations), with almost certain likelihood of occurring, with a magnitude rating of minor and overall significance of medium (before mitigation measures).

Table 1. Community – Amenity and Lifestyle (Section 6.2)

Project Activity: Amenity and Lifestyle		
Impact	**Nature**	Negative
The amenity of residents living near the Project (including the haul road) may be impacted by noise, vibration, dust which may affect their lifestyles e.g. willingness to use outdoor areas	**Project Phase**	Life of Project
	Likelihood	Almost Certain
	Magnitude	Minor
	Significance	Medium

Table 2. Health and Wellbeing – Physical Health (Section 6.5)

Project Activity: Physical Health		
Impact	**Nature**	Negative
Noise, vibration and dust impacts for residence close to the Project and haul road may cause irritation and decrease personal health	**Project Phase**	Life of Project
	Likelihood	Almost Certain
	Magnitude	Minor
	Significance	Medium

Table 3. Surroundings – Visual Amenity (Section 6.6)

Project Activity: Visual Amenity		
Impact	**Nature**	Negative
Some visual amenity (and lighting) impacts will occur to Sensitive Receptors located along the haul road.	**Project Phase**	Life of Project
	Likelihood	Almost Certain
	Magnitude	Minor
	Significance	Medium

With the proposed changes to construction operation hours to 24 hours and although for a short period of time (e.g. construction phase), the changes represent a possibility of intense activity outside of the EIS proposed construction hours of 6am to 10pm, seven days a week) resulting in adverse impacts to sensitive receptors.

It is noted in the Air Quality and Noise Addendum, 2025 that construction activities occurring at the Project site during night-time periods are expected to generate similar or less noise than those assessed under the operational scenario in the Noise Impact Assessment Report (2024) and therefore complies with the relevant noise management levels. Further noise assessment is focused on construction activities associated with the infrastructure corridor including corridor preparation and widening, installation of the underground water supply pipeline and buried power cable, and road upgrades. It is noted that the corridor preparation and widening works represent the highest noise generation potential.

The predicted noise level assessment for construction outside of the EIS proposed construction hours of 6am to 10pm, seven days a week undertaken by Todoroski Air Science, 2025 indicated that several residential receptors are predicted to experience levels above the applicable noise management level. The following is noted:

- Level above management level >5 to 15 = 8 sensitive receptors
- Level above management level >15 to 25 = 3 sensitive receptors
- Level above management level >25 = 1 sensitive receptors

As noted above, sensitive receptors living in close proximity to the infrastructure corridor construction site would be exposed to disturbances that will impact their amenity (lights and noise at construction site) and the proposed 24hours operation could prolong that impact. Prolonged activity, all hours of the night, from the construction site can potentially impact on resident's ability to relax at home, night-time peacefulness and undisturbed sleep. Sleep disturbance could impact people's capacity to go about their day to day lives including, work, education, recreation and social activities, which has health impacts. There is a wide range of research[1][2][3][4] on the negative consequences of insufficient sleep which demonstrate that there are detrimental impacts on physical and mental health, daytime alertness, mood, work performance and may increase the risk of serious accidents and injury.

It is acknowledged that amenity values can be highly subjective and the degree to which sensitive receptors would experience social impacts due to amenity changes with the proposed changes to construction hours would vary between individuals. For example, what may have amenity value for one person, may not be valued by another. Similarly, people have different levels of perception or tolerance for things that may impact amenity based on factors, such as, perception, distance from the construction site, and the value which people attach to the amenity and character of their community. Consultation feedback from landowners (although not specifically relating to proposed 24hour construction period) indicates an underlying concern with disturbances to amenity as a result of the

1 Adams at el (2016), *Sleep Health of Australian Adults in 2016: results of the 2016 Sleep Health Foundation national survey. Available* https://www.ncbi.nlm.nih.gov/pubmed/28346149

2 Hillman, R D (2013), *Public Health Implications of sleep loss: the community burden, 2013 Available* https://www.mja.com.au/system/files/issues/199_08_211013/lac10620_fm.pdf

3 Better Health Victoria (2020), *Sleep Deprivation.* Accessed https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/sleep-deprivation?viewAsPdf=true

4 Sleep Health Foundation (2019), *Addressing Inadequate sleep in the Australian community, 2020*

Constellation project for example, loss of property amenity e.g. peace and quiet and disruption due to operations e.g. noise, dust.

In addition to the identified 3 impacts relating to amenity, lifestyle and health (which remains unchanged from the SIA Report 2024), an additional social impact has been added under the social impact category of Health and Wellbeing – Physical Health (refer to Table 4).

Table 4. Health and Wellbeing – Physical Health – New Social Impact

Project Activity: Physical Health		
Impact	**Nature**	Negative
Noise and vibration impacts for residence close to the infrastructure corridor including ability to relax at home, night-time peacefulness and undisturbed sleep.	**Project Phase**	Construction
	Likelihood	Almost Certain
	Magnitude	Moderate
	Significance	High

4.0 Social Impact Enhancement, Mitigation & Residual Impacts for Revised Construction Hours

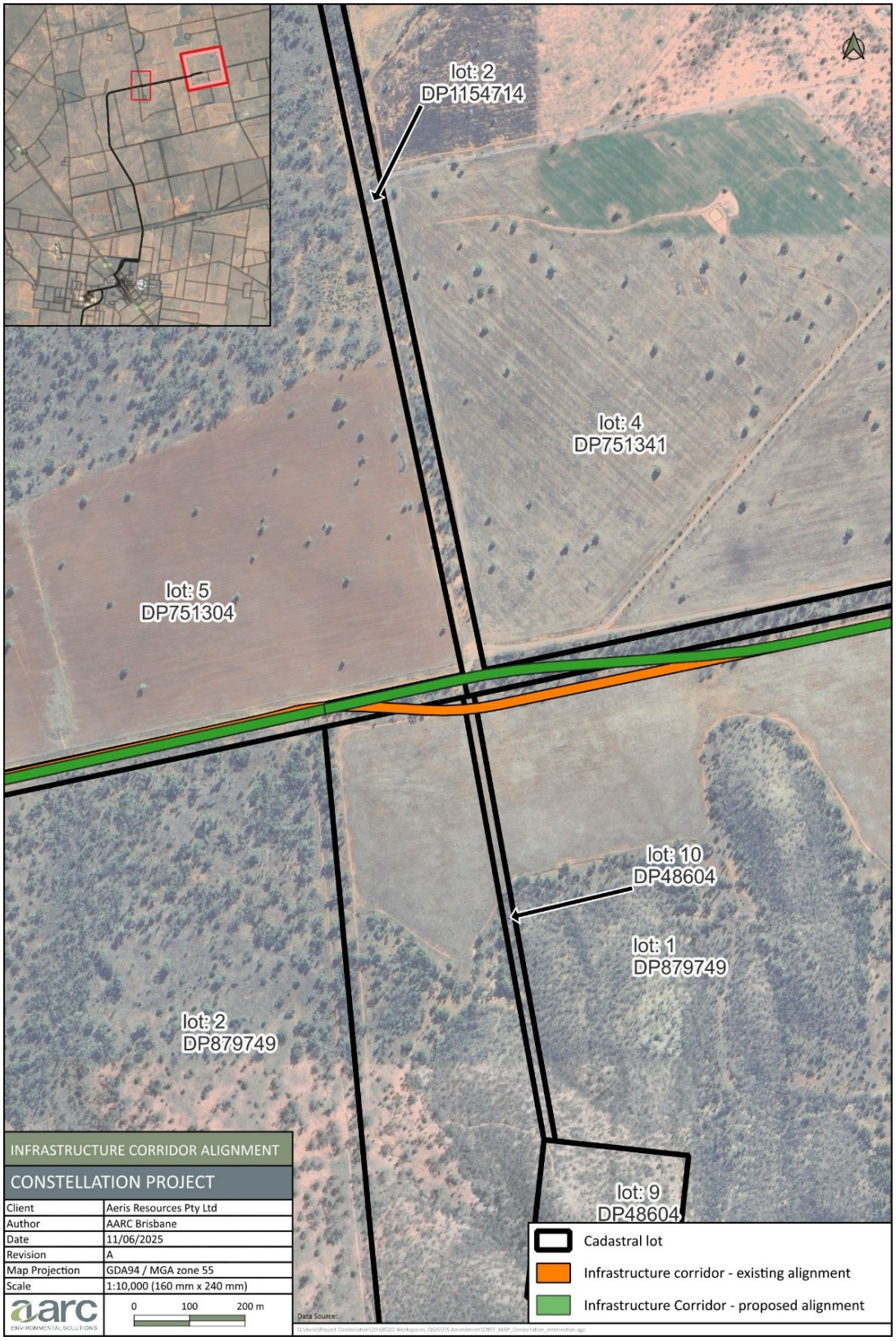
Table 5 outlines the recommended mitigation measures for the revised construction hours and the corresponding residual impact if mitigation strategies are adopted. The Air Quality and Noise Addendum, 2025 provides a comprehensive list of mitigation measures and in addition to these, others have also been recommended. The impacts of the revised construction hours can be reasonably mitigated and achieve a residual impact significance of medium.

Table 5. Recommended Mitigation and Enhancement Strategy and Residual Impact for Revised Construction Hours

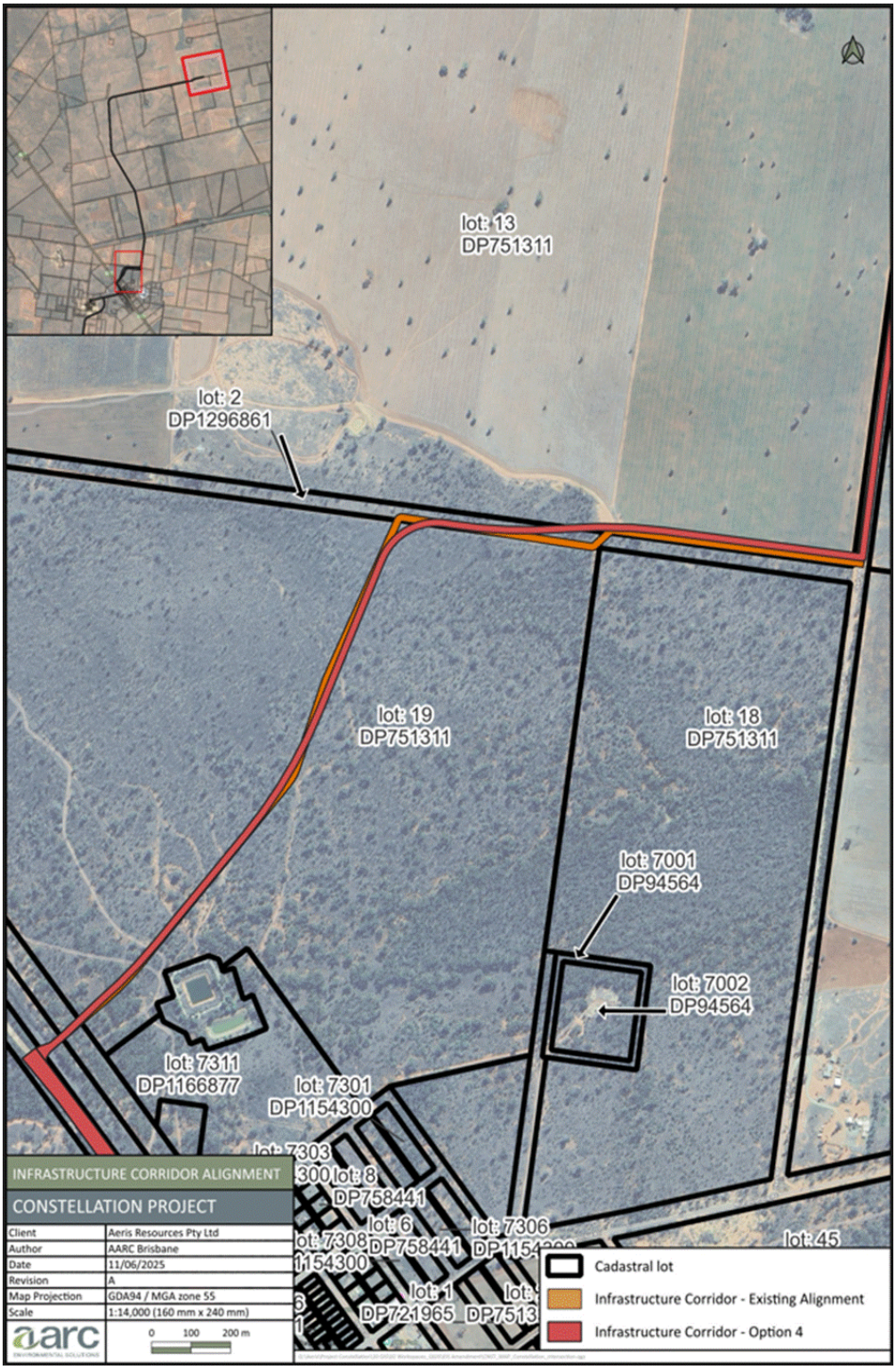
Project Activity	Impact	Impacted Stakeholders	Impact Significance Pre-mitigation (nature)	Recommended mitigation or enhancement strategy	Residual impact significance
Health and Wellbeing					
Physical Health	Noise and vibration impacts for residence close to the infrastructure corridor including ability to relax at home, night-time peacefulness and undisturbed sleep.	Sensitive Receptors R1, R5, R15, R17 – R25	High (Negative)	1. Construction Noise Management Plan be developed, incorporating the final construction methods, equipment, and schedule. The Construction Noise Management Plan should ensure that appropriate mitigation and consultation strategies are implemented to effectively manage potential noise impacts at sensitive receptor locations. Refer to Air Quality and Noise Addendum, 2025 for list of mitigation measures. 2. All residential receptors receive some form of engagement, with additional targeted measures provided to those predicted to experience noise levels exceeding the applicable noise management level. Refer to Air Quality and Noise Addendum, 2025 for list of mitigation measures. 3. Prior to construction works commencing, clear communication channels shall be established	Medium (Negative)

Project Activity	Impact	Impacted Stakeholders	Impact Significance Pre-mitigation (nature)	Recommended mitigation or enhancement strategy	Residual impact significance
				between the project proponent and those persons and organisations in the community potentially affected by the construction of the infrastructure corridor. The receptors nominated for community consultation shall be guided by the prediction of noise and vibration impacts, particularly sensitive receptors exceeding upper limits for noise and/or vibration. This is particularly important where activities with potential for high levels of disruption, such as blasting, piling or night work will be required. 4. The project shall establish an effective documented complaints handling procedure which provides a fair and quick response to complaints. A complaint handling procedure shall include the following: a. A dedicated phone line b. A central point of contact c. A register of complaints shall be maintained, including time, date, location, person's contact details and any details regarding construction activities which are the focus of the complaint d. Reporting procedures	

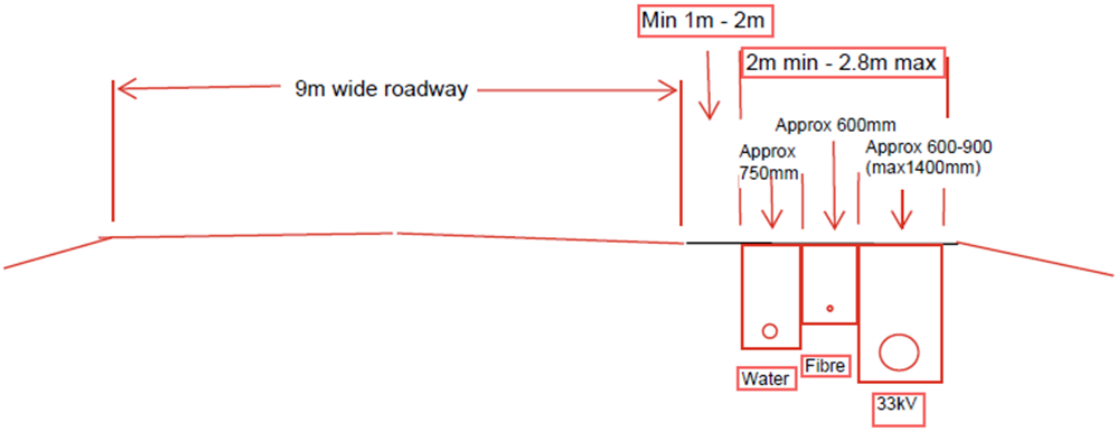
5.0 Attachment A – Infrastructure realignment on lot 10 DP48604



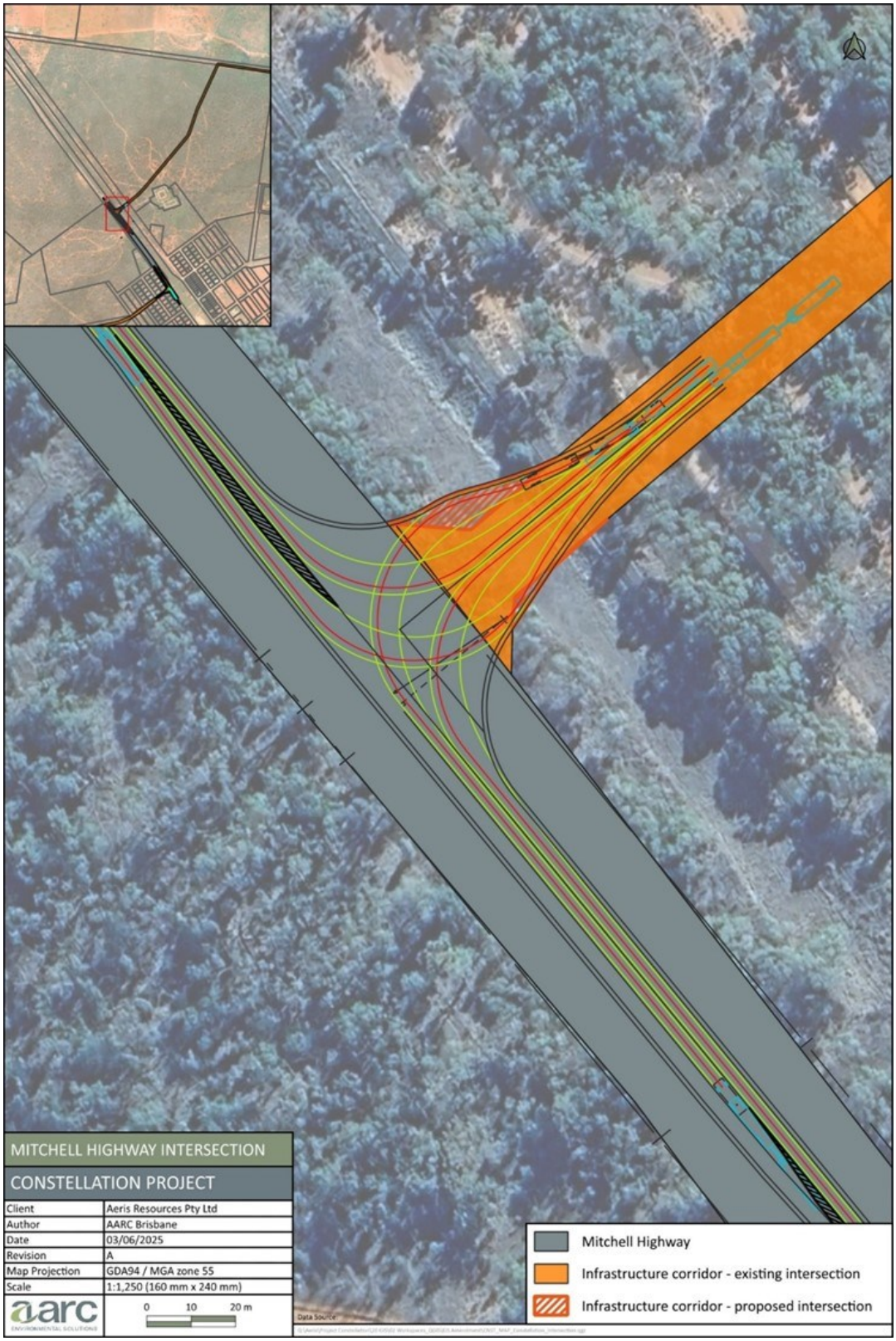
6.0 Attachment B - Infrastructure Realignment on lot 13 DP751311, lot 2 DP1296861, and lot 19 DP751311

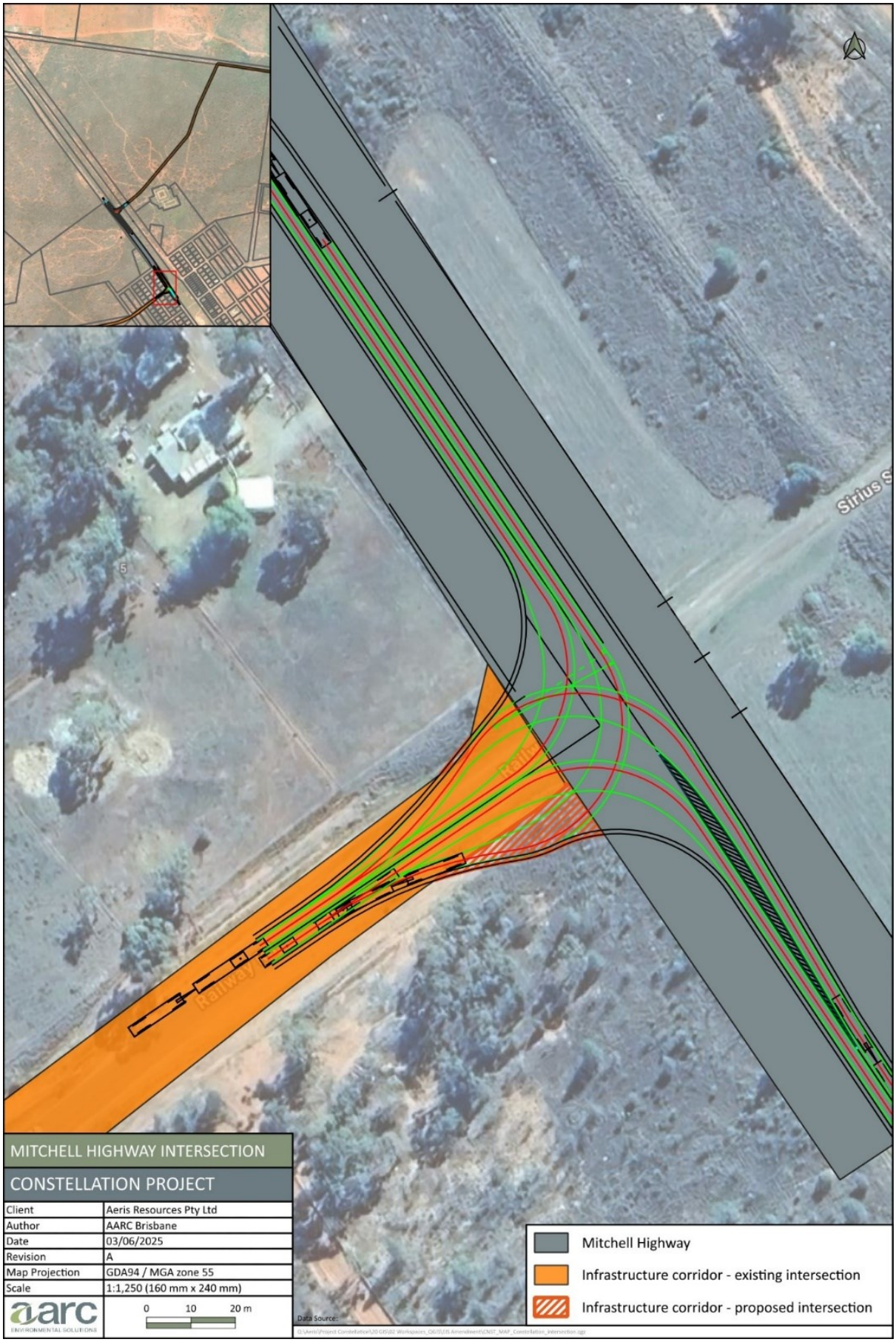


7.0 Attachment C - Inclusion of underground powerline within existing EIS proposed infrastructure corridor



8.0 Attachment D - Mitchell Highway Intersections Amendments




MITCHELL HIGHWAY INTERSECTION
CONSTELLATION PROJECT
Client | Aeris Resources Pty Ltd
Author | AARC Brisbane
Date | 03/06/2025
Revision | A
Map Projection | GDA94 / MGA zone 55
Scale | 1:1,250 (160 mm x 240 mm)
0 10 20 m
Data Source:
Mitchell Highway
Infrastructure corridor - existing intersection
Infrastructure corridor - proposed intersection

AEC Group Pty Ltd (Brisbane)
Level 5, 131 Leichhardt Street
Spring Hill QLD 4000
ABN: 84 087 828 902

8 August, 2025

RE: CONSTELLATION PROJECT ECONOMIC IMPACT ASSESSMENT – ADDENDUM

AEC authored an economic impact assessment for Aeris Resources Ltd's (Aeris) Constellation Project (the Project) as a technical report supporting an Environmental Impact Statement (EIS) for the Project. The economic impact assessment, finalised in May 2024, quantified the expected beneficial and adverse economic impacts of the Project on the regional and state economies, addressing the Secretary's Environmental Assessment Requirements (SEARs) for the EIS as it pertained to economic impacts.

Since completion of the economic impact assessment, Aeris has progressed and submitted the EIS. Since this time, and as an outcome of engineering design refinements and stakeholder engagement, Aeris have identified the following changes that they would like to make prior to decision, as an amendment to the Project:

- Two infrastructure corridor realignments.
- Inclusion of underground powerline in the existing proposed infrastructure corridor.
- Minor amendments to the footprint of the Mitchell Highway intersections for truck turning area.
- Revising the construction operation hours to 24 hours per day.

This addendum letter examines the implications of these amendments on the findings of the economic impact assessment. Note that this addendum should be read in conjunction with the economic impact assessment report authored by AEC (2024).

Yours sincerely



Kieron Lacey
Technical Director – Economics
E: kieron.lacey@aecgroupltd.com
T: 1300 799 343

ENCLOSURE A: IMPLICATIONS FOR ECONOMIC IMPACT ASSESSMENT

This section examines the proposed amendments to the Project and examines the implications of these changes on the assessed economic impacts in Chapter 5 (Local Effects Analysis) of AEC's economic impact assessment of the Constellation Project.

DESCRIPTION OF AMENDMENTS

INFRASTRUCTURE CORRIDOR REALIGNMENTS

The following two infrastructure corridor realignments are proposed:

- Amendment 1: Realigning the infrastructure corridor around the crown land lot 10DP48604 (Figure 1 in Enclosure B):
    - Realignments have been designed to accommodate road-registered trucks, sized up to AB triples with 70 tonne (t) payloads.
- Amendment 2: Realigning the infrastructure corridor associated with Lot 13 DP751311, Lot 19 DP751311, and Lot 2 DP1296861 (Figure 2 in Enclosure B):
    - To redesign road curves.
    - Accommodate road registered trucks sized up to AB triples with 70t payloads.

INCLUSION OF UNDERGROUND POWERLINE

Aeris are proposing to include an underground powerline within the existing proposed 18m infrastructure corridor:

- The amendment is associated within the existing infrastructure corridor that was proposed to be constructed from Murrawombie to the Constellation mine site.
- The proposed underground powerline would be located within the proposed disturbance (18m wide) in the EIS (Figure 3 in Enclosure C).

CHANGE IN FOOTPRINT OF MITCHELL HIGHWAY INTERSECTIONS

A minor change in the footprint of the Mitchell Highway intersections for truck turning area is proposed:

- The original proposed infrastructure corridor from the project site to the Tritton Copper Mine, included a new T intersection to link the proposed infrastructure corridor with the eastern side of the Mitchell Highway (north of Girilambone) and an upgrade to the intersection of the Mitchell Highway with Railway Road (west of Girilambone).
- The intersections between the proposed infrastructure corridor and the Mitchell highway have been redesigned based on engineering designs including Channelised Right Hand Turns and sweep paths. The proposed intersection modifications were engineered to comply with the Austroads Guidelines to Road Design and recommendations from Transport for NSW. Revised designs include improvements to road curves to accommodate road-registered trucks, sized up to AB triples with payloads of up to 70 tonnes, traveling at a speed of 20- 30 km. This will improve safety by:
    - Allowing vehicles to navigate turns safely at appropriate speeds.
    - Providing sufficient stopping sight distance.
    - Reducing the likelihood of run-off and head-on crashes.
- The proposed modifications represent an insignificant increase in disturbance area of around 0.02 ha per intersection (0.04 total). Figure 4 in Enclosure D shows the proposed modification to the new T intersection to link the corridor with the eastern side of the Mitchell Highway, and Figure 5 in Enclosure D shows the proposed modification to the intersection of the Mitchell Highway with Railway Road.

REVISED CONSTRUCTION HOURS

The Project description in the EIS proposed surface construction activities to generally be undertaken during the hours of 6 am to 10 pm, seven days a week.

Aeris propose to amend those hours to 24 hours per day, seven days a week. The main reasons that Aeris is seeking to extend the construction work hours for the Project is:

- For construction, including constructing the new haul road and installation of the infrastructure corridor, when traffic is minimised at night.
- To manage unpredictable, inclement weather, ensuring mitigations can be implemented as soon as possible once suitable weather conditions permit.
- To provide flexibility for alternate work front availability, in the event that access to certain areas is restricted due to unforeseen circumstances.
- To respond to changes in production schedules, including accelerated timelines driven by first production ore demands.
- Addressing a combination of the above factors or other project-driven requirements that may arise.

IMPLICATIONS FOR THE ECONOMIC IMPACT ASSESSMENT

SECTION 5.1 – CONTRIBUTION TO THE ECONOMY

5.1.1 – CONSTRUCTION

No material change.

Advice from Aeris is that no material change to construction costs or timelines is anticipated as a result of the proposed amendments. While some timeframes may be compressed as a result of the 24 hour/ 7 days a week construction profile, overall it is anticipated that work will be spread out over the additional work hours with negligible overall change in construction timelines.

With no material change in the construction activity anticipated, the economic activity estimated in section 5.1.1 of the economic impact assessment is considered to remain a relevant reflection of the economic activity that may be expected from construction of the Project.

5.1.2 – OPERATIONS

No material change.

The proposed amendments are not anticipated to have any impact on operating activity and economic activity supported by operations of the Project. As such, the economic activity estimated in section 5.1.2 of the economic impact assessment report is considered to remain a relevant reflection of the economic activity that may be expected from operations of the Project.

SECTION 5.2 – IMPACTS TO BUSINESS

5.2.1.1 – BENEFITS TO BUSINESS UPSTREAM IN THE SUPPLY CHAIN

No material change.

With no material change in construction or operating activity/ expenditure, there is not anticipated to be any change to the implications of this section.

5.2.2.1 – IMPACTS ON BUSINESS FROM COMPETITION FOR RESOURCES

No material change.

It is unlikely that the change in construction hours will have any material implications in terms of impacts on other businesses through competition for resources. The overall construction effort is not anticipated to change, and while some elements of construction may be compressed, overall the approach will be to spread the working requirements across the additional work hours with minimal impact on the number of workers required.

5.2.2.2 – IMPACTS ON AGRICULTURAL PRODUCTIVITY

No material change.

The disturbance footprint outlined in the EIS was 182.8 ha of land, including 156.9 ha currently used for grazing purposes, 25.6 ha used for cropping and 0.3 ha for other uses.

The revisions to the infrastructure corridor alignment and intersections is estimated to have an overall reduction in the area of disturbance of -0.0787 ha (-0.125 from the corridor realignment, offsetting a 0.046 increase from the intersection amendments). However, it is noted that the areas impacted by the amendments are not used for agricultural purposes, with these areas primarily being mature, shrubby woodlands.

As such, no material change is anticipated in the findings in this section.

SECTION 5.3 – IMPACTS TO GOVERNMENT

5.3.1 – CONTRIBUTION TO GOVERNMENT REVENUES

No material change.

With no change to the outcomes of Section 5.1 (Contribution to the Economy), which is what drives the outcomes of this section, the findings presented in section 5.3.1 are anticipated to remain appropriate.

5.3.2 – IMPACTS ON LOCAL INFRASTRUCTURE AND SERVICE PROVISION

No material change.

While the proposed amendments will slightly alter the infrastructure proposed to be provided, there will be no material change in demands on infrastructure/ services and the proposed amendments will have no implications on the analysis presented in this section.

SECTION 5.4 – IMPACTS ON THE LOCAL PROPERTY MARKET

Negligible impact.

The change to construction hours may result in some periods of a minor increase in greater demand for non-local workers and thereby have some minor implications on demand for short term accommodation in the nearby areas during these periods. However, overall the change in construction hours is anticipated to result primarily in spreading the working requirements across the additional work hours with minimal impact on the number of workers required. As outlined in section 5.4 of the economic impact assessment, the construction period is relatively short (approximately 12-months) and is not anticipated to result in high levels of demand for non-local workers. The change to construction hours is not anticipated to materially change the overall full time equivalent (FTE) construction workforce requirements and the impact on demand for short stay accommodation is likely to remain small, with negligible difference from the original assessment.

SECTION 5.5 – OTHER IMPACTS

5.5.1 – COST OF GREENHOUSE GAS EMISSIONS

No material change.

The proposed amendments are not anticipated to result in any change in the overall levels of construction activity or traffic movements, and are thereby not anticipated to result in any material change to that outlined in section 5.5.1 of the economic impact assessment.

5.5.2 – COST OF TRAFFIC GENERATION

Minor reduction.

The proposed amendments are not anticipated to result in any changes to the amount of traffic generated or overall transport task, and is thereby not anticipated to result in any changes to the costs examined in section 5.5.2 of the economic impact assessment. However, the following is noted:

- While the overall transport task is not expected to be materially impacted, the proposed amendment to construction hours can be expected to result in some changes to when the traffic is generated. Extended construction hours will not coincide with peak traffic periods, ensuring continued efficient operation of the surrounding road network. The extended construction hours would allow works to be undertaken during low traffic periods, reducing any traffic impacts of the Project.
- A key rationale for the amendment to the Mitchell Highway intersections is to improve safety of this intersection, and thereby reduce the risk of road incidents. As such, there may be expected to be a small decrease in the assessed cost of crashes. However, information regarding the potential reduction in crash risk and severity is not available (and implications on reducing the assessed cost of crashes likely to be minor, although positive in nature).

5.5.3 – ECOSYSTEM SERVICE IMPACTS

Minor increase.

The revisions to the infrastructure corridor alignment and intersections is estimated to result in some changes to the area of native vegetation directly disturbed by the proposed development (increasing from 97.24 ha to 97.53 ha) and thereby the plant communities and species that may be impacted.

The revised *Biodiversity Development Assessment Report*[1] outlines the following ecosystem credits (Table 1) and species credits (Table 2) that will be required to offset the proposed development to achieve the 'no net loss standard' as established by the Biodiversity Assessment Method (BAM), as well as the estimated cost of offsets based on latest credit prices from the Biodiversity Credits Market Sales Dashboard[2].

Table 1. Plant Community Type (PCT) Offset Credit Requirements

Plant Community Type (PCT)	Credits Required	Credit Price	Total Offset Price
PCT 103 Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion	273	$2,782	$759,486
PCT 105 Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion	2	$2,600	$5,200
Total ecosystem credits required	**275**	**-**	**$764,686**

Source: Ecoplanning, 2025.

[1] Ecoplanning (2025). *Biodiversity Development Assessment Report*. Report prepared by Ecoplanning for Aeris Resources Ltd.
[2] DEH (2025). *Biodiversity Credits Market Sales Dashboard*. NSW Government Department of Environment and Heritage. https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity-offsets-scheme/biodiversity-credits-market/estimating-credit-prices/biodiversity-credits-market-sales-dashboard. Accessed: 28/07/2025.

Table 2. Species Credit Requirements

Species	Credits Required	Credit Price	Total Offset Price
Ninox connivens (Barking Owl)	244	$825	$201,300
Tyto novaehollandiae (Masked Owl)	3	$1,800	$5,400
Total species credits required	**247**	**-**	**$206,700**

Source: Ecoplanning, 2025.

In total, the cost of offsets is indicatively estimated to be around $971,386. This is an approximate increase of around $120,000 in the cost of credits required relative to what is outlined in section 5.5.3 of the economic impact assessment, which is considered minor relative to the overall Project value.

5.6 – CUMULATIVE ECONOMIC IMPACTS

Negligible impact.

The cumulative impact section (section 5.6) of AEC's economic impact assessment examined the cumulative impacts of the Project on the following key areas:

- Impacts on the Labour Market.
- Impacts on Housing Affordability.
- Impacts on Infrastructure and Service Provision.

As outlined in the responses above, the proposed Project amendments may result in some minor implications on the timing of demand for construction workers, and may result in some minor (short term) increases in non-local worker demand (and short term accommodation). This may be exacerbated by competition with other projects. However, from a cumulative impact perspective, it should also be noted that amending to 24 hour construction will also allow for more flexibility in timing of labour demands while also spreading this demand across the additional work hours, which may support a dampening of cumulative demands on labour. Overall, the amendments are not anticipated to result in any change in demand for local infrastructure and services, and thereby result in no change in implications on local infrastructure and service demand presented in the section 5.6.

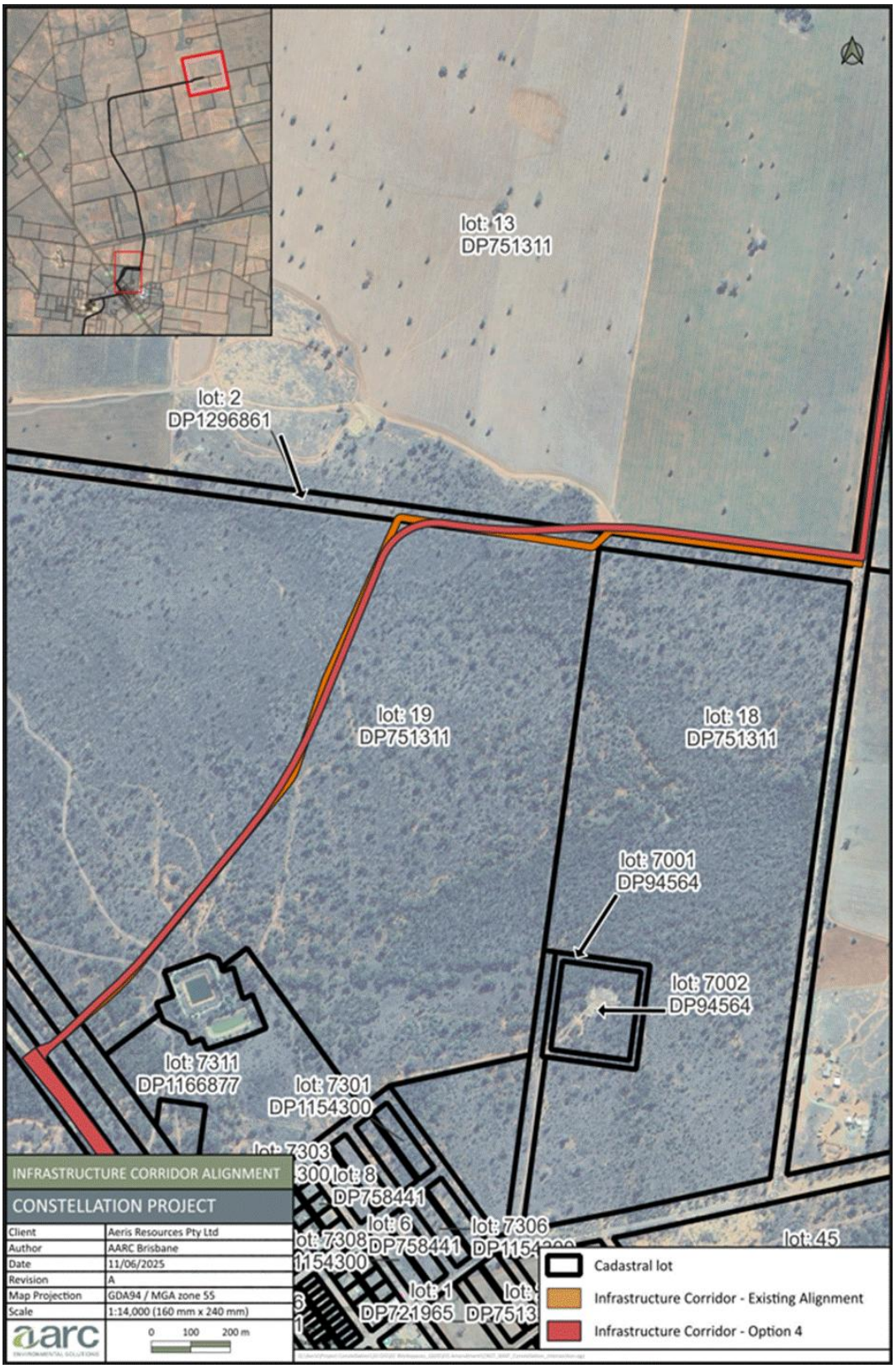
ENCLOSURE B: INFRASTRUCTURE CORRIDOR REALIGNMENTS

The following figures present the proposed infrastructure corridor realignments.

Figure 1. Amendment 1 – Avoiding Lot 10 DP48604



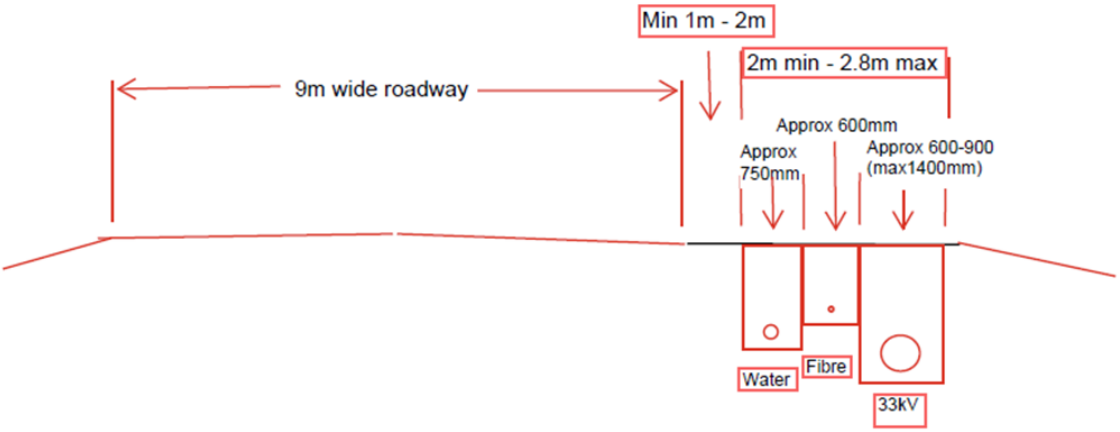
Figure 2. Amendment 2 – Infrastructure Realignment on Lot 13 DP751311, Lot 2 DP1296861 and Lot 19 DP751311



ENCLOSURE C: UNDERGROUND POWERLINE

The following figure outlines the proposed inclusion of an underground powerline within the existing EIS proposed corridor.

Figure 3. Inclusion of Underground Powerline Within Existing EIS Proposed Infrastructure Corridor



ENCLOSURE D: INTERSECTION FOOTPRINT

The following figures outline the proposed amendments to the Mitchell Highway intersection footprint.

Figure 4. Link to Eastern Side of Mitchell Highway

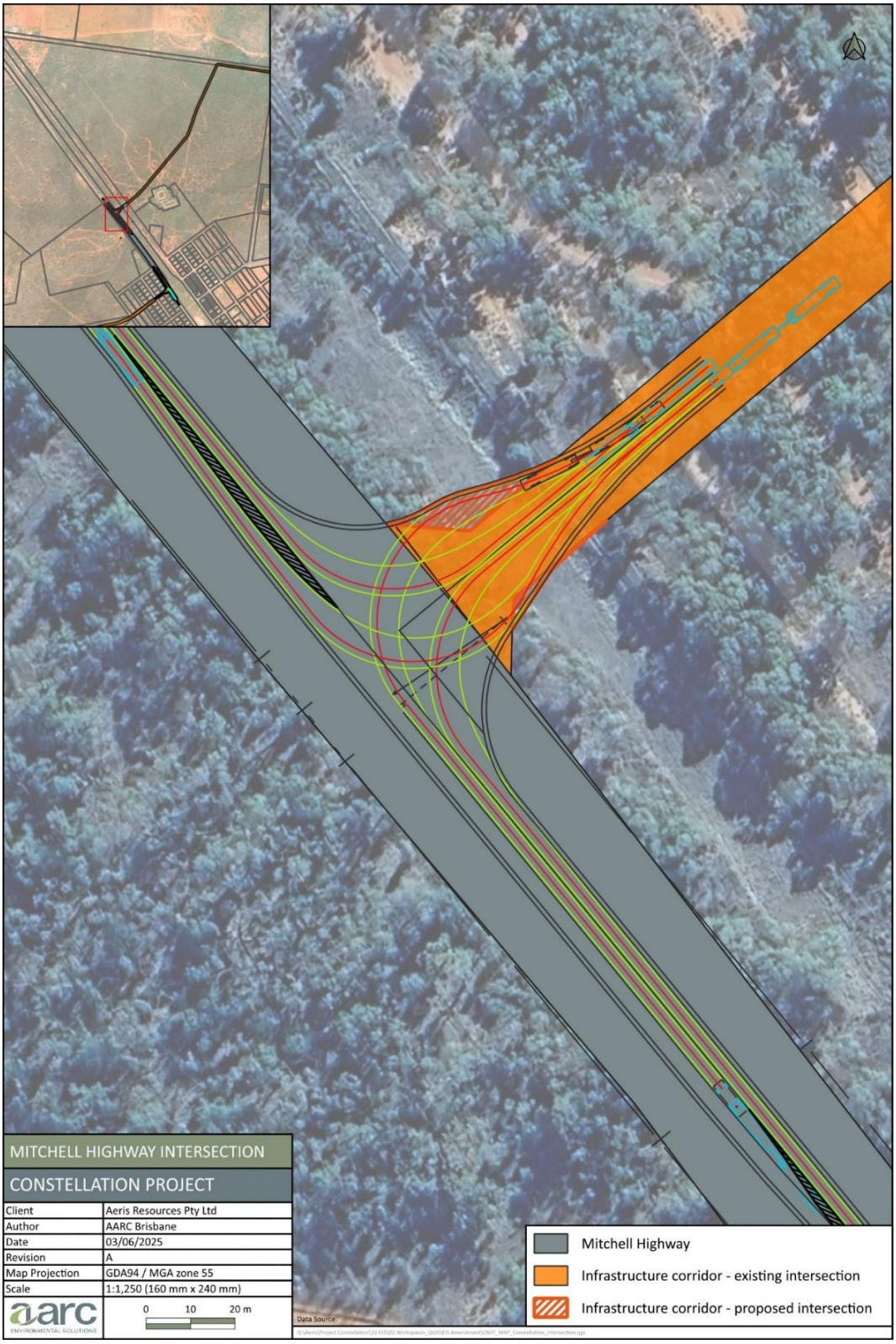
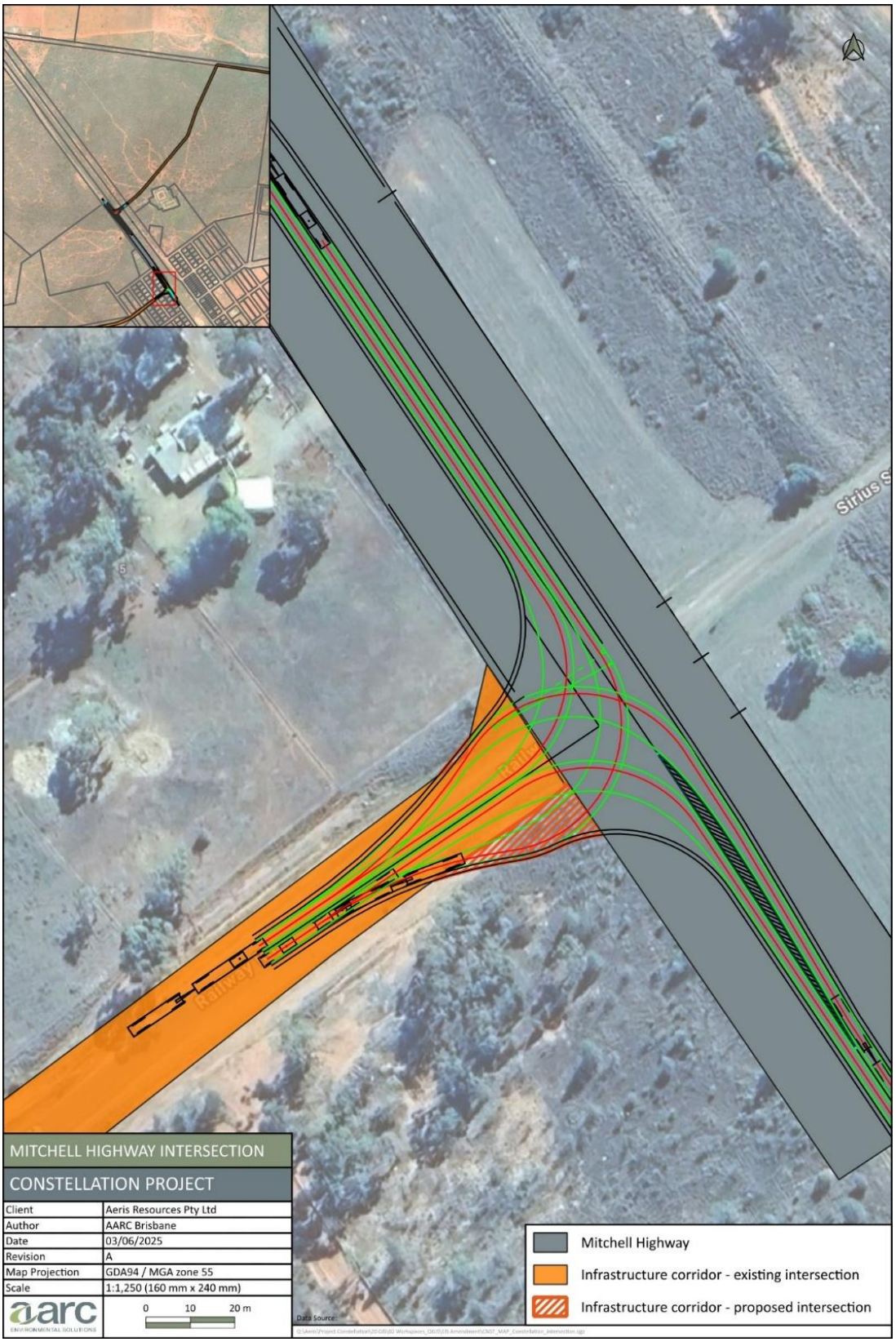


Figure 5. Intersection of Mitchell Highway with Railway Road



Stantec Australia Pty Ltd
L9, The Forum, 203 Pacific Highway, St Leonards NSW 2065
ABN 17 007 820 322 www.stantec.com/au

3 July 2025

Enquiries: Brett Maynard
Project No: 300303866

AARC Environmental Solutions Pty Ltd
164 Wharf Street
SPRING HILL QLD 4000

Attention: Helen Wood (Principal)

Dear Helen

RE: Constellation Project TIA Addendum
Transport Impact Assessment Addendum

1. Introduction

A State Significant Development Application (SSD- 41579871) was submitted for the proposed development of an open cut and underground mining operation (the Constellation Project). The Project is proposed as a satellite site of Tritton Copper Operations (owned and operated by Aeris). Tritton Copper Operations operates as a hub and spoke model with Tritton Copper Mine serving as the hub (where the processing facility is located) and other surrounding deposits supplying ore for processing.

The SSDA was submitted to the department in July 2024, accompanied by an Environmental Impact Statement (EIS). The EIS was publicly exhibited between 15 August 2024 and 11 September 2024. Stantec prepared a response letter dated 27 November 2024 to address the traffic and transport related matters.

As an outcome of the engineering design refinements and stakeholder engagement, Aeris is now seeking to make minor amendments to the proposed works. The amendments include revised construction operation hours and minor corridor realignments.

The following addendum letter addresses the proposed amendments from a traffic and transport perspective and should be read in conjunction with the *Constellation Project*, *Transport Impact Assessment (TIA)* prepared by Stantec dated 18 April 2024.

2. Amendments to Proposal

2.1 Overview of amendments

Aeris is seeking to amend the Project Description and the EIS, to change four aspects of the project. These amendments include the following key changes:

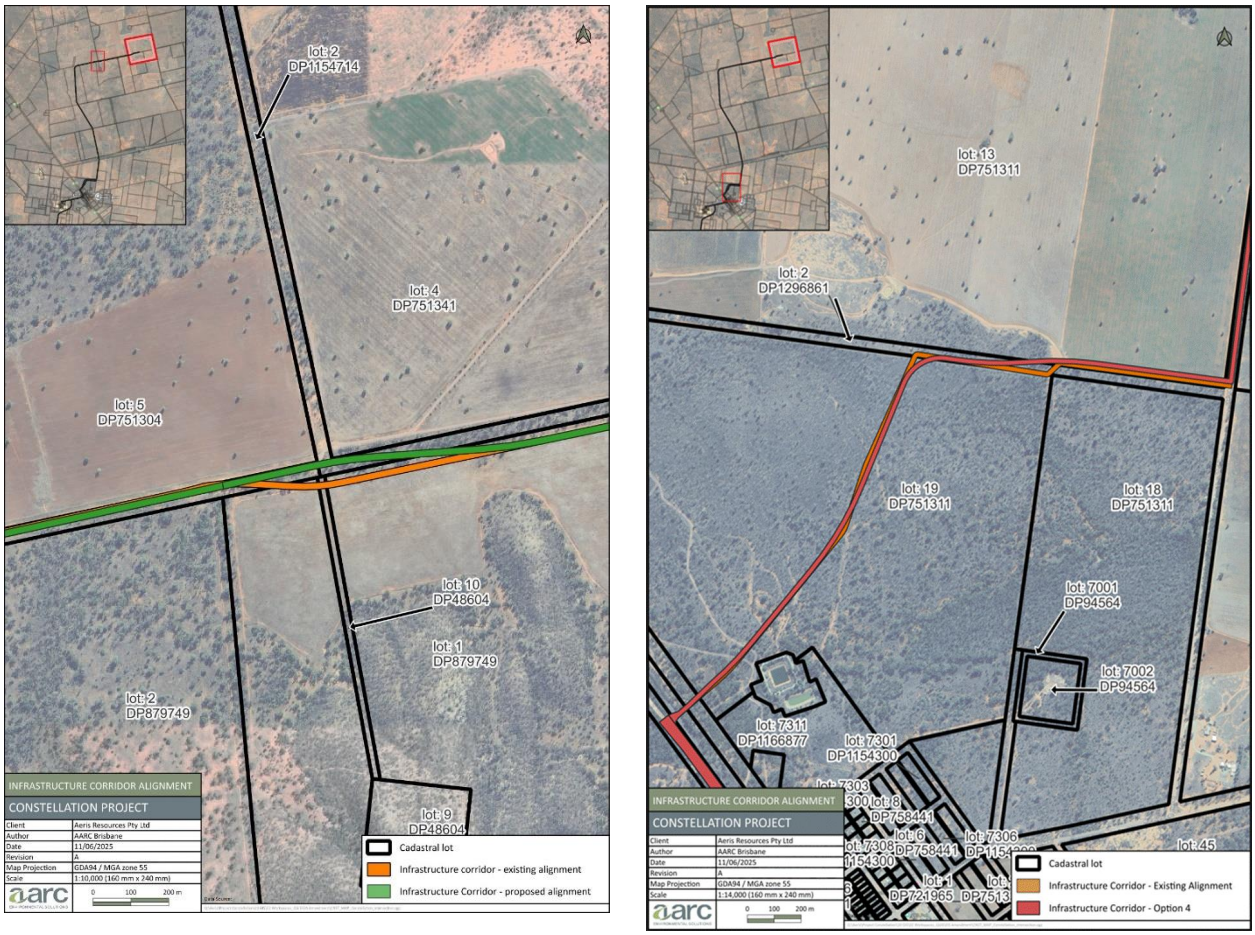
- **Amendment 1:** Realignment of the infrastructure corridor around the crown land lot 10DP48604 to accommodate road-registered trucks, sized up to AB triples with 70 t payloads.
- **Amendment 2:** Realignment of the infrastructure corridor associated with Lot 13 DP751311, Lot 19 DP751311, and Lot 2 DP1296861, to improve road curvature and accommodate registered trucks sized up to AB triples re-alignments with 70t payloads.
- **Amendment 3:** Inclusion of an underground powerline within the existing 18-metre-wide infrastructure corridor, and minor modifications to the Mitchell Highway intersections to improve truck turning movements.
- **Amendment 4:** Revision of construction operation hours to 24 hours per day, seven days a week.

2.2 Amendment 1 & 2: Realignment of Corridors

As part of the amendments, the infrastructure corridor has been slightly realigned around Crown Land Lot 10 DP48604 and through several adjoining lots to better accommodate AB triple trucks with 70-tonne payloads. These adjustments are minimal and do not significantly alter the original alignment. The realigned corridors are shown below in Figure 1.

As shown Figure 1, the revised alignment does not affect the public road network, and maintains the safety and functionality of the previously proposed alignment, with no anticipated adverse impacts on traffic operations or road safety.

Figure 1: Amendment 1 & 2– Realigned Corridor



2.3 Amendment 3: Minor Change in Footprint of Mitchell Highway Intersection

The third amendment proposed includes the inclusion of underground powerline in existing 18m infrastructure corridor. In addition to the above, the proposed infrastructure corridor included a new T-intersection connecting to the eastern side of the Mitchell Highway (north of Girilambone) and an upgrade to the intersection of the Mitchell Highway with Railway Road (west of Girilambone).

As detailed in the Constellation Project TIA (Stantec, 2024), the intersections have been designed to include a channelised right-turn lane treatment. The design of the intersections has also been further refined to incorporate improved road curvature, and enable safe and efficient movement of AB triple trucks with payloads of up to 70 tonnes, travelling at speeds between 20 and 30km/h.

The new design appropriately addresses road safety by:

- Allowing vehicles to navigate turns safely at appropriate speeds
- Providing sufficient stopping sight distance
- Reducing the likelihood of off-path and head-on crashes.

The proposed modified intersections on Mitchell Highway are shown in Figure 2 and Figure 3.

Considering there are no major changes to the proposed intersections on Mitchell Highway the amendments are considered appropriate and maintains its suitability for its intended use. Further, the changes do not alter the Constellation Project TIA (Stantec, 2024) outcomes.

Figure 2: Amendment 3 – Link to eastern side of Mitchell Highway

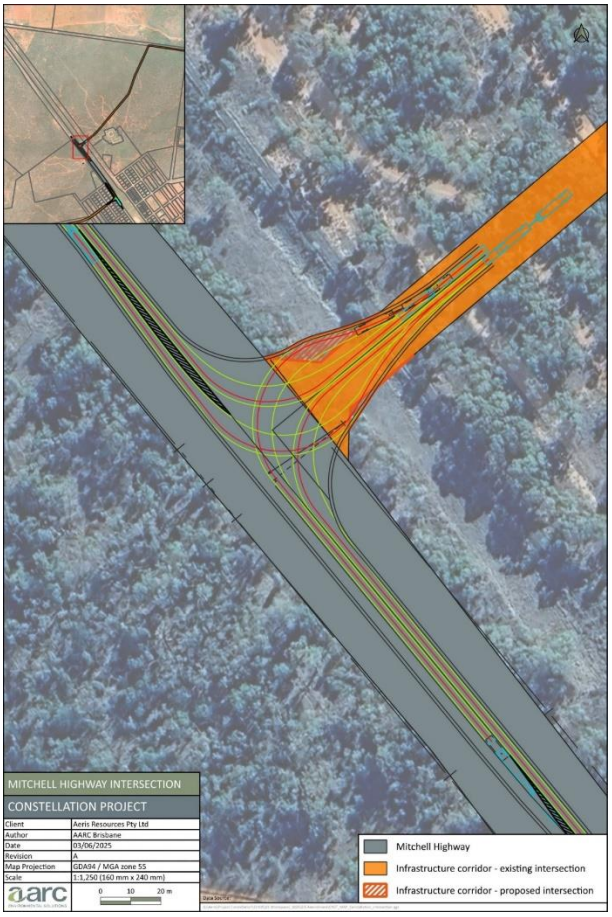
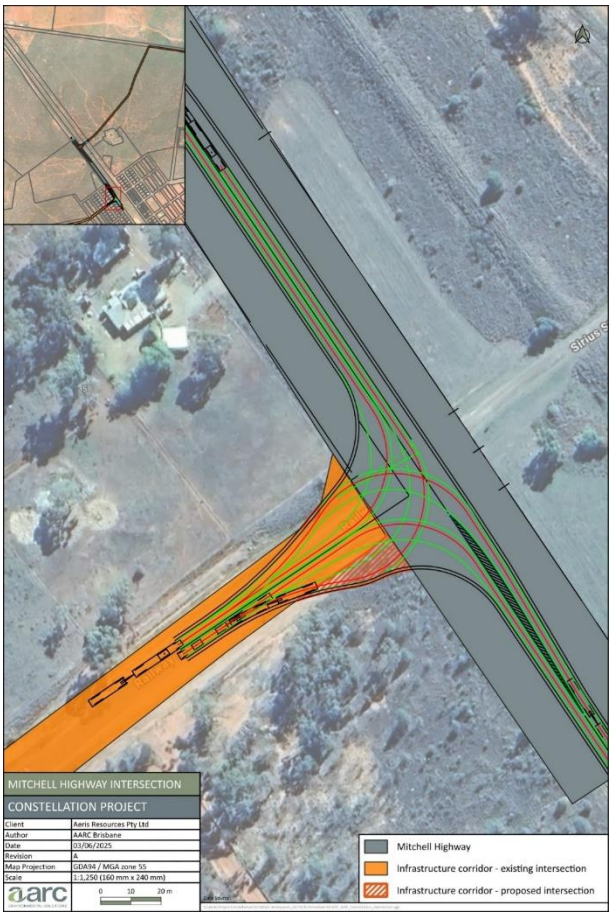


Figure 3: Amendment 3 – Intersection of Mitchell Highway with Railway Road



2.4 Amendment 4: Construction Operation Hours

Construction hours have been revised to allow 24-hour operations, seven days a week. While haulage activities were already proposed to operate continuously, construction activities were previously limited to 6:00 am–10:00 pm.

The activities to be undertaken during the construction stage of the development includes construction of the following:

- the mine site, including site preparation, clear and grade and earthworks for all pads, including the mining infrastructure area and surface infrastructure (EIS Chapter 3, Section 3.9.1.1)
- the 2,850 m section of the new road for site access to bypass Girilambone town and upgrading existing roads in the infrastructure corridor (EIS Chapter 3, Section 3.9.1.2)
- the underground water supply pipeline between the Project mine site and the Murrawombie Copper Mine in the infrastructure corridor (EIS Chapter 3, 3.9.1.2)
- water management infrastructure, including clean water diversions, dirty water diversions and water storage facilities and pipelines (EIS Chapter 3, Section 3.8.4)
- buildings and installing the heap leach facilities, paste plant, stockpile area and the other site facilities, such as offices and emergency facilities, laydowns, solar farm and power station, explosives storage area identified in EIS Chapter 3, Section 3.7
- the box cut and portal to enable underground access development, then the decline and underground workings, the underground ventilation system and underground mining infrastructure (EIS Chapter 3, Section 3.6).

Aeris propose to amend those hours to 24 hours per day, seven days a week.

It is not anticipated that the extended construction hours would alter predicted construction delivery vehicle frequency or construction peak hour traffic movements, as outlined in Section 4.2 of the Constellation Project TIA (Stantec, 2024). The extended construction hours would allow works to be undertaken during low traffic periods, reducing any traffic impacts of the Project.

3. Parking Impacts

It is not expected that the proposed amendments will generate an increased demand for parking. As such the proposed parking arrangements described in the Constellation Project TIA (Stantec, 2024) remain unchanged.

4. Traffic Impacts

The amendments are not anticipated to generate additional traffic impacts beyond those assessed in the Constellation Project TIA (Stantec, 2024). Extended construction hours will not coincide with peak traffic periods, ensuring continued efficient operation of the surrounding road network. The extended construction hours would allow works to be undertaken during low traffic periods, reducing any traffic impacts of the Project.

Given the minor nature of the changes, the proposal remains supportable from a traffic and transport perspective.

I trust this is satisfactory; should you have any questions, please do not hesitate to contact me directly.

Yours sincerely

Stantec Australia Pty Ltd



Brett Maynard
Market Leader – Transport Planning and Advisory

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3 July 2025

Gemma Brown

Aeris Resources Ltd

Level 6, 120 Edward St

Brisbane QLD 4000

By email: gbrown@aerisresources.com.au

Attention: Gemma Brown

Constellation Project: Visual Amenity

The Constellation Project (the Project) is a state significant development (SSD-41579871) being assessed under the Environmental Planning and Assessment Act 1979. Aeris submitted the development application to the department in July 2024, accompanied by an Environmental Impact Statement (EIS).

The EIS was publicly exhibited between 15 August 2024 and 11 September 2024 to seek opinions from the government agencies, local councils, and the community. On 12 September 2024, the Department of Planning, Housing and Infrastructure (DPHI) requested Aeris to submit a written response to the matters raised by NSW government agencies, Bogan Shire Council, and the community during the public exhibition of the EIS.

The Response to Submissions Report was submitted to address the matters raised from the 12 submissions received on 13 May 2025. DPHI invited comments on the RtS Report, from those that made submissions, via the NSW Major Projects Planning Portal.

As an outcome of engineering design refinements and stakeholder engagement, Aeris seek to amend the Project description and the EIS, to change three aspects of the Project. The relevant amendments to the visual amenity report seek to:

- Amendment 1 - realign the infrastructure corridor around the crown land lot 10DP48604 (Figure 1);
    - realignments have been designed to accommodate road-registered trucks, sized up to AB triples with 70 t payloads.
- Amendment 2 - realign the infrastructure corridor associated with Lot 13 DP751311, Lot 19 DP751311, and Lot 2 DP1296861 (Figure 2);
    - To redesign road curves; and
    - Accommodate road registered trucks sized up to AB triples realignments with 70 t payloads.
- Amendment 3 - Inclusion of underground powerline in existing proposed 18 m infrastructure corridor.
    - The amendment is associated within the existing infrastructure corridor that was proposed to be constructed from Murrawombie to the Constellation mine site.
    - The proposed underground powerline would be located within the proposed disturbance (18 m wide) in the EIS.
- Amendment 4 - revising the construction operation hours to 24 hours per day, seven days a week.

- A minor change in the footprint of the Mitchell Highway intersections for truck turning area is also proposed.
    - The original proposed infrastructure corridor from the project site to the Tritton Copper Mine, included a new T intersection to link the proposed infrastructure corridor with the eastern side of the Mitchell Highway (north of Girilambone) and an upgrade to the intersection of the Mitchell Highway with Railway Road (west of Girilambone).
    - The proposed modifications represent an insignificant increase in disturbance area of around **0.02** ha per intersection (**0.04 tota**l). Figure 3 shows the proposed modification to the new T intersection to link the corridor with the eastern side of the Mitchell Highway, and Figure 4 shows the proposed modification to the intersection of the Mitchell Highway with Railway Road.

This letter aims to provide an update to the previous Visual Impact Assessment prepared by AARC (the original report) and assess the change in visual impacts that may arise from the amendments outlined above. The letter limits the assessment of impacts to consider Amendment 1, Amendment 2 and the minor change in the footprint of the Mitchell Highwall intersections. This scope was identified on the basis that Amendments 3 and 4 will not result in any change to the original report. A map of the sensitive receptors assessed as part of the original report can be found in Figure 5.

Amendment 3 describes the inclusion of an underground pipeline, which will not be visible during operations and will only be observed during construction. The original report assesses the impacts of the construction of the haul route within the infrastructure corridor. As such, it is not expected that the magnitude of the impacts assessed will be altered by the inclusion of an underground pipeline.

Amendment 4 expands the construction operation hours to 24 hours per day, seven days a week. The original report assessed the maximum visual impact of the Project, which included the assessment of mining operations occurring 24 hours per day, seven days a week. The impacts associated with continuous operation have been assessed as part of the original report. It is not expected that the visual impacts assessed will be altered by the expansion of construction operation hours to 24 hours per week, seven days a week.

Landscape impacts of the amendments

The amended road design is not expected to result in any significant increase to vegetation clearing. All vegetation clearing remains within a primary production land zone, where roads are expressly permitted. As such, there is likely to be minimal change in the magnitude of the landscape impact. Therefore, the overall landscape impact of the amended haul route on the surrounding environment is expected to be minimal.

The amendment to the intersection design for the Mitchell Highwall is unlikely to result in any changes to the landscape impacts described in the original report. The intersection generally remains within the existing footprint of the Mitchell Highway and surrounding roads, with additional disturbance limited to areas already cleared of vegetation. The slight increase in total disturbance is unlikely to alter the landscape impacts described in the original report significantly.

The overall landscape impact of the proposed haul route on the surrounding environment is expected to be minimal, as most of the route is proposed to follow the same infrastructure corridor assessed in the original report. Where the infrastructure corridor diverges from the previous corridor, it does so in a primary production land use zone. It is expected that at closure, all impacts associated with the proposed haulage route will be negligible, given the absence of additional mining traffic and the land use zones impacted.

Visual impacts of the amendments

In assessing the visual impacts associated with the Project, the visual sensitivity and the magnitude of the visual effect must be considered for each sensitive receptor where the Zone of Theoretical Visibility (ZTV) intersects with the proposed development. The amendments to the infrastructure corridor will not result in any significant changes to the visual impacts for each receptor identified in the visual impact assessment previously prepared.

The sensitivity of a sensitive receptor is based on the following factors:

- receptors interest in the visual environment (high, medium or low interest in their everyday visual environment and the duration of the effect);
- receptors viewing opportunity (prolonged, regular viewing opportunities); and
- number of viewers and their distance/ angle of view from the source of the effect, extent of screening/ filtering of view.

Considering this, the proposed amendments will not result in any change to these factors for any of the identified sensitive receptors as the change in infrastructure configuration does not change the interest in the visual environment; it does not impact viewing opportunities; and does not change the distance/ angle of the view, such that any sensitive receptor is more sensitive to the impacts than as described in the original report.

The magnitude of the impact for each viewpoint was determined based on the form of the impact (i.e. scale, size and character) with respect to the proximity of each sensitive receptor. The magnitude of the impact associated with the proposed amendments has been assessed based on the planar area, considering the visual impacts hauling activities may pose to sensitive receptors. The proposed amendments impact the following receptors:

- R1
- R2
- R5
- R14
- R15
- R17
- R18
- R19
- R20
- R21
- R22
- R23
- R24
- R25
- R26
- R27
- R28
- R29

The changes associated with amendments 1 and 2, as shown in Figure 1 and Figure 2, will be theoretically observed by all sensitive receptors. However, for the areas where the amended infrastructure corridor diverges from the existing road network, vegetation and topographical screening mitigate visual impacts, resulting in negligible visual impact as a result of the amendment infrastructure corridor.

The modifications to the Mitchell Highway (new T intersection) will be within the ZTV of all of the receptors, excluding R1, R2, R12 and R29. It is expected that the magnitude of the modifications to the Mitchell Highway and existing haul route will be negligible for all identified receptors, given the current road infrastructure in place. Key land uses in these areas will not change as a result of the Project, given that both the Mitchell Highway and Railway Road are sealed roadways that currently support consistent traffic associated with both commercial and residential purposes. As such, it is reasonable to conclude that any visual impacts will be negligible given the current land use of the Mitchell Highway and Railway Road.

As such, the proposed amendments are expected to have a negligible effect on the visual impacts described in the original report.

Overall impacts of the amendments

Overall, the proposed amendments will not significantly alter the visual impacts described in the original report. Based on this, the overall visual impacts for all sensitive receptors are outlined in Table 1, which is consistent with the assessment provided in the original report.

Table 1: Overall visual impacts for sensitive receptors

Receiver ID	Project site impact sensitivity	Infrastructure corridor impact sensitivity	Overall impact sensitivity
R1	Negligible	High-moderate	High-moderate
R2	Moderate-low	Negligible	Moderate-low
R3	None	Negligible	Negligible
R5	None	Negligible	Negligible
R6	None	None	None
R7	Negligible	None	Negligible
R8	Negligible	None	Negligible
R9	None	Negligible	Negligible
R10	Negligible	Negligible	Negligible
R11	Negligible	None	Negligible
R12	None	Negligible	Negligible
R13	None	None	None
R14	None	Negligible	Negligible
R15	None	Negligible	Negligible
R16	None	None	None
R17	None	Negligible	Negligible
R18	None	Negligible	Negligible
R19	None	Negligible	Negligible
R20	None	Negligible	Negligible
R21	None	Negligible	Negligible
R22	None	Negligible	Negligible
R23	None	Negligible	Negligible
R24	None	Negligible	Negligible
R25	None	Negligible	Negligible
R26	None	Negligible	Negligible
R27	None	Negligible	Negligible
R28	None	Negligible	Negligible

Receiver ID	Project site impact sensitivity	Infrastructure corridor impact sensitivity	Overall impact sensitivity
R29	None	Negligible	Negligible
R30	Negligible	None	Negligible
R31	None	None	None
R32	Negligible	None	Negligible
R33	None	None	None
R34	Negligible	None	Negligible
R35	Negligible	None	Negligible

Yours sincerely

Liam Morgan
Senior Environmental Scientist

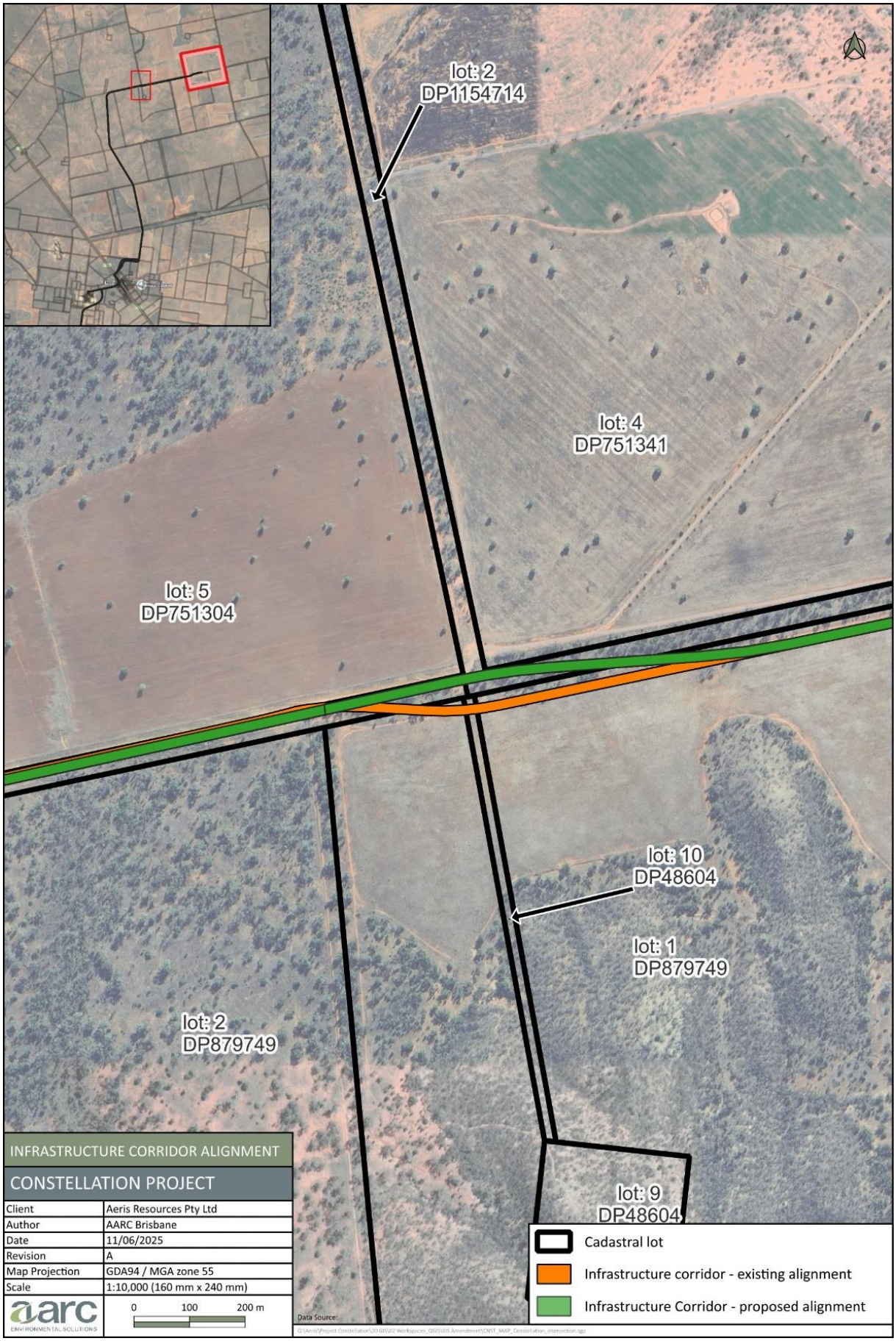


Figure 1: Amendment 1 - avoiding lot 10 DP48604

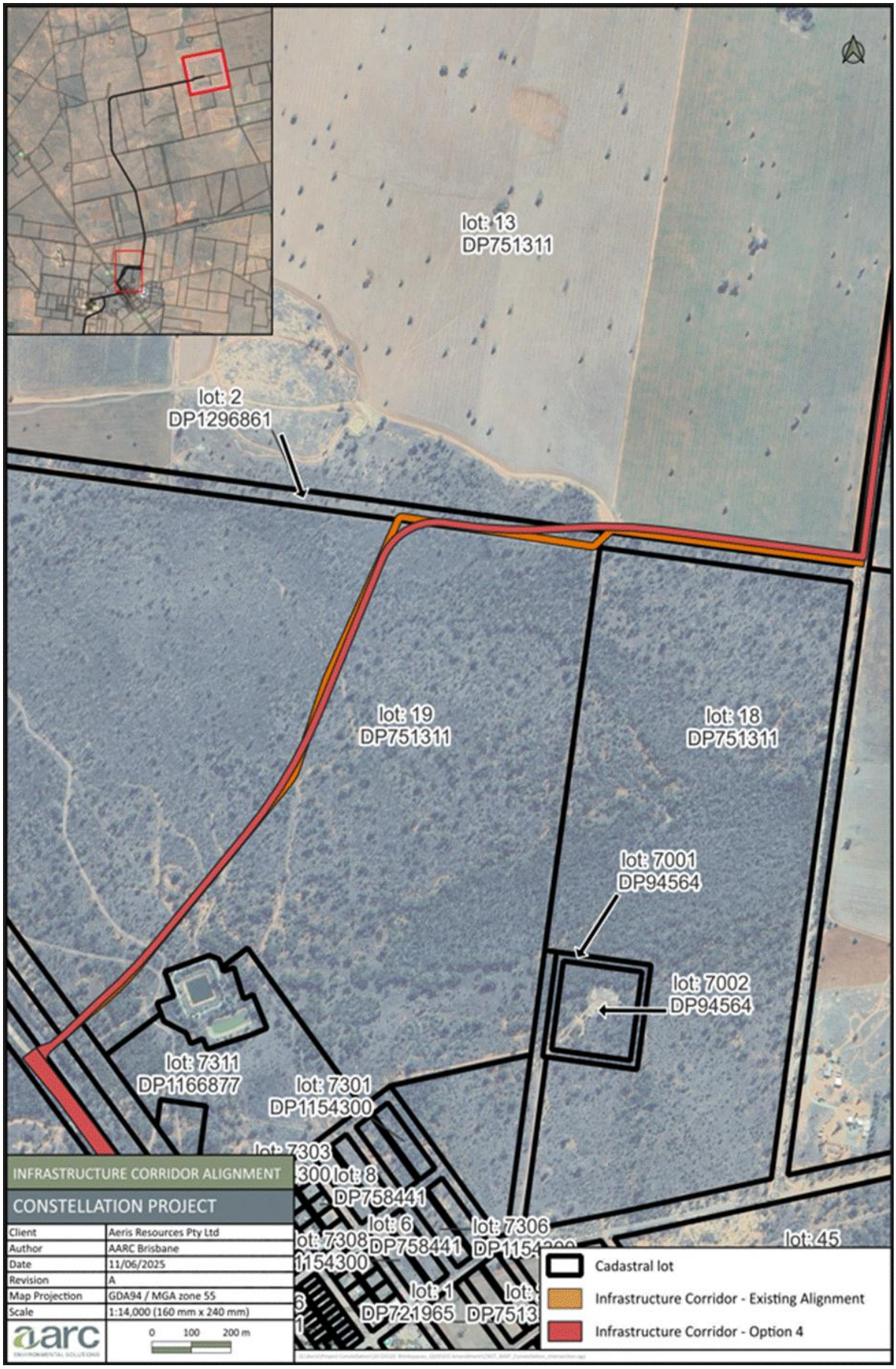


Figure 2: Amendment 2 - infrastructure realignment on lot 13 DP751311, lot 2 DP1296861, and lot 19 DP 751311

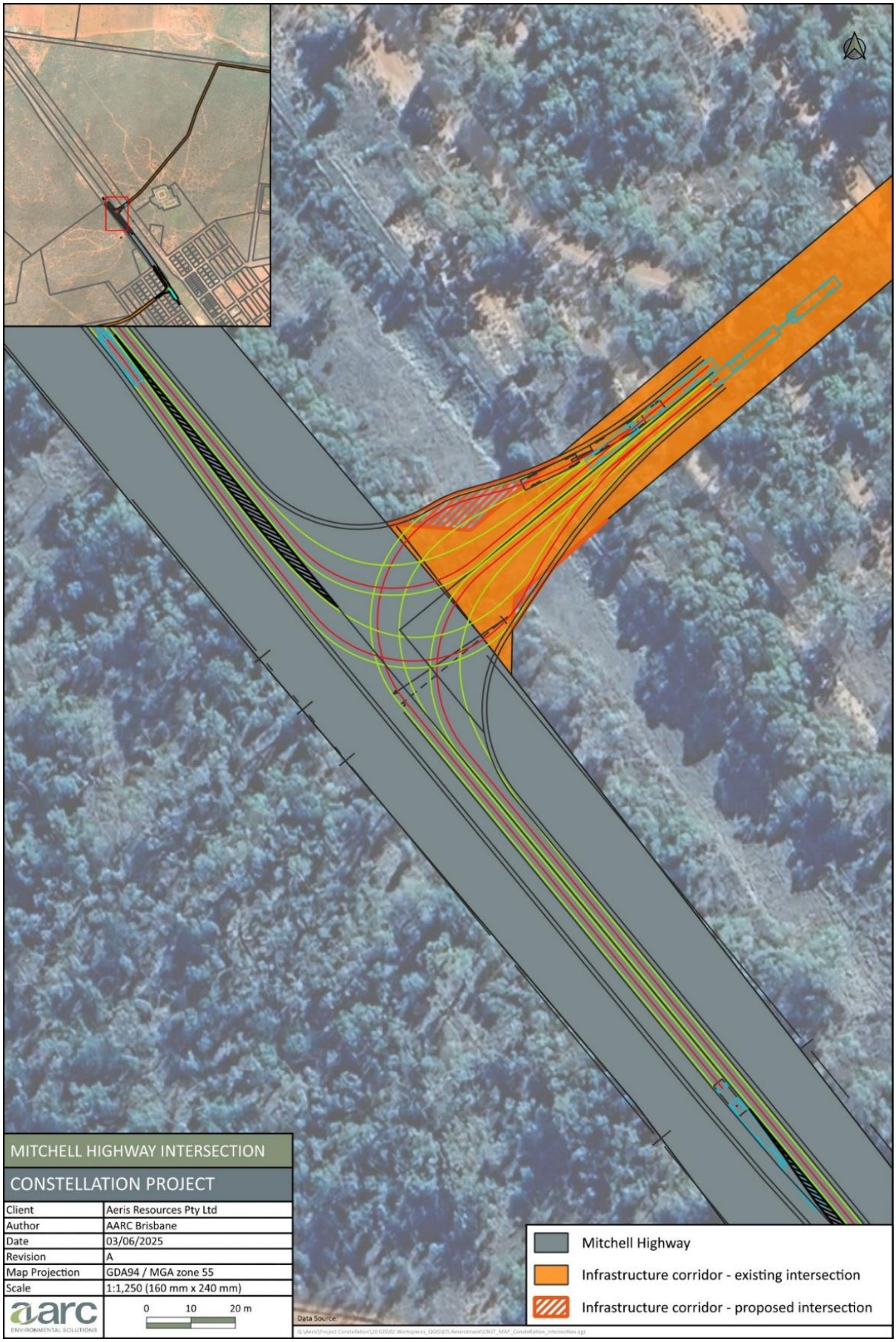


Figure 3: Link to eastern side of Mitchell highway

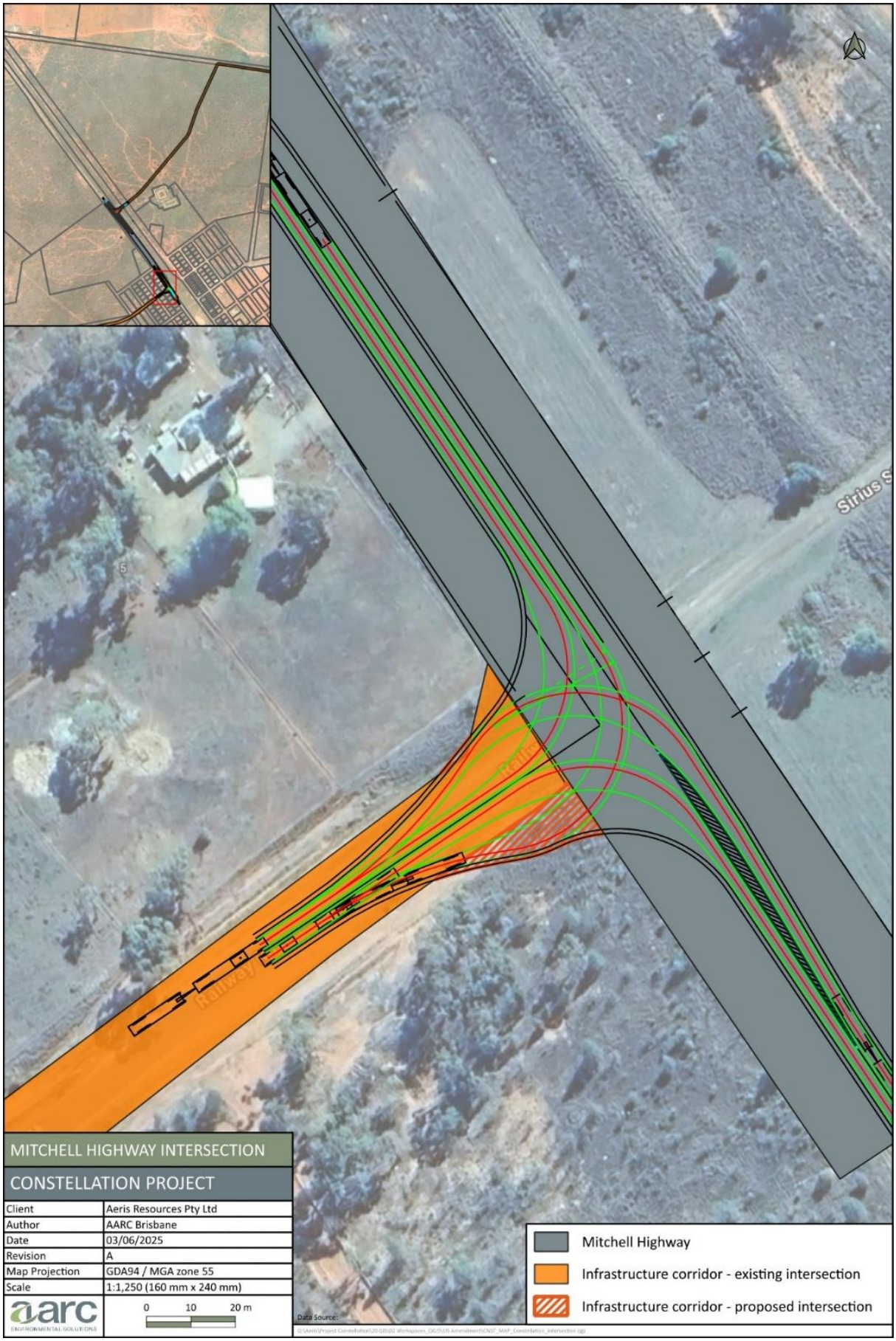


Figure 4: Intersection of Mitchell Highway with Railway Road

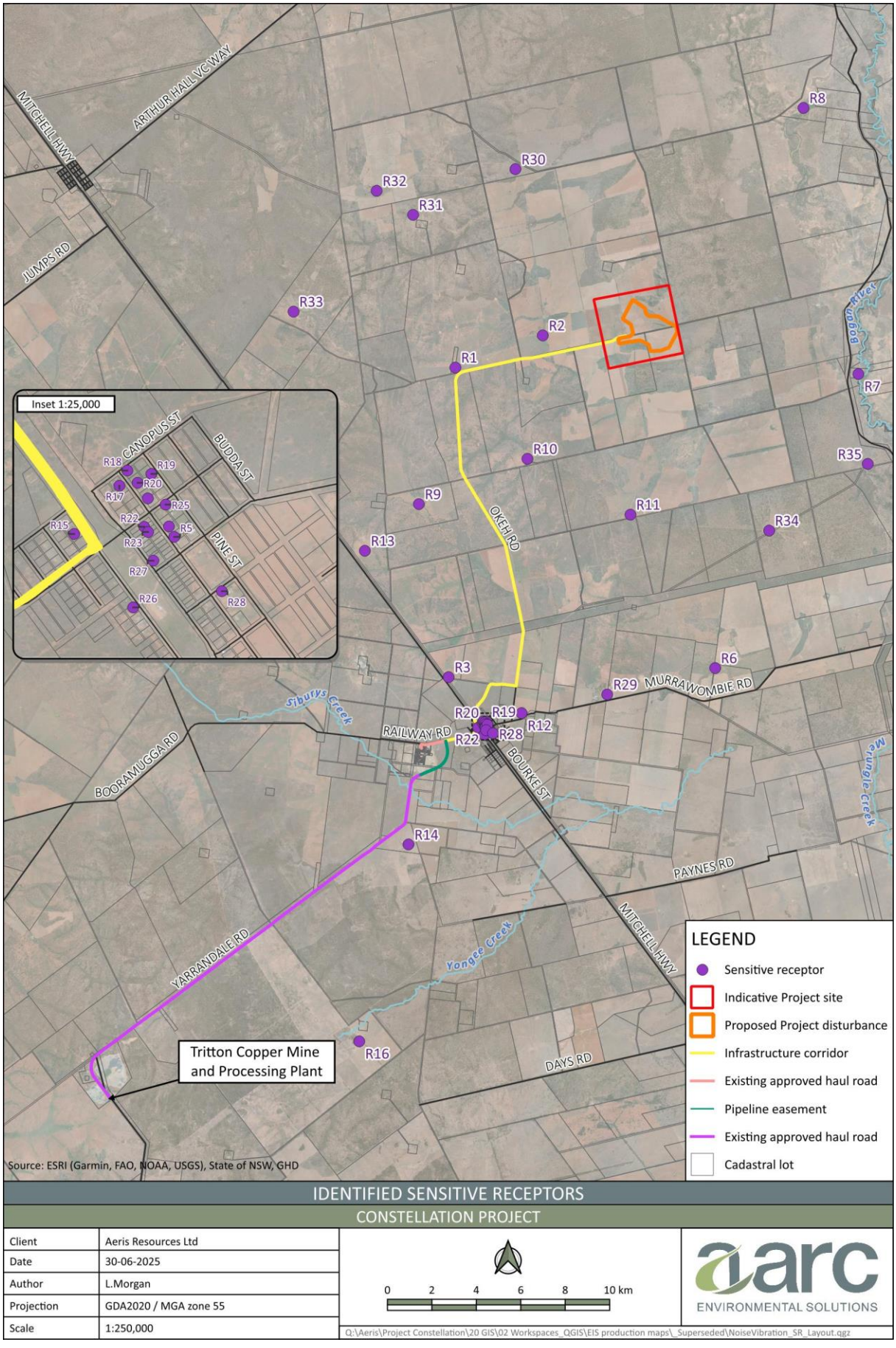


Figure 5: Sensitive receptor locations