Transgrid

People. Power. Possibilities.

HumeLink

Amendment Report

Rev 0

May 2024

Executive summary

Background

Transgrid proposes to increase the energy network capacity in southern New South Wales (NSW) through the development of new 500 kilovolt (kV) high-voltage transmission lines and associated infrastructure between Wagga Wagga, Bannaby and Maragle. The project is collectively referred to as HumeLink. The project traverses six Local Government Areas (LGAs) including Wagga Wagga City, Cootamundra-Gundagai Regional, Snowy Valleys, Yass Valley, Upper Lachlan Shire and Goulburn-Mulwaree, as shown on Figure ES-1.

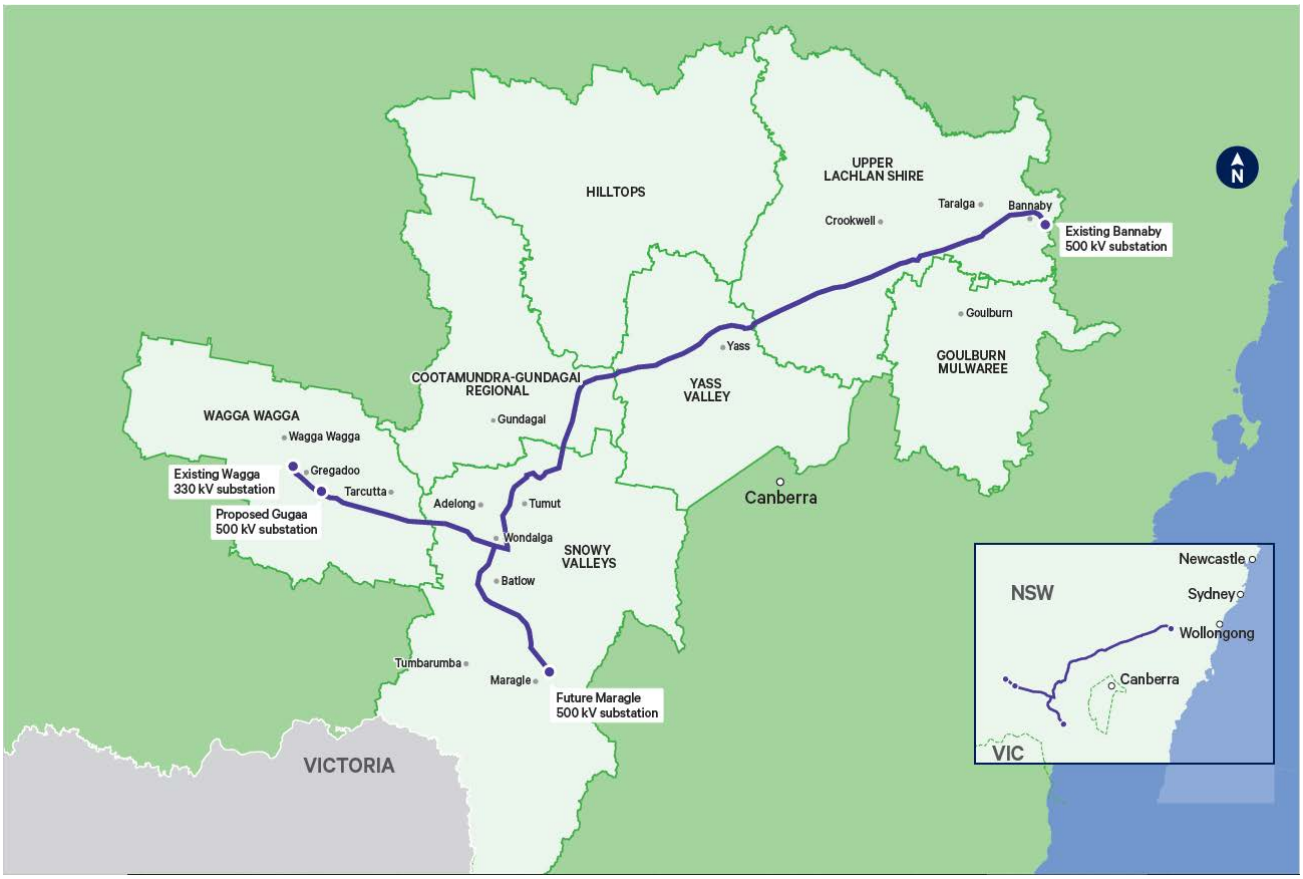


Figure ES-1 Overview of the amended project location

HumeLink is a priority project for the Australian Energy Market Operator (AEMO) and the Commonwealth and NSW governments and has been declared as Critical State Significant Infrastructure (CSSI). The project would deliver a cheaper, more reliable and more sustainable grid by increasing the amount of renewable energy that can be delivered across the national electricity grid, helping to transition Australia to a low carbon future.

An Environmental Impact Statement (EIS) was prepared to support Transgrid's application for approval of the project in accordance with Part 5, Division 5.2 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and was placed on public exhibition between 30 August 2023 and 10 October 2023.

Transgrid is proposing amendments and refinements to the project as described in the EIS. These amendments and refinements incorporate feedback received from stakeholders prior to and during the

public exhibition of the EIS and comments made in formal submissions on the EIS, and ongoing design and construction methodology development by the construction contractors.

This Amendment Report describes the proposed amendments and refinements to the project, assesses their environmental, social and economic impacts and recommends measures to avoid or minimise impacts. Transgrid has consulted broadly with stakeholders and the community on amendments and refinements in the Amendment Report.

What is the approvals process?

The project is CSSI and requires assessment and approval from the NSW Minister for Planning and Public Spaces under Part 5, Division 5.2 of the EP&A Act. The project has also been declared a "controlled action" under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and will be assessed by the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) under the assessment bilateral agreement, which accredits certain NSW processes to reduce assessment duplication by the Commonwealth government. As such, the project also requires approval from the Commonwealth Minister for Environment and Water.

The EIS prepared to support Transgrid's application for approval of the project was placed on exhibition by the Department of Planning, Housing and Infrastructure (DPHI) (formerly Department of Planning and Environment (DPE)) from Wednesday 30 August 2023 to Tuesday 10 October 2023.

During the public exhibition period, interested stakeholders and members of the community were able to review the EIS online or at display locations, participate in consultation and engagement activities, and make a written submission to DPHI for consideration in its assessment of the project.

A Submissions Report has since been prepared to respond to the submissions raised during the public exhibition of the EIS and will be submitted to the DPHI at the same time as this Amendment Report. This report should be read in conjunction with the Submissions Report.

In accordance with clause 179(2) of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation), an application may, with the approval of the Planning Secretary of DPHI, be amended at any time before the application is determined. Transgrid has prepared this Amendment Report in accordance with section 179(3) of the EP&A Regulation.

What amendments and refinements are proposed?

Amendments

A project amendment is defined as a change to what approval is being sought for. The proposed amendments to the project include:

- changes to the transmission line corridor including the realignment of the route through Green Hills State Forest to the west of Batlow
- change to the number and location of construction ancillary facilities, including worker accommodation facilities and construction compounds
- nomination of access tracks to support the construction and operation of the project
- additional telecommunications connections to existing substations.

Table ES-1 summarises the proposed amendments and their justification.

Table ES-1 Summary of proposed amendments to the project

Description	Justification
Changes to the transmission line corridor	
Green Hills corridor amendment The amended project includes the preferred western route through Green Hills State Forest. The new 32.5 km route extends from Wondalga through the Green Hills State Forest before travelling to the west and south of Batlow and connecting to the EIS project transmission line corridor in Bago State Forest. Minor transmission line corridor changes The following minor changes have been made to the transmission line corridor following design considerations and feedback from landowners: • 1.4 km realignment of the corridor to the north between Ashfords Road to Ivydale Road, Gregadoo • 2.5 km realignment of the corridor to the south across Kyeamba Creek and Tumbarumba Road, Book Book • 2.7 km realignment of the corridor to the east near Snowy Mountains Highway, Gadara • 1.4 km realignment of the corridor to the east adjacent Minjary National Park at Gocup • 5.9 km realignment of the corridor from north of the crossing of Tumut River to south of the crossing of Killimicat Creek, Killimicat (including a minor 50 m shift to the north for 2.1 km and a 2.6 km shift to the south from Brungle Road to before the crossing of Killimicat Creek) • 0.4 km realignment of the corridor to the north at Bannister, about 2.7 km west of Crookwell Road/Goulburn Road • narrowing of the project footprint at Wondalga, Gobarralong and Bowning.	In 2023, members of the community proposed an alternative alignment for the transmission line corridor between Wondalga and the future Maragle 500 kV substation through the Green Hills State Forest. Following engagement with Forestry Corporation of NSW (FCNSW), affected landowners and further technical analysis and investigations, the alternate transmission line corridor option west of Batlow and through Green Hills State Forest (referred to as the Green Hills corridor amendment) was identified as the preferred option for the transmission line corridor between Wondalga and the future Maragle 500 kV substation. In addition, nine minor changes to the transmission line corridor are proposed in response to further engagement with easement affected landowners, additional surveys and environmental assessments, and design development since public exhibition of the EIS.
Updates to construction ancillary facilities including worker accommodation facilities and construction compounds	
Changes to construction compounds The following compounds described and assessed in the EIS have been removed from the project: • Snowy Mountains Highway compound (C02) • Snubba Road compound (C03) • Red Hill Road compound (C08) • Adjungbilly Road compound (C09) • Woodhouselee Road compound (C11) • Bowmans Lane compound (C15) • Snubba Road compound (C16). These have been replaced with the following compounds: • Ardrossan Headquarters Road compound (C17) – located about 7.6 km west of Batlow • Snubba Road compound (C18) – located about 7.7 km south of Batlow • Gadara Road compound (C19) – located about 4.9 km west of Tumut	Updates to construction ancillary facilities including worker accommodation facilities and construction compounds are proposed following further construction planning and consultation with affected landowners. It was determined that Tumbarumba accommodation facility (AC1) location was not suitable to facilitate the construction program, mainly due to its distance to other parts of the project footprint and is no longer required. In responding to stakeholder and community feedback on the likely shortage in existing available accommodation for workers in nearby towns and further construction planning, five new worker accommodation facilities are proposed in Tarcutta, Adjungbilly, Yass, Crookwell and Green Hills.

Description	Justification
• Ellerslie Road compound (C21) – located about 13.1 km south-west of Adelong. The proposed footprint for the Gregadoo Road compound (C06), Honeysuckle Road compound (C07), Bannaby substation compound (C12) and Memorial Avenue compound (C14) have also been revised. Following these changes, 11 standalone construction compounds are proposed. Changes to temporary worker accommodation facilities The Tumbarumba accommodation facility (AC01) is no longer required. The amended project includes the following new combined worker accommodation facilities and compounds (which are in addition to the 11 standalone compounds listed above): • Tarcutta accommodation facility and compound (AC03) – located about 1.5 km south-west of Tarcutta • Adjungbilly accommodation facility and compound (AC04) – located about 21.7 km east of Gundagai • Yass accommodation facility and compound (AC05) – located on the north-western outskirts of the Yass township • Crookwell accommodation facility and compound (AC06) – located off Graywood Siding Road, about 18.1 km north of Goulburn • Green Hills accommodation facility and compound (AC07) – located about 6.5 km west of Batlow.	
Nomination of access tracks	
New access tracks or upgrades to existing access tracks are proposed to connect construction areas and the transmission line easement to the existing road network. Existing unsealed local roads, forest roads, and tracks proposed for use as part of the access arrangements may also require minor improvement work, such as grading or resurfacing, or drainage work.	Following further construction planning, feedback from NSW Department of Climate Change, Energy, the Environment and Water – Environment and Heritage (NSW DCCEEW – Environment and Heritage) and consultation with affected landowners, additional access tracks have been nominated to include the full extent of access tracks between the transmission line corridor and the existing road network. This increase is to accommodate, provision of safe access/egress while minimising the environmental impacts of the project where possible by prioritising the use and upgrade of existing access tracks over the creation of new access tracks, where possible.
Additional telecommunications connections to existing substations	
Removal of the telecommunications hut at Killimicat from the scope and inclusion of additional telecommunications connections to the following Transgrid substations: • Gadara 132 kV substation • Gullen Range 330 kV substation • Crookwell 2 330 kV substation.	Following further design development, three telecommunications connections to existing Transgrid substations were identified in addition to the telecommunications connection to the existing Rye Park 330 kV Switching Station proposed in the EIS. These additional telecommunications connections remove the need for the telecommunications hut at Killimicat and associated potential property impacts.

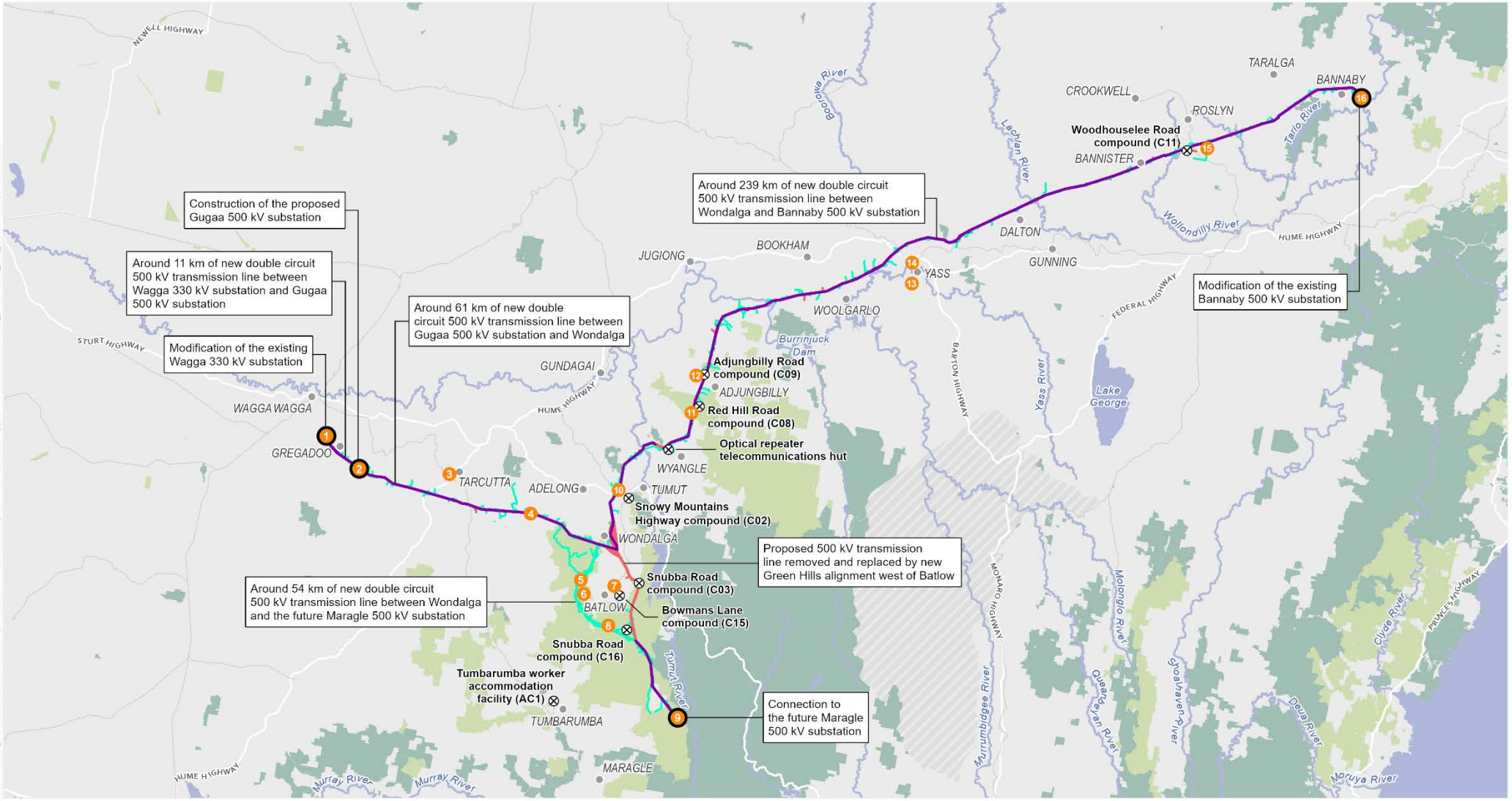
Refinements

Refinements to the project are aspects of the project that generally fit within the limits set by the project description in the EIS. Refinements do not change what is being sought for approval or require an amendment to the infrastructure application for the project. The proposed refinements to the project include:

- transmission line and substation design refinements at Gregadoo
- identification of areas where controlled blasting may be required
- use of approved water sources
- use of helicopters and drones.

While most of these activities were described in the EIS, more detail has become available to allow further assessment or more detailed information to be included in the Amendment Report.

Figure ES-2 shows the key components of the amended project and key changes compared to the EIS.



EIS project footprint
Removed footprint
Amendments
Removed project facility
National park and reserve
State forest
Waterbody
Waterway
Major road
Railway

Construction ancillary facilities

1. Wagga 330 kV substation compound (C01)
2. Amended Gregadoo Road compound (C06)
3. Tarcutta accommodation facility and compound (AC03)
4. Ellerslie Road compound (C21)
5. Ardrossan Headquarters Road compound (C17)
6. Green Hills accommodation facility and compound (AC07)
7. Amended Memorial Avenue compound (C14)
8. Snubba Road compound (C18)
9. Maragle 500 kV substation compound (C05)
10. Gadara Road compound (C19)
11. Amended Honeysuckle Road compound (C07)
12. Adjungbilly accommodation facility and compound (AC04)
13. Yass substation compound (C10)
14. Yass accommodation facility and compound (AC05)
15. Crookwell accommodation facility and compound (AC06)
16. Amended Bannaby 500 kV substation compound (C12)

Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:925,000
0 20 40 km

Projection: GDA 1994 MGA Zone 55

HumeLink

Figure ES-2: Key components of the amended project

Which amendments and refinements reflect community concerns and ideas?

Transgrid's proposed amendments made largely in response to issues raised by the community and other stakeholders include:

- **The Green Hills corridor amendment** – An alternative route through Green Hills State Forest to the west of Batlow, proposed by the community, was determined to be preferred to the route proposed in the EIS. The amended corridor aligns with the NSW Government principles of placing transmission infrastructure on public land where feasible. It has the advantage of avoiding property impacts to landowners to the east of Batlow, reduces landscape character and visual amenity impacts, reduces the extent of impacts to native vegetation, increases the distance from the heritage listed Kosciusko National Park for this section of the corridor and improves constructability.
- **Building more temporary accommodation for construction workers** – Local councils and communities were concerned that the influx of construction workers would put pressure on local housing supply and affordability. To avoid this, Transgrid is proposing additional worker facilities, providing more accommodation capacity than was previously planned.
- **Minor changes to the transmission line corridor** – The HumeLink project team has been working closely with easement affected landowners to understand local property constraints. Minor changes to the transmission line corridor are proposed in multiple locations in response to further engagement with easement affected landowners, additional surveys and environmental studies, and design development since public exhibition of the EIS.

How were stakeholders briefed about the proposed amendments and refinements?

Since the public exhibition of the EIS, a large number of engagement activities have been undertaken to support the proposed amendments and refinements. This consultation has been undertaken in various forms with relevant local, State and Commonwealth government authorities, service providers, community groups, affected landowners, Native Title holders, quarry operators and mineral title holders.

More specifically, engagement activities have included:

- briefings to government agencies including NSW Rural Fire Service, Department of Primary Industries (DPI) – Fisheries, DPI – Agriculture, NSW Telco Authority, NSW Forestry Corporation (FCNSW), Transport for NSW, NSW Environment Protection Authority and the NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) including regular meetings with the Biodiversity Conservation Division (BCD)
- briefings and issue-specific technical meetings with local councils including Yass Valley, Goulburn-Mulwaree, Cootamundra Gundagai Regional, Snowy Valleys, Upper Lachlan Shire and Wagga Wagga
- presentations at Community Consultative Group meetings
- meetings and communications with directly impacted landowners by our dedicated Place Managers and Land Access Officers
- use of our Remote Access Communication Hub (RACH) for street meetings with near neighbours (landowners adjacent to the amended project footprint) and the general community
- online and in-person community information sessions with the general community
- consultation with Aboriginal stakeholders including briefings with Registered Aboriginal Parties as part of the consultation and feedback on the Revised Aboriginal Cultural Heritage Assessment Report and engagement with relevant Aboriginal Land Councils on potential native title claims
- letters to potentially affected mineral title holders.

A full description of the consultation activities undertaken during the development of the amended project is provided in Chapter 5.

What are the key environmental, social and economic impacts of the amended project?

The following key environmental, social and economic impacts have been identified for the amended project:

Environmental impacts

- Potential biophysical impacts are primarily associated with the construction phase of the project, when the land is initially disturbed. This mainly relates to impacts on biodiversity and heritage as outlined below:
    - Potential biodiversity impacts are associated with the clearing of native vegetation (around 866 hectares) and impacts on listed threatened ecological communities (around six), threatened flora (around 57 species) and fauna (around 29 species) and endangered fauna populations (around two)
    - While proposed management measures would aim to avoid and minimise impacts on biodiversity, there would be some residual impacts that cannot be further mitigated. These residual impacts would be offset in accordance with the Biodiversity Offsets Scheme
    - For Aboriginal heritage, there is the potential to fully or partially disturb both surface and subsurface features
    - Around 178 Aboriginal heritage sites were recorded within the amended project footprint, of which the majority are stone artefact occurrences and 12 are potential archaeological deposits including previously recorded sites and new sites identified during HumeLink surveys. This is a very conservative number as it represents the amended project footprint which comprises a 200 metre wide transmission line corridor and 30 metre wide assessment area for access tracks. The final easement and access track width would be significantly smaller than assessed. The number of directly impacted sites would be confirmed during further detailed design, which would consider opportunities to further avoid or minimise impacts
    - For non-Aboriginal or historic heritage, two additional items of local heritage significance were identified associated with the amended project footprint. However, there is no impact on the historic items themselves. The overall impact on historic heritage for the amended project remains negligible
- Potential impacts on other biophysical factors such as soil, air quality, flooding and water quality (including surface water and groundwater), would be temporary, short-term, limited in extent, and manageable through standard and proven construction management and mitigation measures
- The main operational impact is associated with permanent changes to land use and property tenure due to transmission infrastructure or access tracks. The area of agricultural land use lost during operation was estimated at 593 hectares. This is equivalent to 0.04 per cent of the total area of agricultural holdings in the region. It is estimated that the amended project would result in up to about 615 hectares of forestry land use being cleared, the vast majority of which would be production native forestry (600 hectares). This is an increase from the EIS and is largely due to the Green Hills corridor amendment. Easement affected landowners would be compensated in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991.*

- Freehold land has been acquired for the development of the proposed Gugaa substation at Gregadoo – this equates to a permanent loss of up to approximately 34 hectares of cropping land use area, which would change to utilities land use.

Social impacts

- Potential positive social impacts include:
  - new employment opportunities, local business participation and skills acquisition for the local community, including Aboriginal people
  - increased tourism and business patronage from temporary workers and their guests
  - reduction in potential impacts associated with the private rental and short-term tourist accommodation market as non-resident workers would be housed in dedicated worker accommodation facilities
  - investment in legacy projects in affected local communities
- During construction, potential negative social impacts include:
  - amenity impacts related to noise and dust generation, reduced visual amenity in proximity to construction ancillary facilities, and traffic and access disruption from the movement of construction vehicles
  - stress for landowners from uncertainty about property acquisitions and new easement arrangements requiring property and access adjustments
  - sudden increase in worker population that may impact on social cohesion and strain social infrastructure in smaller towns
- During operation, potential negative social impacts are associated with:
  - a loss of connection to the land from changes in landscape character and visual amenity due to transmission infrastructure
  - increased livelihood impacts (adjustments to land use) due to potential impact on agricultural and forestry land
- While construction impacts are expected to be temporary, transient and spread across the amended project footprint, Transgrid acknowledges the potential for impacts on residential receivers, business operations and the broader community. Transgrid and the construction contractors would continue to actively manage impacts and engage with stakeholders on ways to minimise impacts.

Economic impacts

- Positive economic impacts during construction are associated with workers spending at local businesses and retailers and supporting local industries such as tourism. The project is anticipated to employ up to 1,600 full-time equivalent construction workers across multiple work fronts during peak construction.
- Potential negative economic impacts during construction are associated with the temporary loss of agricultural and forestry land and associated reductions in productivity. Following construction, it is expected that land not required to support the operation of the project would be returned to its previous condition or as agreed with the landowner
- Operational economic impacts are mainly associated with the permanent loss of productive land for agriculture and forestry uses. While the impact on agricultural enterprises at a regional level was assessed as minimal, the worst-case impact on forestry operations was considered to be more significant

- The net market benefits associated with the project have increased since the EIS, from $491 million to more than $1 billion. This significant increase in net market benefits is primarily driven by:
    - the latest AEMO information on timing of energy generation projects, and
    - emissions targets and renewable energy policies changing the inputs and assessments for AEMO benefits modelling.

A full assessment of the proposed amendments and refinements is presented in Chapter 6 of this Amendment Report.

Additionally, mitigation measures were revised and new measures added in response to issues raised in submissions and consideration of the proposed amendments and refinements to the project. These are presented in Appendix B of this Amendment Report.

Conclusion

HumeLink is a priority project for AEMO and the Commonwealth and NSW governments. HumeLink would deliver a more reliable and more sustainable grid by increasing the amount of renewable energy that can be delivered across the national electricity grid, helping to transition Australia to a low carbon future. Not proceeding with HumeLink would reduce the security of the electricity supply in NSW, particularly as coal-fired generators are retired. It would also discourage energy generation and storage investment within the nearby declared and candidate Renewable Energy Zones.

Since the public exhibition of the EIS, proposed amendments and refinements have been developed and included in the amended project. This is a result of consideration of the issues raised in submissions, feedback received from stakeholders prior to and during the public exhibition of the EIS, and ongoing design and construction methodology development by the construction contractors.

The amended project, including the revised and new mitigation measures provided in Appendix B of this report, would facilitate further avoidance, minimisation or management of potential environmental, social and economic impacts.

Further information on the justification of the amended project is provided in Chapter 7 of this Amendment Report.

Next steps

DPHI will consider the EIS, the Submissions Report and this Amendment Report during its assessment of the project.

DPHI will prepare an assessment report for consideration by the NSW Minister for Planning and Public Spaces, who will then decide whether or not to approve the project (with the amendments and refinements outlined in this Amendment Report), subject to conditions. In accordance with the Assessment Bilateral Agreement (as amended in 2020), if the Minister decides to approve the project, DPHI will provide the Commonwealth Minister for the Environment and Water with its assessment report and NSW conditions of approval. The Commonwealth Minister will then decide whether the project should be approved and, if so, what Commonwealth conditions (if any) should be attached.

If the project is approved, Transgrid will continue to consult with community members, government agencies and other stakeholders during further design development and construction of the project to continue to manage and mitigate impacts, where possible.

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Technical Report 2 – Revised Aboriginal Cultural Heritage Assessment Report
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Technical Report 7 – Social Impact Assessment Addendum
Technical Report 8 – Landscape Character and Visual Impact Assessment Addendum
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Abbreviations

Acronym	Description
ABS	Australian Bureau of Statistics
AEC	areas of environmental concern
AEMO	Australian Energy Market Operator
AEP	annual exceedance probability
AGL	above ground level
AHIMS	Aboriginal Heritage Information Management System
AIP	Aquifer Interference Policy
ALA	Aircraft landing area
ALC	Aboriginal Land Claims
ANO	Authorised Network Operator
APZ	Asset Protection Zone
BAM	Biodiversity Assessment Methodology
BC Act	*Biodiversity Conservation Act 2016*
BFEMEP	Bush Fire Emergency Management and Evacuation Plan
BFPL	Bush Fire Prone Land
BOS	Biodiversity Offsets Scheme
BSAL	biophysical strategic agricultural land
BYDA	Before You Dig Australia
CASA	Civil Aviation Safety Authority
CCG	Community Consultative Group
CIV	capital investment value
CNVG	*Construction Noise and Vibration Guidelines*
CSEMP	Community and Stakeholder Engagement Management Plan
CSSI	Critical State Significant Infrastructure
dB	decibel
dBA	decibel A-weighted
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPE	Department of Planning and Environment
DPHI	Department of Planning, Housing and Infrastructure
DPI	Department of Primary Industries
DPI Fisheries	Department of Primary Industries - Fisheries
DPIE	Department of Industry and Environment
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	NSW Environmental Planning and Assessment Regulation 2021

Acronym	Description
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EMF	electric and magnetic fields
ENM	excavated natural material
ESD	Ecologically Sustainable Development
FCNSW	Forestry Corporation of NSW
FTE	full-time equivalent
GDE	Groundwater dependent ecosystem
GHG	Greenhouse gas
GIS	Geographical Information System
GRP	Gross Regional Product
GVA	gross value added
ha	hectares
HLS	Helicopter standing area
HNA	Highly Noise Affected
HV	Heavy vehicle
IAQM	Institute of Air Quality Management
ICNIRP	International Commission on Non-Ionizing Radiation Protection
I-O	Input-Output
ISP	*Integrated System Plan*
km	Kilometres
kV	Kilovolt
L_{aeq}	The average noise level during a measurement period, such as the day-time or night-time
LALC	Local Aboriginal Land Council
LAO	Land Access Officer
LEP	local environmental plan
LGA	Local Government Area
LoS	Level of Service
LV	Light vehicle
ML	Megalitres
MW	Megawatt
MNES	Matters of national environmental significance
NCC	National Construction Code
NEM	National Electricity Market
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measures
NHL	National Heritage List
NML	noise management level
NOA	naturally occurring asbestos
NPI	National Pollutant Inventory

Acronym	Description
NPV	net present value
NSW	New South Wales
NVMP	Noise and Vibration Management Plan
ODP	Optimal Development Path
OECC	Former Office of Energy and Climate Change
OEW	overhead earth wire
OOHW	Out of Hours Work
OPGW	optical ground wire
OSOM	oversized and/or overmass
PAD	Potential Archaeological Deposit
PBP	*Planning for Bush Fire Protection: A guide for councils, planners, fire authorities and developers*
PFAS	per- and poly-fluorinated alkyl substances
PM	Place Manager
PMP	Property Management Plan
PNTL	project noise trigger level
POEO Act	*Protection of the Environment Operations Act 1997*
RAAF	Royal Australian Air Force
RACH	Remote access communication hub
RAP	Registered Aboriginal Parties
REZ	renewable energy zone
RNE	Register of the National Estate
RNP	*NSW Road Noise Policy*
SEARs	Planning Secretary's Environmental Assessment Requirements
SFPP	Special Fire Protection Purpose
SHR	State Heritage Register
SIA	Social Impact Assessment
SSAL	State significant agricultural land
TEC	threatened ecological communities
TSR	Travelling stock reserve
UXO	Unexploded Ordnance
VNI West	Victoria to NSW interconnector West
WAL	Water Access Licence
WSP	Water Sharing Plan

Glossary of terms

Term	Description
access routes	Roads providing the access to and from the project footprint.
aerodrome	Areas that are suitable for the arrival, departure and surface movement of aircraft.
amenity	'*The pleasantness of a place as conveyed by desirable attributes including visual, noise, odour etc*.' (Australian Institute of Landscape Architects QLD, 2018).
amended project (the)	The CSSI project "HumeLink", which is the subject of the Amendment Report and inclusive of the proposed amendments and project refinements to the project as described in the EIS. The project involves the construction and operation of high voltage transmission lines and associated infrastructure between Wagga Wagga, Bannaby and Maragle.
amended project footprint (the)	The area that has been assumed for the purpose of the Amendment Report to be directly affected by the construction and operation of the project. It includes the indicative location of project infrastructure, the area that would be directly disturbed during construction and any easement required during operation.
amendment	A change in what the proponent is seeking approval for following the public exhibition of the EIS. It requires changes to the project description in the EIS and amendments to the associated infrastructure application.
areas of environmental concern	Potential contamination sources are referred to as areas of environmental concern.
Asset Protection Zone	A bushfire protection measure, providing a buffer around assets. Asset Protection Zones (APZs) are designed and maintained to reduce fuel near assets, and to reduce the potential for damage from direct flame contact, smoke, radiant heat, and ember attack. The dimensions for APZs are designed in line with *Planning for Bush Fire Protection: A guide for councils, planners, fire authorities and developers* (NSW RFS, 2019), and are determined by surrounding vegetation type, slope, and the type of asset/development.
brake and winch site	A brake and winch site is a temporarily cleared area where plant and equipment are located to spool and winch conductors into place on transmission line structures. The locations of the brake and winch sites may or may not be within the nominated transmission line easement. These sites are only required for construction of the project and do not need to be maintained during operation.
bushfire	An uncontrolled fire in a bush area.
climate change	A change in global or regional climate patterns, in particular a change apparent from the mid to late 20th century onwards and attributed, largely, to the increased levels of atmospheric greenhouse gases.
construction compounds	Main construction compounds proposed for construction of the project. Each construction compound would accommodate a range of facilities which may include (but not limited to): • laydown areas • site offices • amenities • construction support facilities such as vehicle and equipment storage, maintenance sheds, chemical/fuel stores and stockpile areas • concrete batching plants • helipads • crushing/screening plants • parking.
consumption induced impacts	Consumption induced impacts in the locality or region refer to the additional economic activity generated from increased demand for goods and services from the project workers earning wages. These workers would generate demand in the region for accommodation, food, commercial and personal services, transport, etc.
Critical State Significant Infrastructure	Critical State Significant Infrastructure (CSSI) projects are high priority infrastructure projects that are essential to the State for economic, social or environmental reasons.

Term	Description
double-circuit transmission lines	A double circuit transmission line carries six conductors (ie two circuits) on a single transmission line structure.
EIS project (the)	The CSSI project "HumeLink", which was the subject of the Environmental Impact Statement. The project involves the construction and operation of high voltage transmission lines and associated infrastructure between Wagga Wagga, Bannaby and Maragle.
EIS project footprint (the)	The area that was assumed for the purpose of the EIS to be directly affected by the construction and operation of the project. It includes the indicative location of project infrastructure, the area that would be directly disturbed during construction and any easement required during operation.
electric and magnetic fields	Electric and magnetic fields (EMF) are part of the natural environment and are present in the earth's core and the atmosphere. These fields are also produced wherever electricity or electrical equipment is used.
flood immunity	Not affected by flooding for a specified flood event.
future Maragle 500 kV substation	The future Maragle 500/330 kV substation that would be built under the approved Snowy 2.0 Transmission Connection Project, which is subject to separate planning approval (reference SS1-9717, EPBC 2018/836).
greenhouse gas	A gas that absorbs and emits radiant energy within the thermal infrared range.
gross regional product	A measure of size or net wealth generated by the local economy.
historic item	An item that is of historic heritage significance. Historic heritage is non-Aboriginal heritage.
HumeLink	The project
hydraulic	The science of water movement along channels, floodplains, pipes and other structures that convey water.
hydrology	Assessment of rainfall and runoff processors in a catchment area.
job years	A job year is one full-time equivalent job over one year. This is used to measure jobs generated and supported in design and construction. This unit of measure is better than jobs because construction has a short life and hence the jobs are not permanent. Dividing the number of job years by the number of years of construction gives the average number of jobs during construction.
key communities	The key communities include the towns and urban centres within the social locality which are most likely to experience direct impacts relating to the accommodation of non-resident workers – including availability of housing, impacts to the economy and access to social infrastructure and services.
landowners	People who own properties/land.
landscape	'*All aspects of a tract of land, including landform, vegetation, buildings, villages, towns, cities and infrastructure*.' (TfNSW, 2020)
landscape character	The '*combined quality of built, natural and cultural aspects which make up an area and provide its unique sense of place'*. (TfNSW, 2020)
landscape character zone	'*An area of landscape with similar properties or strongly defined spatial qualities, distinct from areas immediately nearby*.' (TfNSW, 2020)
level of service	A measure of the performance of a road network which typically considers an assessment of various factors including speed, volume of traffic, geometric features, traffic interruptions, delays, and freedom to manoeuvre.
micro-siting	Micro-siting is a detailed design process to determine the specific location of transmission line structures or other project infrastructure within a broader assessed footprint. The process considers local environmental and engineering constraints and proposed mitigation measures to minimise environmental and community impacts when determining the final locations where reasonable and feasible.

Term	Description
Obstacle limitation surface	Defines the airspace surrounding an airport that must be protected from obstacles to ensure aircraft flying in good weather during the initial stages and final stages of a flight, or in the vicinity of the airport, can do so safely.
oversized and/or over mass	A heavy vehicle carrying, or designed for the purpose of carrying, a large item that cannot be divided without extreme effort, expense or risk of damage to it, or cannot be carried on any heavy vehicle without contravening a mass requirement or dimension requirement.
Procedures for Air Navigation Services- Aircraft Operations	A traffic control acronym which stands for Procedures for Air Navigation Services – Aircraft Operations.
particulate matter	A category of airborne particles which is classified in relation to its size as either: • PM_{10} particles which are sufficiently small enough to penetrate the large airways of the lungs • $PM_{2.5}$ particles which are generally small enough to be drawn in and deposited into the deepest portions of the lungs.
Proponent	The entity seeking approval for the CSSI application, which, for the HumeLink project is NSW Electricity Networks Operations Pty Ltd (referred to as Transgrid).
Proposed Gugaa 500 kV substation	The new 500/330 kV substation proposed near Wagga Wagga.
refinement	Refinements to the project are defined as aspects of the project that generally fit within the limits set by the project description in the EIS. Refinements do not change what is being sought for approval or require an amendment to the infrastructure application for the project.
restricted access vehicle	Any vehicle which exceeds the overall dimensions of vehicles as defined in the Heavy Vehicle National Law (NSW).
Scope 1 emissions	Direct GHG emissions released to the atmosphere as a direct result of an activity, or series of activities at a facility level.
Scope 2 emissions	Indirect GHG emissions released to the atmosphere from the indirect consumption of an energy commodity.
Scope 3 emissions	Indirect GHG emissions other than Scope 2 emissions that are generated in the wider economy that occur as a consequence of the activities of a facility, but from sources not owned or controlled by that facility's business.
sensitive receptor	A location where people are likely to work or reside; this may include a dwelling, school, hospital, office or public recreational area.
sensitivity (of a landscape or view)	'Susceptibility of a landscape or receptor to accommodate change without losing valued attributes.' (Australian Institute of Landscape Architects QLD, 2018) '*The sensitivity of a landscape character zone or view is 'its capacity to absorb* change'. (TfNSW, 2020)
social impacts	The consequences experienced by individuals, households, groups, communities, or organisations as a result of the project.
Social locality	A social study area has been defined based on the scale and nature of the predicted social impacts of the project and the considerations in the SIA Guideline. The social study area may also be referred to as the 'social locality' as indicated in the SIA Guideline.
social infrastructure	Community facilities and services which meet social needs and community wellbeing.
spoil	Excavated soil and rock
Strahler stream order	Strahler stream order classification is a 'top down' system in which streams of the first order have no upgradient streams flowing into them (DPI 2018). If two streams of the same order merge, the resulting stream is given a number that is one higher. If two rivers with different stream orders merge, the resulting stream is given the higher of the two numbers. Under the Strahler stream order classification, 1st to 3rd order streams are called headwater streams. Streams classified as 4th through 6th order are medium streams and streams that are 7th order or larger are a river.

Term	Description
Transgrid	The project is proposed to be undertaken by NSW Electricity Networks Operations Pty Ltd (referred to as Transgrid). Transgrid is the operator and manager of the main high voltage transmission network in NSW and the ACT, and is the Authorised Network Operator for the purpose of an electricity transmission or distribution network under the provisions of the *Electricity Network Assets (Authorised Transactions) Act 2015*.
transmission line corridor	An area generally 200 metres wide that the transmission line route and easement would be located within.
Transmission line easement	A legal right attached to a parcel of land that enables the non-exclusive use of the land by a third party other than the owner. For transmission lines, an easement defines the corridor area where the lines are located and that allows access, construction and maintenance work to take place. The easements for the 500 kV transmission lines would typically be 70 metres wide. However, a few select locations would require wider easements up to 130 metres wide for specific engineering or property reasons. The easement grants a right of access and for construction, maintenance and operation of the transmission line and other operational assets.
transmission line route	The location of the transmission line structures along the middle of the transmission line easement.
transmission line structures	Proposed free standing structures to support the transmission lines.
transposition	Transposition is the periodic swapping of positions of conductors on a transmission line in order to improve transmission reliability.
view	'*Any sight, prospect or field of vision as seen from a place, and may be wide or narrow, partial or full, pleasant or unattractive, distinctive or nondescript, and may include background, mid ground and/or foreground elements or features*.' (Australian Institute of Landscape Architects QLD, 2018)
viewpoint	'*The specific location of a view, typically used for assessment purposes*.' (Australian Institute of Landscape Architects QLD, 2018)
Wagga 330 kV substation	The existing 330/132 kV substation located in Wagga Wagga.
waterway crossing	A crossing over water established for access.
work site	A general word to describe a defined construction location.
worker accommodation facilities	Temporary worker accommodation facilities that would be established for the construction workers.

1. Introduction

This chapter provides the background to the project, a description of the key features of the project as described in the Environmental Impact Statement (EIS), the proposed amendments and refinements made to the project and outlines the purpose and structure of this report.

1.1. Background

Transgrid proposes to increase the energy network capacity in southern New South Wales (NSW) through the development of new 500 kilovolt (kV) high-voltage transmission lines and associated infrastructure between Wagga Wagga, Bannaby and Maragle. This project is collectively referred to as HumeLink. The project, as exhibited, would be located across five Local Government Areas (LGAs) including Wagga Wagga City, Snowy Valleys, Cootamundra-Gundagai Regional, Upper Lachlan Shire and Yass Valley. HumeLink is a priority project for the Australian Energy Market Operator (AEMO) and the Commonwealth and NSW governments and has been declared as Critical State Significant Infrastructure (CSSI). The project would deliver a cheaper, more reliable and more sustainable grid by increasing the amount of renewable energy that can be delivered across the national electricity grid, helping to transition Australia to a low carbon future.

An EIS was prepared to support Transgrid's application for approval of the project in accordance with the requirements of Division 5.2 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The EIS was placed on public exhibition by the NSW Department of Planning, Housing and Infrastructure (DPHI) (formerly the NSW Department of Planning and Environment (DPE)) for a period of 42 days, commencing 30 August 2023 and concluding 10 October 2023.

During the public exhibition, the HumeLink project team undertook a number of in-person and online activities to engage with the general community and provide landowners, impacted communities, local government, and businesses with information on the EIS and the submission process. Submissions to the EIS were made directly to DPHI online via the Major Projects Planning Portal or by post.

A separate Submissions Report (Aurecon, 2024a) has also been prepared to respond to the submissions received during public exhibition of the EIS and should be read in conjunction with this Amendment Report.

1.2. Key features of the project (as publicly exhibited)

The key components of the project as outlined and assessed in the EIS included:

- construction and operation of around 360 kilometres of new double circuit 500 kV transmission lines and associated infrastructure between Wagga Wagga, Bannaby and Maragle
- construction of a new 500/330 kV substation at Gregadoo (Gugaa 500 kV substation) approximately 11 kilometres south-east of the existing Wagga 330/132 kV substation (Wagga 330 kV substation)
- demolition and rebuild of a section of Line 51 (around two kilometres in length) as a double circuit 330 kV transmission line connecting into the Wagga 330 kV substation
- modification of the existing Wagga 330 kV substation and Bannaby 500/330 kV substation (Bannaby 500 kV substation) to accommodate the new transmission line connections
- connection of transmission lines to the future Maragle 500/330 kV substation (Maragle 500 kV substation, approved under the Snowy 2.0 Transmission Connection Project (SSI-9717))

- provision of one optical repeater telecommunications hut and associated connections to existing local electrical infrastructure
- establishment of new and/or upgraded temporary and permanent access tracks
- ancillary works required for construction of the project such as construction compounds, worker accommodation facilities, utility connections and/or relocations, brake and winch sites, and helipad/helicopter support facilities.

Where aspects of the project infrastructure or construction method have been amended or refined following public exhibition, these changes have been described in Chapter 3 (Description of the amended project) of this Amendment Report and the revised project description and construction chapters included in Appendix A.

1.3. Overview of the proposed amendments and refinements

Transgrid has engaged with government agencies, councils, landowners, near neighbours, communities and other key stakeholders during and since the public exhibition of the EIS. Engagement has formed an integral part of the project's development and has provided communities and stakeholders the opportunity to offer feedback on the proposed project amendments and refinements.

As outlined in Section 3.1 of this Amendment Report, Transgrid has identified several proposed amendments and refinements to the project as described in the EIS. These amendments and refinements reflect functional improvements to the design and construction methodology of the project. They have been made in response to:

- feedback received from stakeholders prior to, during and following the public exhibition of the EIS
- comments made in formal submissions on the EIS
- ongoing design and construction methodology development by the construction contractors.

Amendments are defined as changes to the project that the proponent is seeking approval for which are made following the exhibition of the EIS. Project amendments require changes to the project description in the EIS and amendments to the associated infrastructure application. The proposed amendments to the project include:

- changes to the transmission line corridor including the realignment of the route through Green Hills State Forest to the west of Batlow
- changes to the number and location of construction ancillary facilities, including worker accommodation facilities and construction compounds
- nomination of access tracks to support the construction and operation of the project
- additional telecommunications connections to existing substations.

Refinements to the project are defined as aspects of the project that generally fit within the limits set by the project description in the EIS. Refinements do not change what is being sought approval for or require an amendment to the infrastructure application for the project. For completeness, these refinements have been covered in this amendment report. The proposed refinements to the project include:

- transmission line and substation design refinements at Gregadoo
- identification of areas where controlled blasting may be required
- use of approved water sources
- use of helicopters and drones.

The project, including the proposed amendments and refinements, is referred to as the 'amended project'. The project, as described and assessed in the EIS, is referred to as the 'EIS project'.

The amended project would be located across six LGAs including Wagga Wagga City, Snowy Valleys, Cootamundra-Gundagai Regional, Upper Lachlan Shire, Yass Valley and Goulburn Mulwaree.

Figure 1-1 shows the location of the amended project and Figure 1-2 shows the key components of the amended project. Chapter 3 (Description of the amended project) and Appendix A (Updated project description) of this report provide further detail on the proposed amendments and refinements.

1.4. The proponent

The proponent is NSW Electricity Networks Operations Pty Ltd[1] (referred to as Transgrid). Transgrid operates and manages the main high voltage transmission network in NSW and the ACT and is the Authorised Network Operator (ANO) for the purpose of an electricity transmission or distribution network under the provisions of the *Electricity Network Assets (Authorised Transactions) Act 2015*.

1.5. Purpose of this Amendment Report

In accordance with clause 179(2) of the NSW Environmental Planning and Assessment Regulation 2021 (EP&A Regulation), an application may, with the approval of the Planning Secretary, be amended at any time before the application is determined. The purpose of an Amendment Report is to assess the economic, environmental and social impacts of project changes to help the community, councils, government agencies and the approval authority (DPHI) get a better understanding of the proposed amendments and refinements to the project as publicly exhibited and evaluate the potential impacts in order for the Minister of Planning and Public Spaces to make decisions on the merits of the overall amended project. Where required, the Amendment Report has included additional or revised environmental management measures to manage or minimise environmental impacts.

The Minister for Planning and Public Spaces will subsequently determine whether to grant approval, or to refuse the project, under the EP&A Act. Approval from the Minister is required before Transgrid can proceed with the project.

Given the status of the project as a controlled action under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), the project would also be assessed using the bilateral assessment process by the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) for the required Commonwealth approval. The assessment of matters of national environmental significance (MNES) for the amended project is subject to a *request to vary a proposal* issued to DCCEEW under the provisions of the EPBC Act and the Commonwealth Environment Protection and Biodiversity Conservation Regulations 2000.

[1] NSW Electricity Networks Operations Pty Ltd ACN: 609169959
Proponent address: 180 Thomas St, Haymarket, 2000, NSW, Australia

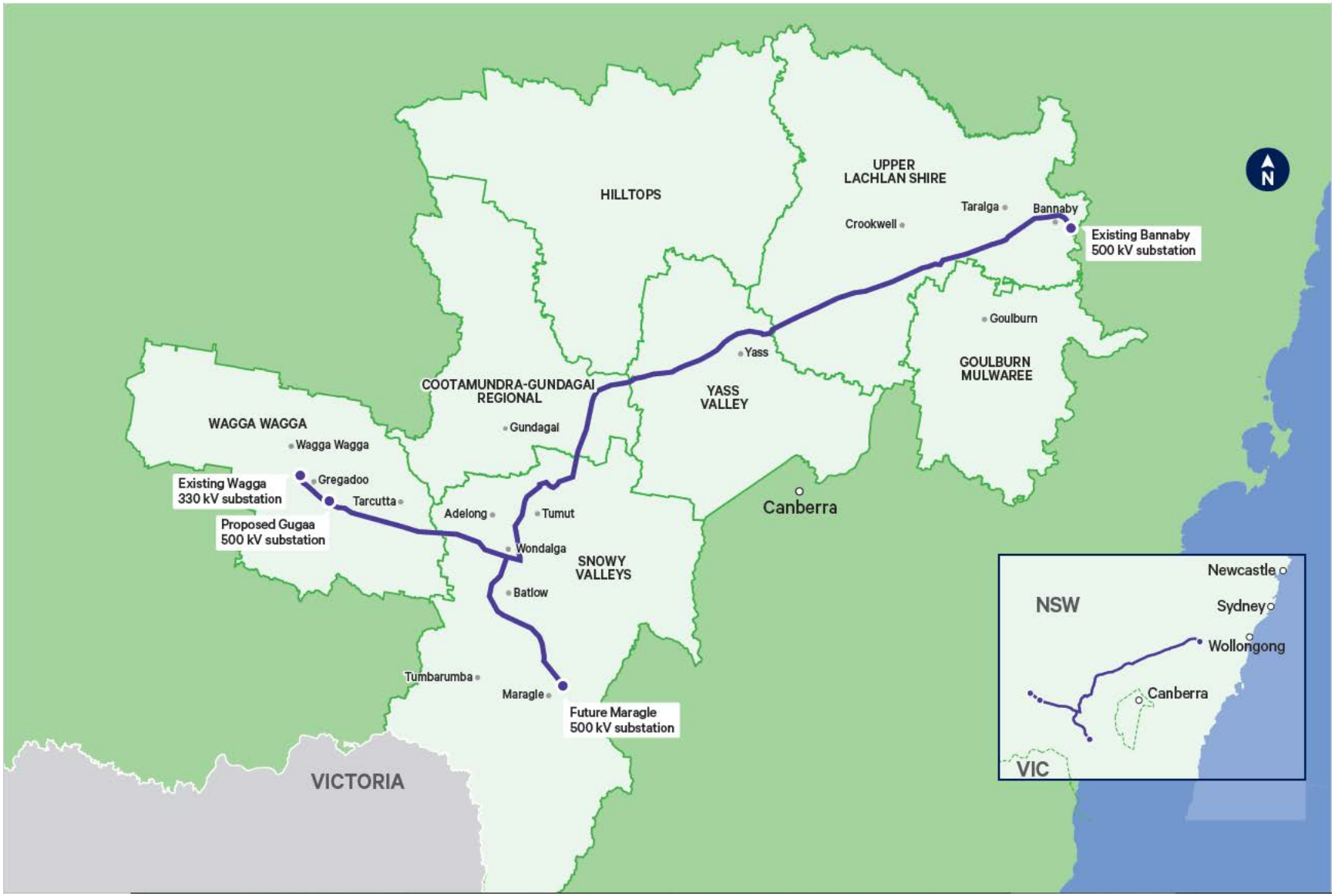
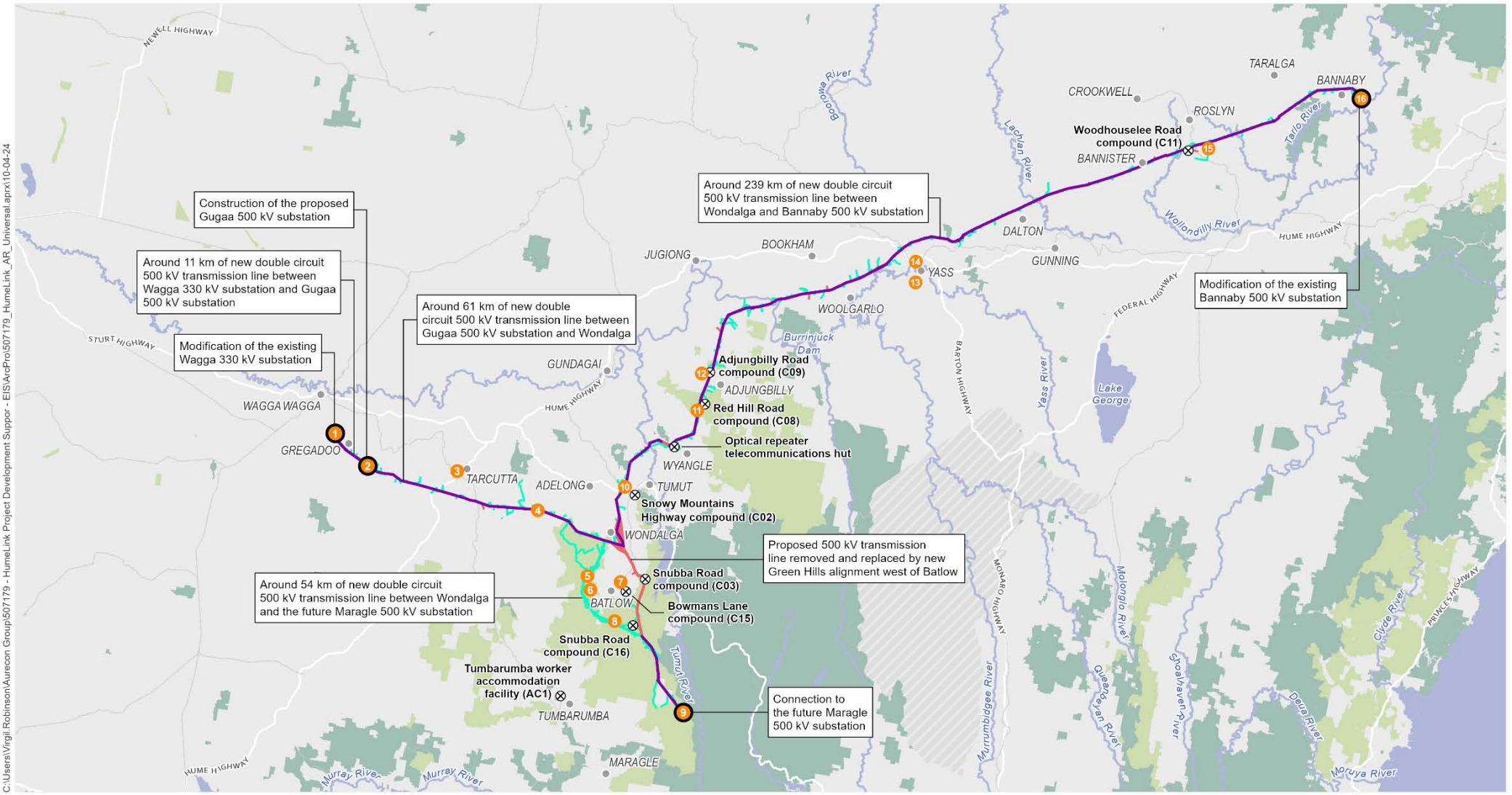


Figure 1-1 Overview of the amended project location



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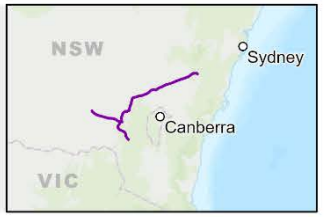
EIS project footprint
Removed footprint
Amendments
Removed project facility
National park and reserve
State forest
Waterbody
Waterway
Major road
Railway

Construction ancillary facilities

1. Wagga 330 kV substation compound (C01)
2. Amended Gregadoo Road compound (C06)
3. Tarcutta accommodation facility and compound (AC03)
4. Ellerslie Road compound (C21)
5. Ardrossan Headquarters Road compound (C17)
6. Green Hills accommodation facility and compound (AC07)
7. Amended Memorial Avenue compound (C14)
8. Snubba Road compound (C18)
9. Maragle 500 kV substation compound (C05)
10. Gadara Road compound (C19)
11. Amended Honeysuckle Road compound (C07)
12. Adjungbilly accommodation facility and compound (AC04)
13. Yass substation compound (C10)
14. Yass accommodation facility and compound (AC05)
15. Crookwell accommodation facility and compound (AC06)
16. Amended Bannaby 500 kV substation compound (C12)



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:925,000
0 20 40 km

Projection: GDA 1994 MGA Zone 55

HumeLink

Figure 1-2: Key components of the amended project

1.6. Structure of this Amendment Report

This Amendment Report has been structured in line with the S*tate significant infrastructure guidelines – preparing an amendment report* (DPE, 2022a) as follows:

- Chapter 1 (Introduction) – provides an overview of the project, the proposed amendments and refinements and the purpose of this report.
- Chapter 2 (Strategic context) – identifies any changes to the strategic context of the project arising from the proposed amendments and refinements.
- Chapter 3 (Description of the amended project) – provides a description of the proposed amendments and refinements.
- Chapter 4 (Statutory context) – provides an outline of the key legislative requirements and policy guidelines relating to the proposed amendments and refinements.
- Chapter 5 (Engagement) – summarises the community and stakeholder engagement that has been undertaken during the development of this report and assessment of the proposed amendments and refinements.
- Chapter 6 (Assessment of impacts) – describes the potential impacts during construction and operation associated with the proposed amendments and refinements.
- Chapter 7 (Justification of the amended project and conclusion) – provides an evaluation of the justification and conclusion of the amended project.
- Chapter 8 (References) – identifies the key information sources (including reports and documents) used to inform this report.
- Appendices
    - Appendix A (Updated project description) – updates and supersedes the project description provided in Chapter 3 (Project description – infrastructure) and Chapter 4 (Project description – construction) of the EIS.
    - Appendix B (Updated mitigation measures) – outlines the proposed mitigation measures for the amended project.
    - Appendix C (Updated statutory compliance table) – outlines the environmental planning related statutory requirements for consideration in the environmental assessment of the amended project.
    - Appendix D (Engagement Outcomes Report) – provides a summary of engagement activities undertaken throughout the development of this Amendment Report.
- Technical reports prepared to support this Amendment Report include:
    - *Technical Report 1 – Revised Biodiversity Development Assessment Report*
    - *Technical Report 2 – Revised Aboriginal Cultural Heritage Assessment Report*
    - *Technical Report 3 – Historic Heritage Impact Assessment Addendum*
    - *Technical Report 4 – Agricultural Impact Assessment Addendum*
    - *Technical Report 7 – Social Impact Assessment Addendum*
    - *Technical Report 8 – Landscape Character and Visual Impact Assessment Addendum*
    - *Technical Report 9 – Noise and Vibration Impact Assessment Addendum*
    - *Technical Report 10 – Phase 1 Contamination Assessment Addendum*
    - *Technical Report 11 – Hydrology and Flooding Impact Assessment Addendum*

- *Technical Report 12 – Surface Water and Groundwater Impact Assessment Addendum*
- *Technical Report 13 – Bushfire Risk Assessment Addendum*
- *Technical Report 16 – Revised Traffic and Transport Impact Assessment*
- *Technical Report 17 – Air Quality Impact Assessment Addendum*

Note: Numbering of technical reports remain as per the EIS for consistency, however no addendum reports were required for *Technical Report 5 – Land Use and Property Impact Assessment*, *Technical Report 6 – Economic Impact Assessment*, *Technical Report 14 - Aviation Impact Statement*, *Technical Report 15 - Electric and Magnetic Fields* or *Technical Report 18 – Greenhouse Gas Assessment Addendum*.

2. Strategic context

This chapter provides an overview of the strategic context and need for the amended project.

2.1. Overview of strategic and government policy context for the amended project

The strategic context and need for the project is detailed in Chapter 2 (Strategic context and project need) of the EIS. Section 2.1 of the EIS outlined the challenges facing the existing energy market and the urgent need for future power generation to both reduce emissions and encourage a shift towards renewable energy opportunities. To support this shift, the existing transmission infrastructure networks need to be expanded to connect to these new sources of energy generation.

Overall, the proposed amendments and refinements identified in this Amendment Report would generally fall within the same strategic and government policy context as presented in the EIS. Engagement has formed an integral part of the project's development and has provided communities and stakeholders the opportunity to offer feedback on the proposed project amendments and refinements in alignment with the NSW Government *Undertaking Engagement Guidelines for State Significant Projects* (DPHI, 2024a). Furthermore, the preferred transmission line corridor route west of Batlow through Green Hills State Forest aligns with draft NSW Government principles on placing transmission infrastructure on public land, where feasible (DPE, 2023a).

Sections 2.2 and 2.3 of the EIS outlined the strategic planning response to the identified challenges facing the existing energy market, including consideration of the project against both NSW and Commonwealth government policy contexts such as its alignment with the:

- NSW Transmission Infrastructure Strategy (DPE, 2018)
- NSW Electricity Strategy (DPIE, 2019)
- NSW Government's Net-Zero Plan Stage 1: 2020–2030 (DPIE, 2020a)
- *2022 Integrated System Plan* (2022 ISP, Australian Energy Market Operator (AEMO), 2022)
- Commonwealth government's Climate change policy.

The 2022 ISP identified HumeLink as a key "actionable" project, to be "progressed urgently" with the latest delivery date of July 2026 in order to directly address the risk of not enough dispatchable capacity available if there are early coal-fired generator closures in the period 2026 to 2028 (AEMO, 2022). Since the EIS public exhibition, the draft *2024 Integrated System Plan* (2024 ISP) has been released providing slightly updated timing and staging for HumeLink compared to the 2022 ISP. The draft 2024 ISP states that the northern circuit of HumeLink (Wagga Wagga to Bannaby) is targeted to be operational by July 2026 and the southern circuit of HumeLink (connecting to Maragle) is targeted to be operational by December 2026 as per Transgrid's stated timeframes. The draft 2024 ISP also confirms the role of HumeLink in providing the National Electricity Market better access to energy storage assets that can "mitigate renewable droughts and balance energy across seasons". Furthermore, if HumeLink is not delivered on time, more long-duration storage than otherwise anticipated under the *NSW Electricity Infrastructure Roadmap 2020* (DPIE, 2020b) (as detailed in Section 2.3.3 of the EIS) and/or additional gas-fired generation would be needed to maintain the reliability of the power system in NSW (AEMO, 2022).

2.1.1. Project need

The Australian energy landscape and its supporting infrastructure requirements is transitioning. In NSW, existing coal-fired generators are being progressively retired and as a result, there is a pressing and urgent need for new sources of supply to meet existing and growing energy demand. New sources of energy generation will largely consist of renewable energy projects.

In response, the transmission infrastructure networks need to be expanded to connect renewable generation. Expansion is required as load centres are primarily located along the eastern, coastal regions of NSW where coal-fired generation has been traditionally located. Areas of greatest potential for new renewables are distant from these existing load centres. Whilst the existing network will continue to play an important role, it only has enough capacity to connect around five per cent of these potential new renewable energy projects according to the *NSW Transmission Infrastructure Strategy* (DPE, 2018).

HumeLink – which would comprise new 500 kV transmission lines and associated infrastructure between Wagga Wagga, Bannaby and Maragle – would be a key component of the energy transition. It would open up additional capacity for new generation, primarily renewable wind and solar generation in southern NSW, and improve wholesale market competition, thereby lowering electricity costs. It would also help unlock the full potential of the Snowy 2.0 project by increasing transmission capacity and enable greater sharing of energy across the eastern states.

Other key strategic factors driving the need for HumeLink are to:

- address climate change, and to meet the Commonwealth and State government commitments to reduce carbon emissions and greenhouse gases (GHGs)
- reinforce stability and reliability in the network
- facilitate development of new renewable energy generation in the Wagga Wagga and Tumut renewable energy zones (REZs), which are candidate REZs as per the 2022 and draft 2024 ISPs, and the South West NSW REZ, which is a declared REZ (refer to Figure 2-1).

Overall, the proposed amendments and refinements identified in this Amendment Report would satisfy the project need as presented in the EIS. That is, HumeLink (being the amended project) would deliver a more reliable and more stable energy distribution network by increasing the amount of renewable energy that can be delivered across the national electricity grid, helping to transition Australia to a low carbon future.

2.1.2. Relationship to other projects

HumeLink would support several other critical energy projects identified in the 2022 ISP and draft 2024 ISP in the transition of the National Electricity Market (NEM) to lower cost and low-emission renewable energy sources.

In particular, HumeLink would have a direct interface with the Snowy 2.0 – Transmission Connection project at the future Maragle 500 kV substation and with Project EnergyConnect (NSW – Eastern Section) at the existing Wagga 330 kV substation (refer to Figure 2-1). Both projects have received planning approval by the NSW and Commonwealth Governments.

The EIS also acknowledged there was potential for the proposed Victoria to NSW Interconnector West (VNI West) project to intersect the HumeLink project footprint between the existing Wagga 330 kV substation and proposed Gugaa 500 kV substation. Since exhibition of the EIS, the proposed scope of work for VNI West has progressed. It has now been confirmed there are VNI West scope interactions with HumeLink between the existing Wagga 330 kV substation and the proposed Gugaa 500 kV substation. The VNI West

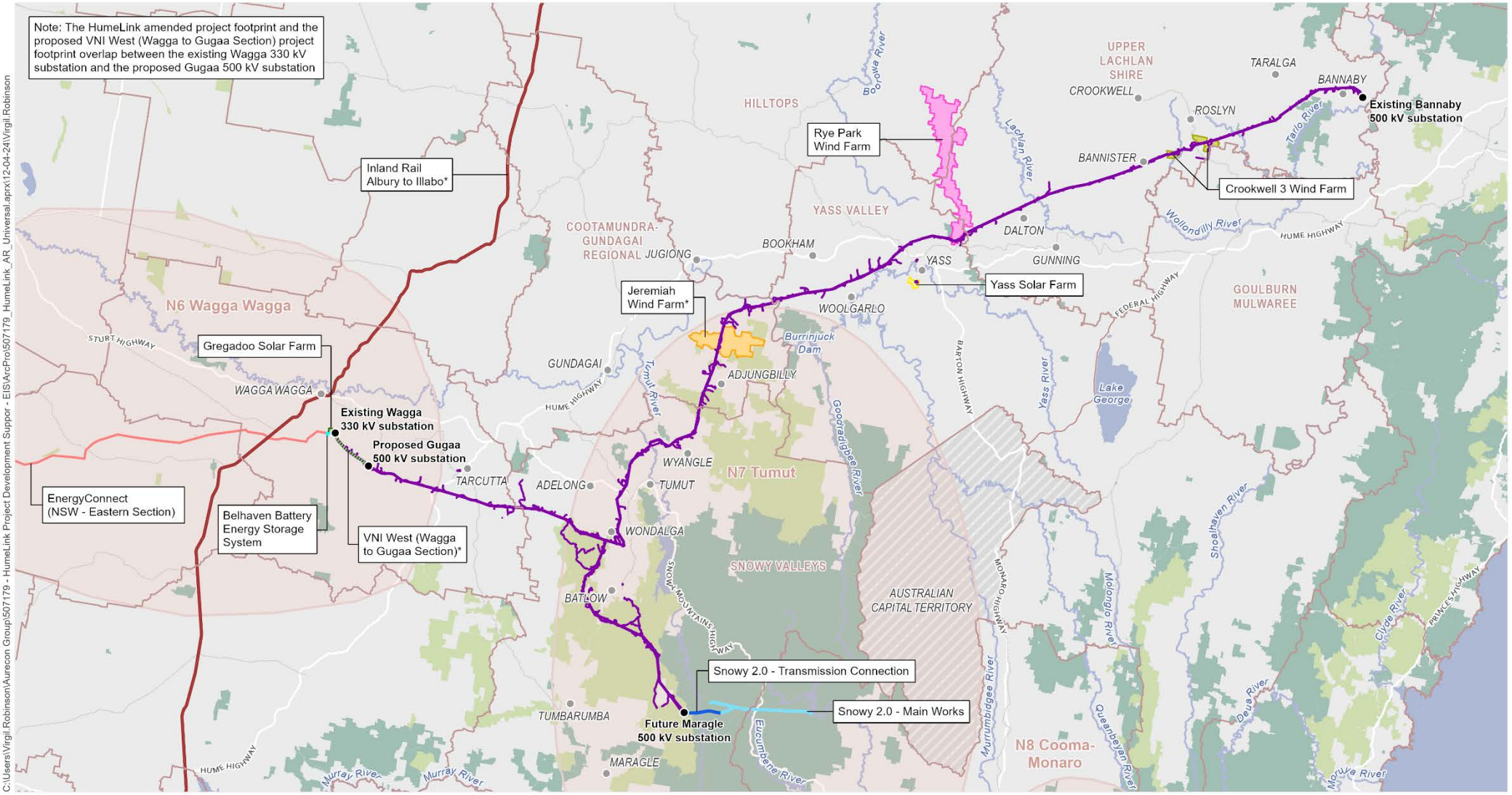
component at Gregadoo is required for the strategic interconnection of Project EnergyConnect, HumeLink and VNI West to facilitate the 500 kV load share between NSW and Victoria. This work would need to be undertaken when the VNI West project has connected the new 500 kV line from the NSW and Victoria border to the Dinawan substation (to be built as part of EnergyConnect (NSW – Eastern Section)).

The energisation of the transmission line between the existing Wagga 330 kV substation and the proposed Gugaa 500 kV substation at 500 kV has been assessed as a refinement of the amended project. This would facilitate the operation of the future VNI West project, once commissioned. This refinement also includes additional infrastructure at the proposed Gugaa 500 kV substation which would facilitate the integration of the future VNI West project. Further detail of this refinement is presented in Section 3.6 of this Amendment Report.

The need for HumeLink alongside these other projects is supported by the draft 2024 ISP, which states that *"further development of new generation [in the South West NSW REZ] requires network augmentation towards the greater Sydney load centre. The capacity within this REZ and ability to transfer energy from the REZ to the main load centres in the greater Sydney area will be improved with the construction of Project EnergyConnect and HumeLink projects. Furthermore, VNI West also increases the capacity of this REZ"* (AEMO, 2024).

As stated in the *2019 Electricity Statement of Opportunities* (AEMO, 2019), the full benefits of new renewable generation, including upgrades to the Snowy Hydro Scheme (Snowy 2.0), cannot be realised without an associated increase in transmission capacity. HumeLink would provide this additional capacity. This is supported by the draft 2024 ISP, which states that *"the HumeLink project will enable the connection of more than 2,000 MW of pumped hydro generation (Snowy 2.0) in the Tumut REZ area".* This is because "currently the 330 kV transmission network around Lower and Upper Tumut is congested during peak demand periods" (AEMO, 2024). Section 6.18 of this Amendment Report provides more detail on these projects as well as other relevant nearby projects that may result in cumulative impacts or benefits with HumeLink during construction and/or operation.

Figure 2-1 shows the location of the amended project relevant to the other projects mentioned above and the nearby REZs as outlined in the draft 2024 ISP.



HumeLink

FIGURE 2-1: Location of the amended project relevant to candidate REZs as per 2022 ISP

2.2. Key benefits of the amended project

As detailed in Section 1.1.4 of the EIS, the anticipated benefits of the project include:

- Reliable power: NSW households would have greater access to reliable and affordable electricity.
- Economic growth: HumeLink would unlock the full capacity of the expanded Snowy Hydro Scheme and enable greater sharing of energy across the eastern states.
- Cleaner, sustainable future: HumeLink would enable more renewable energy generation to enter the market, supporting Australia's emissions reduction targets.
- Jobs and opportunities: HumeLink would create more than 1,000 construction jobs.
- Economic growth: HumeLink would contribute to economic activity in regional NSW, generating major benefits for local communities along the route.

AEMO's final 2024 ISP is expected to take into account the updated costs of HumeLink as well as the updated costs and timings of other major developments in the NEM more widely, and the revised delivery timing for Snowy 2.0. Transgrid expect the analysis in the draft 2024 ISP to confirm that HumeLink continues to provide net benefits to the market and remains a key component of the ISP Optimal Development Path (ODP).

The net market benefits associated with HumeLink have increased, from $491 million to more than $1 billion (Transgrid, 2024a). This significant increase in market benefits is primarily driven by:

- the latest AEMO information on timing of energy generation projects, and
- emissions targets and renewable energy policies changing the inputs and assessments for AEMO benefits modelling.

Overall, the proposed amendments and refinements identified in this Amendment Report present the same key benefits as presented in the EIS. Chapter 3 (Description of the amended project) of this Amendment Report provides further discussion on the justification and benefits of each amendment and refinement of the amended project compared to the EIS project.

3. Description of the amended project

This chapter describes the proposed changes associated with the amended project, and provides a summary of amendments, refinements and clarifications that have been made to the project following public exhibition of the EIS. An updated project description, incorporating the proposed amendments, refinements and clarifications, is provided in Appendix A (Updated project description).

3.1. Overview of the proposed amendments and refinements

Transgrid has identified several proposed amendments and refinements to the project as described in the EIS. These amendments and refinements reflect functional improvements to the design and construction methodology of the project, and have been made in response to:

- feedback received from stakeholders prior to and during the public exhibition of the EIS
- comments made in formal submissions on the EIS
- ongoing design and construction methodology development by the construction contractors.

Transgrid's ongoing engagement activities during the development of this Amendment Report have provided communities and stakeholders opportunities to offer feedback on the proposed project amendments and refinements (refer to Chapter 5 (Engagement) and Appendix D (Engagement Outcomes Report)).

3.1.1. Amendments

The *State Significant Development Guidelines – Preparing an Amendment Report* (DPE, 2022a) (DPE Guidelines 2022) define an amendment as a change in what the applicant is seeking consent for, made during the assessment. Amendments to the project are being sought following the public exhibition of the EIS. Project amendments require changes to the project description in the EIS and amendments to the associated infrastructure application. Appendix A (Updated project description) details the proposed changes to the project description. The proposed amendments to the project include:

- changes to the transmission line corridor including the realignment of the route through Green Hills State Forest to the west of Batlow
- changes to the number and location of construction ancillary facilities including worker accommodation facilities and construction compounds
- nomination of access tracks to support the construction and operation of the project
- additional telecommunications connections to existing substations.

3.1.2. Refinements

The DPE Guidelines 2022 define a refinement as a change that fits within the limits set by the project description in the EIS and does not change what the applicant is seeking approval for, or require an amendment to the project. Refinements do not change what is being sought for approval or require an amendment to the infrastructure application for the project. For completeness, these refinements have been considered in this amendment report. The proposed refinements to the project include:

- transmission line and substation design refinements at Gregadoo
- identification of areas where controlled blasting may be required

- use of approved water sources
- use of helicopters and drones.

The project with all proposed amendments and refinements is referred to as the ‘amended project’. The project, as described and assessed in the EIS, is referred to as the ‘EIS project’.

Table 3-1 provides a summary of the changes between the EIS project and the amended project, with further detail provided in subsequent sections. An overview of the key components of the amended project is shown on Figure 1-2. The project description provided in Chapter 3 (Project description - infrastructure and operation) and Chapter 4 (Project description - construction) of the EIS have also been updated in consideration of the proposed amendments and refinements. A consolidated, detailed description of the amended project is provided in Appendix A (Updated project description). Assessments of the potential environmental impacts of the proposed amendments and refinements are provided in Chapter 6 (Assessment of impacts), and in the supporting technical reports. The construction contractors will continue to refine and confirm the design and construction methodology during detailed design and construction planning with the objective of further reducing potential impacts.

Table 3-1 Summary of the changes between the EIS project and amended project

Project element	Summary of the EIS project	Changes between the EIS project and the amended project	Reference
Infrastructure and operation			
Project footprint and location	The project footprint extends from the existing Wagga 330 kV substation in the west to the existing Bannaby 500 kV substation in the east and the future Maragle 500 kV substation in the south. The project footprint includes the indicative location of project infrastructure, the area that would be directly disturbed during construction and any easement required during operation. As such, the project footprint comprises all proposed infrastructure elements including the proposed transmission line structures, transmission line easements, new substation infrastructure, telecommunications hut and permanent access tracks. The final location of all proposed infrastructure would be confirmed during detailed design.	The amended project footprint continues to extend from the existing Wagga 330 kV substation in the west to the existing Bannaby 500 kV substation in the east and the future Maragle 500 kV substation in the south. However, the amended project footprint has changed in several locations, including as a result of: • changes to the transmission line corridor alignment (including the Green Hills corridor amendment) • changes to permanent access tracks proposed • changes to telecommunications connections including: - removal of the telecommunications hut at Killimicat - additional telecommunications connections to existing substations. The final location of all proposed infrastructure would be confirmed during detailed design.	Figure 3-1 Figure 3-2 Figure 3-5 Figure 3-6 Section 3.2 Section 3.4 Section 3.5

Project element	Summary of the EIS project	Changes between the EIS project and the amended project	Reference
Transmission line sections	The project includes the construction of new 500 kV transmission lines between: • Wagga 330 kV substation and proposed Gugaa 500 kV substation (approximately 11 km) • proposed Gugaa 500 kV substation and Wondalga (approximately 65 km) • Wondalga and future Maragle 500 kV substation (approximately 46 km) • Wondalga and Bannaby 500 kV substation (approximately 234 km). Note that the transmission line section between Wagga 330 kV substation and the proposed Gugaa 500 kV substation would operate at 330 kV under HumeLink. The project also includes the rebuild of approximately 2 km of Line 51 as a new double circuit 330 kV transmission line between the Wagga 330 kV substation and near Ivydale Road, Gregadoo. This would be adjacent to the new transmission line between the existing Wagga 330 kV and proposed Gugaa 500 kV substations.	The changes to the transmission line corridor have increased the length of the amended project from around 360 km to around 365 km, which comprises the following 500 kV transmission lines sections between: • Wagga 330 kV substation and the proposed Gugaa 500 kV substation (approximately 11 km) • proposed Gugaa 500 kV substation and Wondalga (approximately 61 km) • Wondalga and future Maragle 500 kV substation (approximately 54 km) • Wondalga and Bannaby 500 kV substation (approximately 239 km). While it is initially proposed to operate the transmission line section at Gregadoo between Wagga 330 kV substation and the proposed Gugaa 500 kV substation at 330 kV under HumeLink, the project has been refined to provide the capability for this section to operate at 500 kV in the future with the commissioning of the proposed Victoria to NSW Interconnector West (VNI West) project (which is subject to a separate planning approval). The amended project still includes the rebuild of approximately 2 km of Line 51.	Figure 3-1 Figure 3-2 Section 3.2 Section 3.6
Substation locations and work	The project includes the following substation work: • construction of a new 500/330 kV substation in Gregadoo, NSW, referred to as the proposed Gugaa 500 kV substation • modification of the existing 330/132 kV substation at Gregadoo, NSW, referred to as the Wagga 330 kV substation • modification of the existing 500/330 kV substation at Bannaby, NSW • connection of the new transmission lines to the future 500/330 kV substation at Maragle, NSW. Note that construction and operation of the future Maragle 500 kV substation will be carried out under the approved Snowy 2.0 Transmission Connection Project (SSI-9717).	The proposed substation work at the proposed Gugaa 500 kV substation at Gregadoo has been amended as a result of further design development for the proposed Victoria to NSW Interconnector West (VNI West) project integration and to allow the transmission line section between Wagga 330 kV substation and the proposed Gugaa 500 kV substation to be operated at 500 kV in the future. There are no proposed changes from the EIS project description to the other substation locations and work.	Figure 3-7 Section 3.6

Project element	Summary of the EIS project	Changes between the EIS project and the amended project	Reference
Operational ancillary development	The project includes the following operational ancillary development: • one optical repeater telecommunications hut located at Killimicat (about 10 km north-east of Tumut) • new and upgraded operational access tracks and roads (including waterway crossings where required).	Additional telecommunications connections between the transmission line corridor and existing Transgrid substations are proposed at three additional locations. These additional connections are to the Gadara 132 kV substation, Gullen Range 330 kV substation and Crookwell 2 330 kV substation. These telecommunications connections replace the telecommunications hut at Killimicat, which is no longer proposed in the amended project. There have also been changes to the location of permanent access tracks and roads (including waterway crossings where required) compared to the EIS project.	Figure 3-5 Figure 3-6 Section 3.4 Section 3.5
Operational maintenance and resource use	Regular maintenance activities would be required for the transmission lines and substations during operation. Likely maintenance activities would include: • regular inspection and maintenance of transmission lines and structures • ad hoc fault and emergency fly over(s) to assess infrastructure condition should an unplanned outage occur • vegetation management within the transmission line easement to maintain appropriate clearances between ground vegetation and transmission lines and management of trees outside of the easement which could pose a bushfire risk and/or risk to the transmission lines • ad hoc attendance (typically one to two times per month) at substations of one or two switching operators to undertake planned and unplanned switching of equipment • routine inspection and maintenance of substation infrastructure, property and switchyard areas. The operational water requirement for the project is anticipated to be approximately 116 kL/year.	No change.	Appendix A

Project element	Summary of the EIS project	Changes between the EIS project and the amended project	Reference
Property requirements	The project would acquire 80.70 ha of freehold land for the proposed Gugaa 500 kV substation and 0.04 ha of freehold land for the telecommunications hut located at Killimicat. A new transmission line easement would also be required for the project in addition to potential access easements to provide Transgrid operational staff with access from the nearest public road to the transmission line easement.	The area required to be acquired for the proposed Gugaa 500 kV substation has increased from 80.70 ha to 103.49 ha. 0.04 ha of freehold land is no longer required to be acquired due to the removal of the telecommunications hut located at Killimicat in the amended project.	Figure 3-7 Section 3.6
Commencement of operations	The project is expected to be operational by the end of 2026.	No change.	Appendix A
Operational workers	The project would require five full-time maintenance workers during operation (in addition to Transgrid's existing workers in the region).	No change.	Appendix A
Operational life	The design life of the project is 50 years, which can be extended to more than 70 years for some infrastructure components and plant items. Components would be replaced or refurbished towards the end of their serviceable life, allowing the service life to be maximised as far as possible.	No change.	Appendix A
Construction			
Project footprint	The project footprint extends from the existing Wagga 330 kV substation in the west to the existing Bannaby 500 kV substation in the east and the future Maragle 500 kV substation in the south. The project footprint includes the indicative location of project infrastructure, the area that would be directly disturbed during construction and any easement and permanent access tracks required during operation. As such, the project footprint includes the area of temporary construction disturbance, such as construction compounds, laydown areas, the worker accommodation facility, construction benches for transmission line structures, brake and winch sites, a concrete batching plant, temporary access tracks and waterway crossings. The final locations for these project elements would be confirmed by the construction contractors during detailed design.	The amended project footprint continues to extend from the existing Wagga 330 kV substation in the west to the existing Bannaby 500 kV substation in the east and the future Maragle 500 kV substation in the south. However, the amended project footprint has changed in several locations to include amendments associated with the construction of the project, including: • updates to construction ancillary facilities, including worker accommodation facilities and construction compounds • changes to temporary access tracks and roads and waterway crossings • changes to brake and winch sites and construction benches for transmission line structures.	Figure 3-3 Figure 3-4 Figure 3-5 Section 3.3 Section 3.4 Appendix A
Construction program	Construction is expected to commence in 2024 and take about 2.5 years to complete. The project is expected to be fully operational by the end of 2026.	No change.	Appendix A

Project element	Summary of the EIS project	Changes between the EIS project and the amended project	Reference
Construction workers	The number of construction workers would vary depending on the phase of construction and associated activities. During peak construction activities, the project is expected to employ up to 1,200 full-time equivalent workers across multiple work fronts.	The delivery method has been confirmed for the amended project and would see east and west sections constructed separately with an interface at Wondalga. Two principal construction contractors have been selected to deliver the amended project. As such, anticipated worker numbers have changed, and the project is now expected during peak construction activities to employ up to 1,600 full-time equivalent workers across multiple work fronts.	Appendix A
Ancillary development	The construction of the project would involve establishment and use of: • new and upgraded access tracks including connection to the existing road network as required • a temporary worker accommodation facility at Tumbarumba • 14 construction compounds nominated to support laydown areas, stockpiling areas, a concrete batching plant, site offices and parking • helipad/helicopter support facilities (within nominated construction compounds) • other minor storage and laydown ancillary areas along the transmission line route.	The amended project includes changes to the ancillary development that would be established and used during the construction of the project. This includes: • 11 construction compounds nominated to support laydown areas, stockpiling areas, concrete batching plants, site offices and parking (comprising 4 new construction compounds and removal of 7 construction compounds nominated as part of the EIS project) • 5 combined temporary worker accommodation facilities and construction compounds at Tarcutta, Adjungbilly, Yass, Crookwell and Green Hills • removal of the proposed temporary worker accommodation facility at Tumbarumba • new and upgraded access tracks/roads • revised helipad/helicopter support facilities (within the amended construction compounds).	Figure 3-3 Figure 3-4 Figure 3-5 Figure 3-8 Section 3.3 Section 3.4 Section 3.9 Appendix A
Construction water management	It is estimated that about 564 megalitres (ML) of water would be required for construction. This includes 498 ML of non-potable water and 66 ML of potable water. Non-potable water sources would include construction sedimentation basins, farm dams, rainwater tanks, groundwater bores and water purchased from existing water user allocations. Potable water sources would include council standpipes or connection to council water supply systems. The total annual volume of wastewater generated during construction is expected to be about 8.81 ML.	The amended project includes updated estimates to the water requirements for the construction of the project and the volume of wastewater generated as a result of further construction planning. It is estimated that about 715 ML of water would be required for the construction of the amended project. This includes 429 ML of non-potable water and 286 ML of potable water. The total daily volume of wastewater generated during construction is expected to be about 50 to 100 kL per worker accommodation facility. The potential sources of non-potable and potable water have not changed, but further analysis of water supply points has been carried out for the amended project. The water supply point analysis complements the analysis carried out for identifying water sources in the EIS.	Section 3.8 Appendix A

Project element	Summary of the EIS project	Changes between the EIS project and the amended project	Reference
Earthworks estimate	Earthworks for construction of transmission line structures and access tracks would involve an estimated 283,590 m^3 of cut and 115,690 m^3 of fill. Earthworks for substation construction would involve an estimated 382,440 m^3 of cut and 302,580 m^3 of fill. The area required for the construction of each transmission line structure would require access for assembly and stringing work. At a typical site, this would include a temporary area of up to 50 metres by 70 metres at each transmission line structure location. Construction of access tracks would generally require full vegetation clearing to a width of 10 metres.	Earthwork estimates have been updated for the amended project due to further design and construction methodology development by the construction contractors. Earthworks for the construction of transmission line structures and access tracks would involve an estimated 1,460,000 m^3 of cut and 1,720,000 m^3 of fill. Indictive earthwork volumes exclude topsoil strip. Many areas will require localised cut to fill operations which will be developed and optimised during further detailed design and construction planning and are not accounted for in the earthworks estimate. The indicative earthwork volumes are based on the assumption that cut material can be used as fill for the project. The increase in earthwork estimates for the construction of transmission line structures accounts for larger cut and fill volumes anticipated in areas of steep terrain. At a typical site, this would include a temporary area of up to 60 metres by 70 metres at each transmission line structure location. Larger construction benches of up to 70 metres by 100 metres may be required in steep terrain to allow for additional earthworks to make the area safe for working. The increase in earthwork estimates associated with the nomination of access tracks, including new and upgraded access tracks, accounts for the longer track extents to connect to the local road network and the larger cut and fill volumes anticipated in areas of steep terrain. Construction of new access tracks would generally require full vegetation clearing (with associated earthwork footprints) up to a width of 10 metres, with some limited areas, particularly in steep terrain, requiring a clearing width of up to 20 metres for batters (with associated earthwork footprints). The increase in earthwork estimates for the construction of transmission line structures and access tracks have been assessed as part of the amended project. Earthworks for substation construction would involve an estimated 105,000 m^3 of cut and 135,000 m^3 of fill. The decrease in earthwork estimates for the substation construction is primarily due to the substation design refinement at the proposed Gugaa 500 kV substation which has been assessed as part of the amended project.	Appendix A

Project element	Summary of the EIS project	Changes between the EIS project and the amended project	Reference
Construction access routes	Hume Highway, Sturt Highway, Snowy Mountains Highway, Batlow Road and Gocup Road are the main national and state roads proposed to provide access to the project footprint. Access would also be facilitated by the use of regional and local roads throughout the Local Government Areas (LGAs) of Wagga Wagga City, Snowy Valleys, Yass Valley, Cootamundra-Gundagai Regional and Upper Lachlan Shire that connect to the project footprint.	The revised access arrangements for the amended project would still generally utilise the same national and state roads identified for the EIS project. However, the extent of regional and local roads to be used has extended to the Goulburn Mulwaree and Hilltops LGAs for the amended project. Local connections to the local road network have also changed for the amended project.	Figure 3-5 Section 3.4

3.2. Changes to the transmission line corridor

3.2.1. Green Hills corridor amendment

3.2.1.1. EIS description

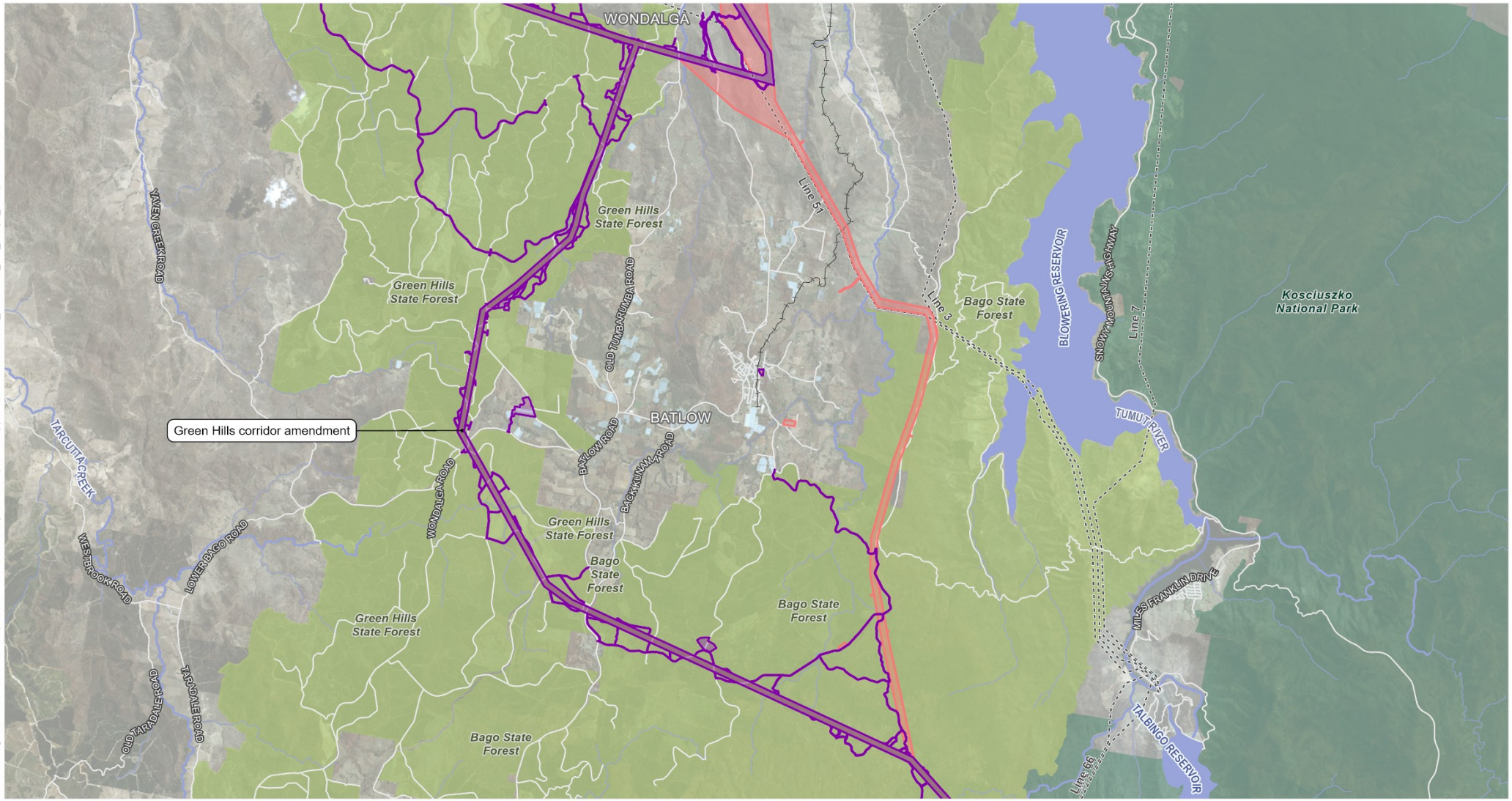
Section 3.3.1.3 of the EIS provided an overview of the transmission line corridor between Wondalga and the future Maragle 500 kV substation. The transmission line corridor generally ran in a south-south-east direction from Wondalga before connecting with the future Maragle 500 kV substation. The transmission line corridor alignment was located to the east of Batlow and traversed private property through Wondalga and Gilmore for around 11 kilometres before traversing Bago State Forest and connecting to the future Maragle 500 kV substation.

3.2.1.2. Amendment description

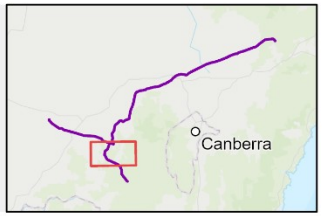
As discussed in Section 2.6.1 of the EIS, in 2023, members of the community proposed an alternative alignment for the transmission line corridor between Wondalga and the future Maragle 500 kV substation through the Green Hills State Forest. Following engagement with Forestry Corporation of NSW (FCNSW), landholders and regulators, this potential alternative route west of Batlow was considered further.

Following additional consultation with affected landowners prior to and during the exhibition of the EIS and further technical analysis and investigations, the alternate transmission line corridor option west of Batlow and through Green Hills State Forest (referred to as the Green Hills corridor amendment) was identified as the preferred option for the transmission line corridor between Wondalga and the future Maragle 500 kV substation.

With this realignment, the transmission line corridor would extend from the west of Wondalga Road and run in a southern direction along the eastern side of Green Hills State Forest for about 21 kilometres, then south-east for around 17.5 kilometres through Bago State Forest before joining the EIS project transmission line corridor near two existing 330 kV transmission lines (Line 64 and Line 66). The transmission line route would be located to the west and south of Batlow and crosses local roads and trails within Green Hills State Forest, Lower Bago Road, Batlow Road, Adelong Creek and Bago Creek. East of Wondalga Road, the transmission line would run south-east for around 4.5 kilometres before turning north. Figure 3-1 provides a comparison of the preferred western route through Green Hills State Forest and the EIS project.



Amended project footprint
EIS project footprint
National park and reserve
State forest
Waterbody
Waterway
Existing Transgrid transmission line
Railway



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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FIGURE 3-1: Green Hills corridor amendment

The Green Hills corridor amendment would provide the following advantages compared to the EIS project:

- supports an alternative transmission line corridor proposed by the local community
- aligns with NSW Government principles on placing transmission infrastructure on public land where feasible
- avoids private property impacts on landowners to the east of Batlow
- reduces landscape character and visual amenity impacts
- reduces the extent of impacts to native vegetation
- increases the distance away from the heritage listed Kosciuszko National Park for this section of the transmission line corridor
- provides opportunities to utilise established previously disturbed forestry tracks for construction and operation purposes resulting in greatly reduced earthworks and more efficient access.

3.2.2. Minor changes to the transmission line corridor

In addition to the Green Hills corridor amendment, nine minor changes to the transmission line corridor are proposed. The minor changes are in response to further engagement with easement affected landowners and design development since public exhibition of the EIS. These changes have facilitated a more prudent and efficient transmission line corridor design that considers concerns from easement affected landowners where practicable. These changes have generally led to reduced impacts, particularly with regards to Aboriginal cultural heritage, agriculture and land use and property, as described in Table 3-2.

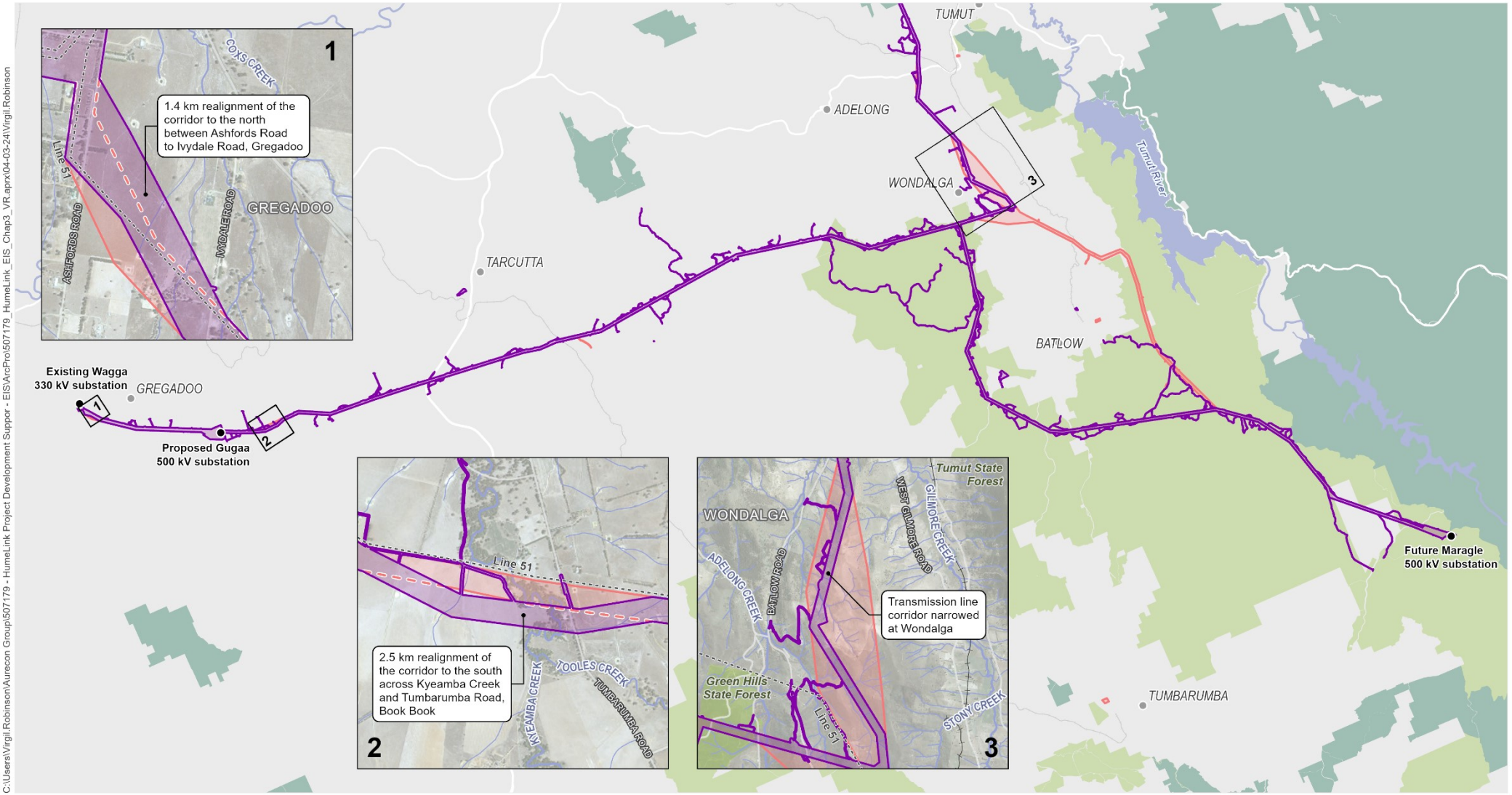
Table 3-2 provides a description of the proposed minor changes to the transmission line corridor and associated EIS project descriptions. Figure 3-2 provides a comparison of these changes and the EIS project.

Table 3-2 Description of the proposed minor changes to the transmission line corridor

General location	EIS description	Amendment description
(1) Between Ashfords Road and Ivydale Road, Gregadoo	From the existing Wagga 330 kV substation, the transmission line corridor extended south for about 750 m before crossing Ashfords Road and traversing private properties for 1.2 km until crossing Ivydale Road. The alignment of the transmission line corridor through the private properties included a slight direction change.	Following engagement with the affected landowners and subsequent supporting technical and environmental assessment to determine feasibility, a 1.4 km realignment of the transmission line corridor to the north is proposed between Ashfords Road to Ivydale Road. The transmission line corridor extends about 500 m south from the existing Wagga 330 kV substation before traversing the private property between Ashfords Road and Ivydale Road and joining the EIS project transmission line corridor. The amendment also removes a slight direction change in the transmission line corridor alignment
(2) Between Byes Lane and Tumbarumba Road, Book Book	From Byes Lane, the transmission line corridor extended east parallel to existing Line 51 through private properties and crossing an extensive section of Kyeamba Creek and its associated riparian corridor and Tumbarumba Road.	Following engagement with the affected landowners and subsequent supporting technical and environmental assessment to determine feasibility, a 2.5 km realignment of the transmission line corridor is proposed between Byes Lane to the south across Kyeamba Creek and Tumbarumba Road. The transmission line corridor slightly deviates south from the existing Line 51 alignment at Byes Lane before crossing Kyeamba Creek and Tumbarumba Road. After crossing Tumbarumba Road, the transmission line corridor then deviates north to join the EIS project transmission line corridor. The minor change to the transmission line corridor at this location reduces the potential impact on Kyeamba Creek and its associated riparian corridor.
(3) Wondalga	The project footprint at Wondalga included a widened transmission line corridor (up to 1.5 km wide) due to design uncertainty at this location.	Following technical and environmental assessment to determine feasibility and investigation of the Green Hills corridor amendment, the transmission line corridor at Wondalga has been narrowed to the typical 200 m width used elsewhere for the project. The amended transmission line corridor remains within the EIS project transmission line corridor. The reduction to the transmission line corridor at this location provides more certainty for the affected landowners as to where the final transmission line corridor will be located.
(4) Snowy Mountains Highway, Gadara	The transmission line corridor crossing of the Snowy Mountains Highway included a straight 4 km alignment (around 2 km on either side of the highway). The transmission line corridor traversed private properties at this location, generally in a north-south direction.	Following engagement with the affected landowner and subsequent supporting technical and environmental assessment to determine feasibility, a 2.7 km realignment of the transmission line corridor to the east near Snowy Mountains Highway is proposed. The transmission line corridor slightly deviates east around 2 km south of Snowy Mountains Highway for about 1.5 km before deviating west to rejoin the EIS project transmission line corridor about 700 m north of Snowy Mountains Highway.

General location	EIS description	Amendment description
(5) East of Minjary National Park, Gocup	From the south, the transmission line corridor extended through private property adjacent to the eastern boundary of Minjary National Park for about 2.2 km before deviating north-east towards Gocup Road.	Following further design development, construction planning and, technical and environmental assessment to determine feasibility, a 1.4 km realignment of the transmission line corridor is proposed to the east of Minjary National Park. From the south, the transmission line corridor extends for 1.4 km adjacent to the eastern boundary of Minjary National Park before deviating north-east for another 1.4 km before joining the EIS project transmission line corridor. The minor change to the transmission line corridor at this location reduces the extent of work adjacent to Minjary National Park.
(6) Between Tumut River and Killimicat Creek, Killimicat	From the crossing of Tumut River, the transmission line corridor extended north for about 800 m before deviating north-east for 2.2 km, crossing Brungle Road and heading south-east for 3 km. From this point, the transmission line corridor ran north-east and crossed Killimicat Creek.	Following engagement with the affected landowners, further design development and subsequent supporting technical and environmental assessment to determine feasibility, a 5.9 km realignment of the transmission line corridor is proposed from the north of the crossing of Tumut River to the south of the crossing of Killimicat Creek, Killimicat. The minor change to the transmission line corridor at this location generally follows the EIS project transmission line corridor alignment. However, it includes a minor 50 m shift to the north for 2.1 km, where the corridor alignment deviates to the north-east and a 2.6 km shift to the south from Brungle Road to before the crossing of Killimicat Creek. This location also includes the removal of the proposed telecommunications hut at Killimicat from the project footprint (refer to Section 3.5 for further detail).
(7) Gobarralong	The project footprint at Gobarralong included a widened transmission line corridor (up to 350 m wide) due to design uncertainty at this location.	Following engagement with the affected landowner, further design development, and subsequent supporting technical and environmental assessment to determine feasibility, the transmission line corridor at Gobarralong has been narrowed to the typical 200 m width used elsewhere for the project. The amended transmission line corridor remains within the EIS project transmission line corridor. The reduction to the transmission line corridor at this location provides more certainty for the affected landowner as to where the final transmission line corridor will be located.
(8) Bowning	The project footprint at Bowning included a widened transmission line corridor (up to 460 m wide) due to design uncertainty at this location.	Following engagement with the affected landowner, further design development and subsequent supporting technical and environmental assessment to determine feasibility, the transmission line corridor at Bowning has been narrowed to the typical 200 m width used elsewhere for the project. The amended transmission line corridor remains within the EIS project transmission line corridor. The transmission line alignment at this location was refined to avoid a waterfall and potential culturally significant site (Derringullen Creek Women's Site, refer to Section 6.3 for further details).

General location	EIS description	Amendment description
(9) West of Crookwell Road/Goulburn Road at Bannister	From the south, the transmission line corridor extended in a north-east direction and generally paralleled an existing 330 kV transmission line (Line 3H). At about 2.7 km west of Crookwell Road/Goulburn Road, the transmission line corridor deviated from paralleling Line 3H on its northern side to be located on its southern side as it crossed Crookwell Road/Goulburn Road.	Following further design development, which resulted in a reduction in transmission line structures, and subsequent supporting technical and environmental assessment to determine feasibility, a 0.4 km realignment of the transmission line corridor to the north is proposed. The realignment occurs at the location where the transmission line corridor deviates from paralleling Line 3H on its northern side to be located on its southern side.



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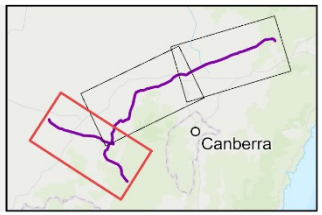
Amended project footprint
EIS project footprint
Existing Transgrid transmission line
National park and reserve
State forest
Waterbody
Waterway
Major road
Railway
Substation



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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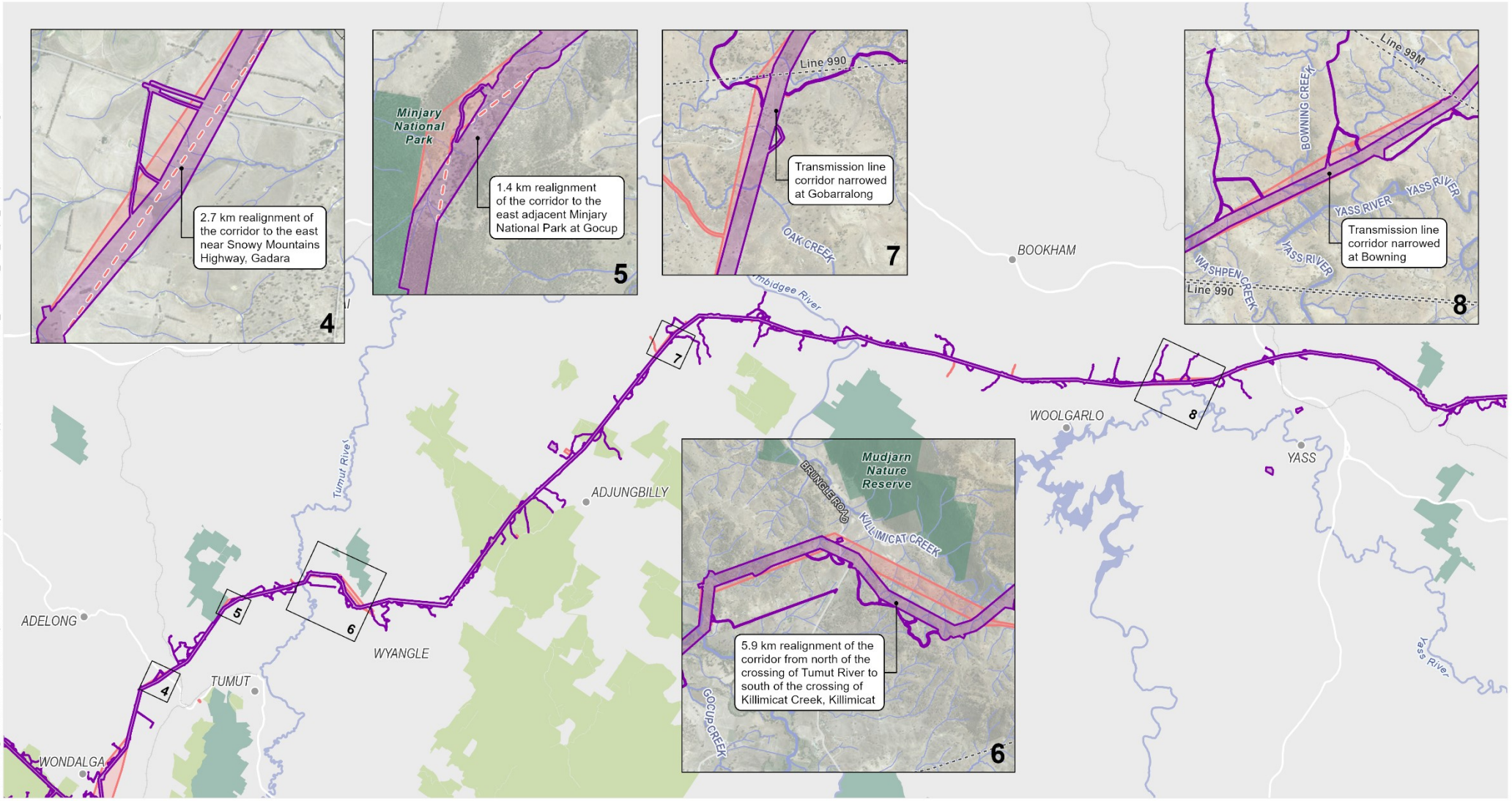
FIGURE 3-2a: Minor changes to transmission line corridor



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Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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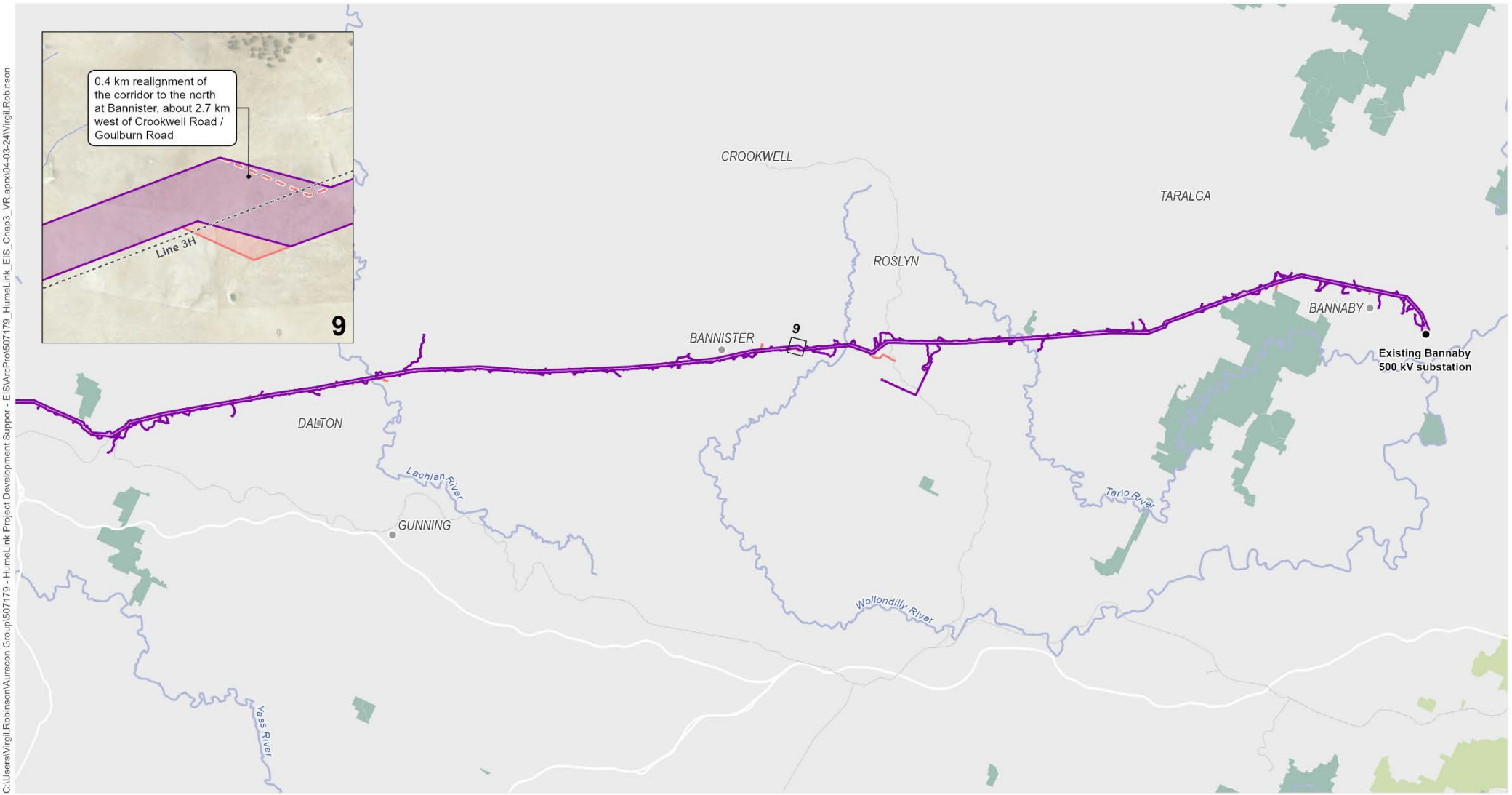
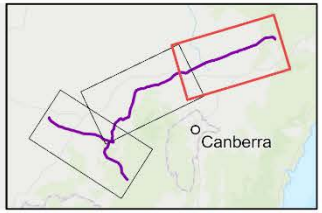
FIGURE 3-2b: Minor changes to transmission line corridor



Amended project footprint
EIS project footprint
Existing Transgrid transmission line
National park and reserve
State forest
Waterway
Major road
Railway
Substation



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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FIGURE 3-2c: Minor changes to transmission line corridor

3.3. Updates to construction ancillary facilities

3.3.1. Changes to worker accommodation facilities

3.3.1.1. EIS description

Section 4.3.3 of the EIS described the temporary worker accommodation facility on the corner of Courabyra Road and Alfred Street, Tumbarumba (Tumbarumba accommodation facility (AC1)) as a potential option to accommodate about 200 construction workers during construction of the project. Figure 4-8 of the EIS showed the location of the Tumbarumba accommodation facility (AC1). However, due to a potential accommodation shortage across the project footprint, Section 4.3.3 of the EIS also described that the ultimate delivery of the project may include multiple temporary worker accommodation facilities in various forms subject to further consultation.

3.3.1.2. Amendment description

On further consideration of the location of the Tumbarumba accommodation facility (AC1), it was determined that this location was not suitable to facilitate the construction program, mainly due to its distance from other parts of the project footprint, which would lead to longer travel times for workers and lost productivity. The Tumbarumba accommodation facility (AC1) is, therefore, no longer proposed in the amended project. Transgrid has had ongoing engagement with Snowy Valleys Council on the Tumbarumba accommodation facility (AC01) and the decision that it is no longer proposed.

However, in responding to stakeholder and community feedback on the likely shortage in existing available accommodation for workers in nearby towns and following further construction planning, changes have been proposed to the approach to temporary worker accommodation facilities for the project. Five new worker accommodation facilities are proposed as part of the amended project in Tarcutta, Adjungbilly, Yass, Crookwell and Green Hills.

The establishment of new temporary worker accommodation facilities for the project would assist in alleviating the pressure on short-term accommodation in nearby towns for tourists, the rental market and housing affordability. In addition to providing accommodation for construction workers, each worker accommodation facility would also include food and catering facilities, fitness and recreational facilities (such as a gymnasium), parking spaces and first aid facilities.

The locations of the proposed worker accommodation facilities have been strategically chosen to be closer to the amended project footprint to allow efficient access to the work sites during construction, thereby minimising travel time and worker fatigue from driving longer distances.

In addition, the Worker Accommodation Strategy proposed as mitigation measure SO1 in the EIS is no longer required. The purpose of the Worker Accommodation Strategy was to identify additional worker accommodation facility options. Transgrid has identified five new worker accommodation facilities proposed as part of the amended project. As such, mitigation measure SO1 is no longer required (refer to Appendix B (Updated mitigation measures)).

The proposed worker accommodation facilities would be co-located with construction compounds, which may include crushing and screening plants, concrete batching plants, helipad/helicopter facilities, generators, areas for laydowns, stockpiling and equipment storage, demountable offices, maintenance sheds, and chemical and fuel stores. Section 3.9 provides further details on helipad/helicopter facilities. Any new or changed worker accommodation facility would be subject to additional environmental

assessment in accordance with the process described in Chapter 26 (Environmental management), as required.

The new temporary worker accommodation facilities and construction compounds are described in Table 3-3 and shown in Figure 3-3. Further detail is provided in Appendix A (Updated project description).

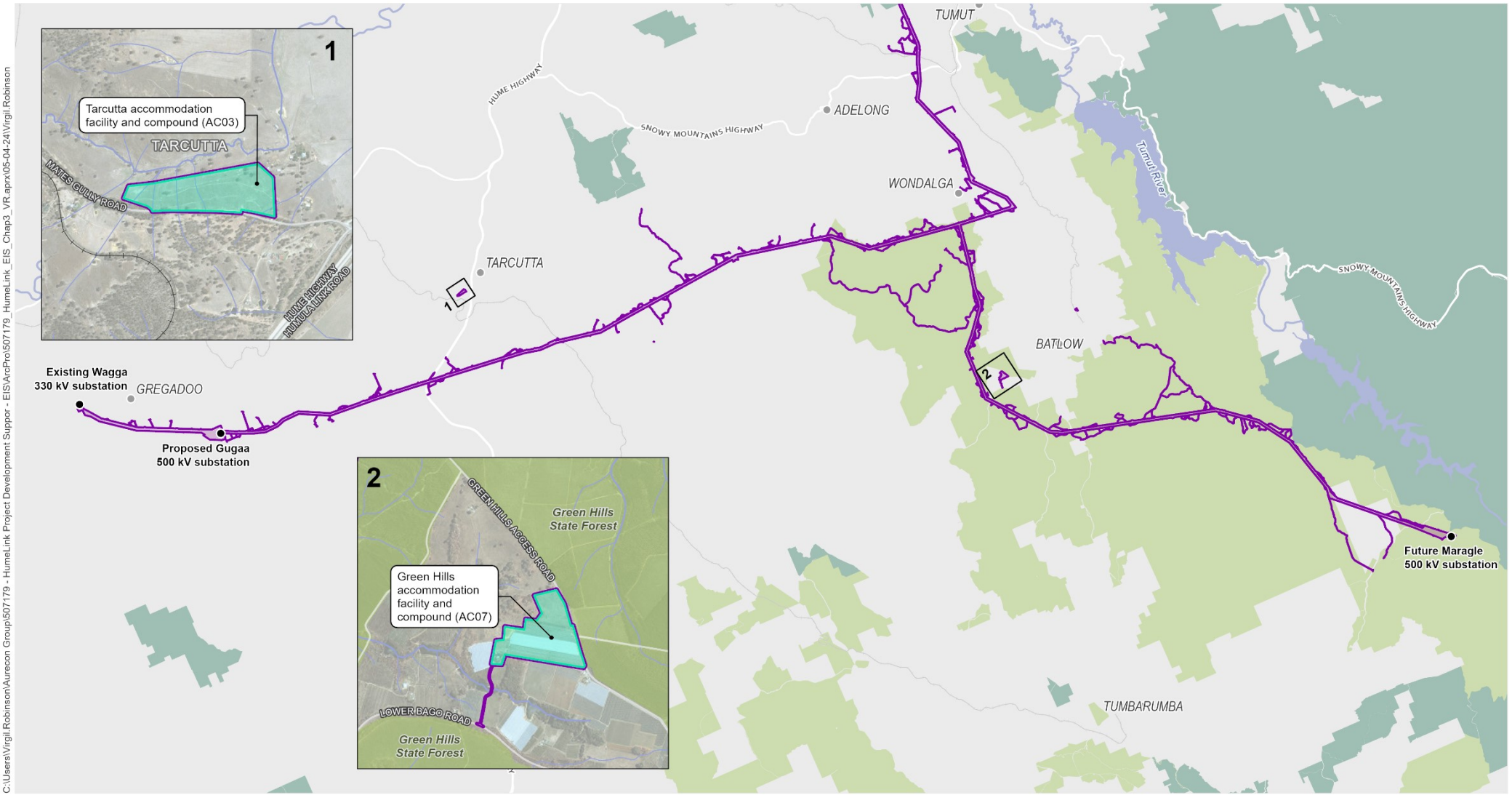
Table 3-3 New temporary worker accommodation facilities

Location	Description[1]
Tarcutta accommodation facility and compound (AC03)	The Tarcutta accommodation facility and compound (AC03) is located on private property along Mates Gully Road, Tarcutta, about 1.5 km south-west of Tarcutta, within the Wagga Wagga City LGA. The accommodation facility and compound would occupy land sloping towards the north, which is used for agriculture and primary production. An area of 13.48 ha has been assessed for the accommodation facility and compound, of which approximately 13 ha is expected to be utilised. A few rural residential properties are located near the accommodation facility and compound, with the closest residence about 170 m east on Mates Gully Road. Five unnamed drainage lines intersect the accommodation facility and compound boundary. Access to the accommodation facility and compound would be via the construction of a new access track from Mates Gully Road. The facility would accommodate up to 520 workers with full accommodation capacity likely to be reached during peak construction (ie for approximately three to five months). Parking for about 200 light vehicles, 10 mini-buses and 50 heavy vehicles would also be provided within the facility. At the completion of works the site would be rehabilitated in consultation with the landowner.
Adjungbilly accommodation facility and compound (AC04)	The Adjungbilly accommodation facility and compound (AC04) is located on private property along Adjungbilly Road, Adjungbilly, about 21.7 km east of Gundagai, within the Cootamundra-Gundagai Regional LGA. The accommodation facility and compound would occupy undulating land, mainly used for agriculture and primary production purposes. An area of 33.22 ha has been assessed for the accommodation facility and compound, of which approximately 10 ha is expected to be utilised. The closest residence is located about 205 m west of the accommodation facility and compound boundary on Adjungbilly Road, Adjungbilly. Drainage lines from Gatleys Creek intersect the accommodation facility and compound boundary, and a large farm dam is located within the western portion of the site. Access to the accommodation facility and compound would be via existing property access from Adjungbilly Road. The facility would accommodate up to 300 workers with full accommodation capacity likely to be reached during peak construction (ie for approximately three to five months). Parking for about 125 light vehicles and 25 heavy vehicles would also be provided within the facility. At the completion of works the site would be rehabilitated in consultation with the landowner.
Yass accommodation facility and compound (AC05)	The Yass accommodation facility and compound (AC05) is located on private property along Faulder Avenue on the north-western outskirts of the Yass township, in the Yass Valley LGA. The accommodation facility and compound would occupy land that slopes west towards Bango Creek, consisting of land used for agricultural and industrial purposes. An area of 11.09 ha has been assessed for the accommodation facility and compound, of which approximately 10 ha is expected to be utilised. The closest residence is located about 120 m south-west of the accommodation facility and compound on Yass Valley Way. The nearest waterway is Bango Creek located within 25 m of the western boundary. Access to the accommodation facility and compound would be via existing property access along Faulder Avenue. The facility would accommodate up to 300 workers with full accommodation capacity likely to be reached during peak construction (ie for approximately three to five months). Parking for about 125 light vehicles and 25 heavy vehicles would also be provided within the facility. At the completion of works the site would be rehabilitated in consultation with the landowner.

Location	Description[1]
Crookwell accommodation facility and compound (AC06)	The Crookwell accommodation facility and compound (AC06) is located on private property off Graywood Siding Road, Woodhouselee, about 18.1 km north of Goulburn, in the Upper Lachlan Shire LGA. The accommodation facility and compound would occupy undulating land, consisting of land used for agricultural purposes and also partially consisting of land that has been previously disturbed. This previously disturbed land is currently in use as a construction compound, as part of the construction of the Crookwell 3 Wind Farm (SSD-6695), however will be rehabilitated to its former agricultural land use at the completion of works. An area of 21.71 ha has been assessed for the accommodation facility and compound, of which approximately 6 ha is expected to be utilised. The closest residence is located about 2.1 km west of the accommodation facility and compound on Woodhouselee Road, Woodhouselee. Several unnamed drainage lines of Steeves Creek run through the accommodation facility and compound. A large farm dam is also located within the boundary. Access to the accommodation facility and compound would be via Graywood Siding Road. The facility would accommodate up to 300 workers with full accommodation capacity likely to be reached during peak construction (ie for approximately three to five months). Parking for about 125 light vehicles and 25 heavy vehicles would also be provided within the facility. At the completion of works the site would be rehabilitated in consultation with the landowner.
Green Hills accommodation facility and compound (AC07)	The Green Hills accommodation facility and compound (AC07) is located on private property along Green Hills Access Road, Kunama, located about 6.5 km west of Batlow, within the Snowy Valleys LGA. The accommodation facility and compound would occupy undulating land, which is used for agricultural purposes. An existing residential building is located within the boundary and would potentially be incorporated and used as part of the accommodation facility and compound. An area of 25.49 ha has been assessed for the accommodation facility and compound, of which approximately 15 ha is expected to be utilised. The closest residence is located about 120 m south of the accommodation facility and compound on Green Hills Access Road. Several unnamed drainage lines and farm dams are located near the accommodation facility and compound, the closest about 140 m south of the boundary. The drainage lines run to Yaven Yaven Creek, which is located about 2.1 km north-west of the accommodation facility and compound. One large farm dam is also located within the boundary of the accommodation facility and compound. Access to the accommodation facility and compound would be via existing property access off Green Hills Access Road. The accommodation facility would accommodate up to 420 workers with full accommodation capacity likely to be reached during peak construction (ie for approximately three to five months). Parking for about 200 light vehicles, 10 mini-buses and 50 heavy vehicles would also be provided within the facility. At the completion of works the site would be rehabilitated in consultation with the landowner.

Note:

1. The total area of the accommodation facility and compound within the amended project footprint may not be utilised, and there would be an opportunity for vegetation retention and/or existing land uses to be continued in areas not required for the accommodation facility and compound, eg grazing, subject to agreement with the landowner.



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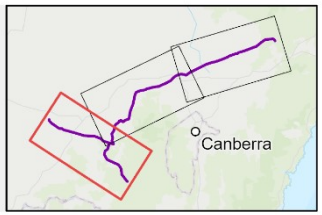
Amended project footprint
Combined worker accommodation facility and construction compound
National park and reserve
State forest
Waterbody
Waterway
Major road
Railway
Substation



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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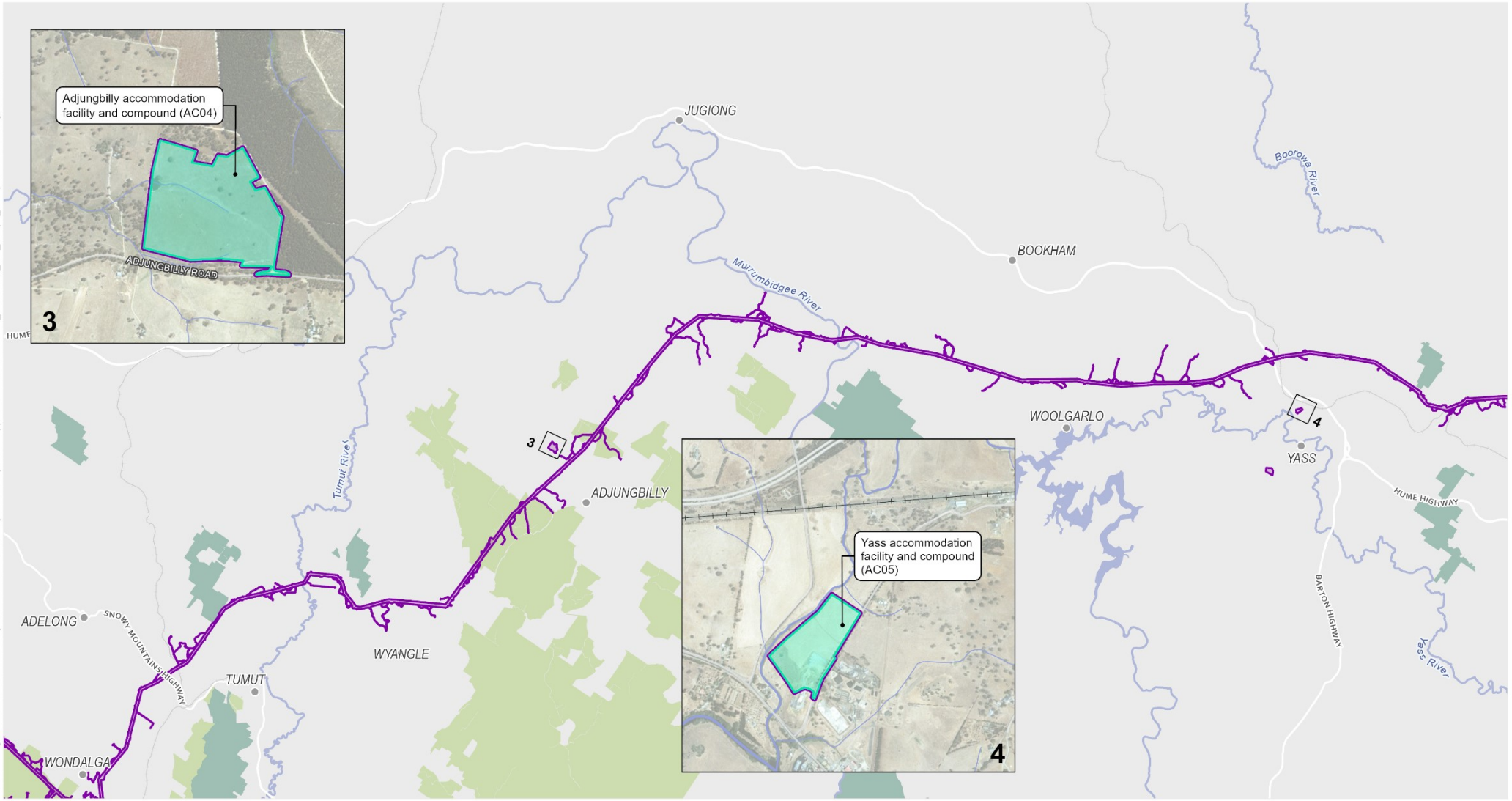
FIGURE 3-3a: Changes to worker accommodation facilities



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Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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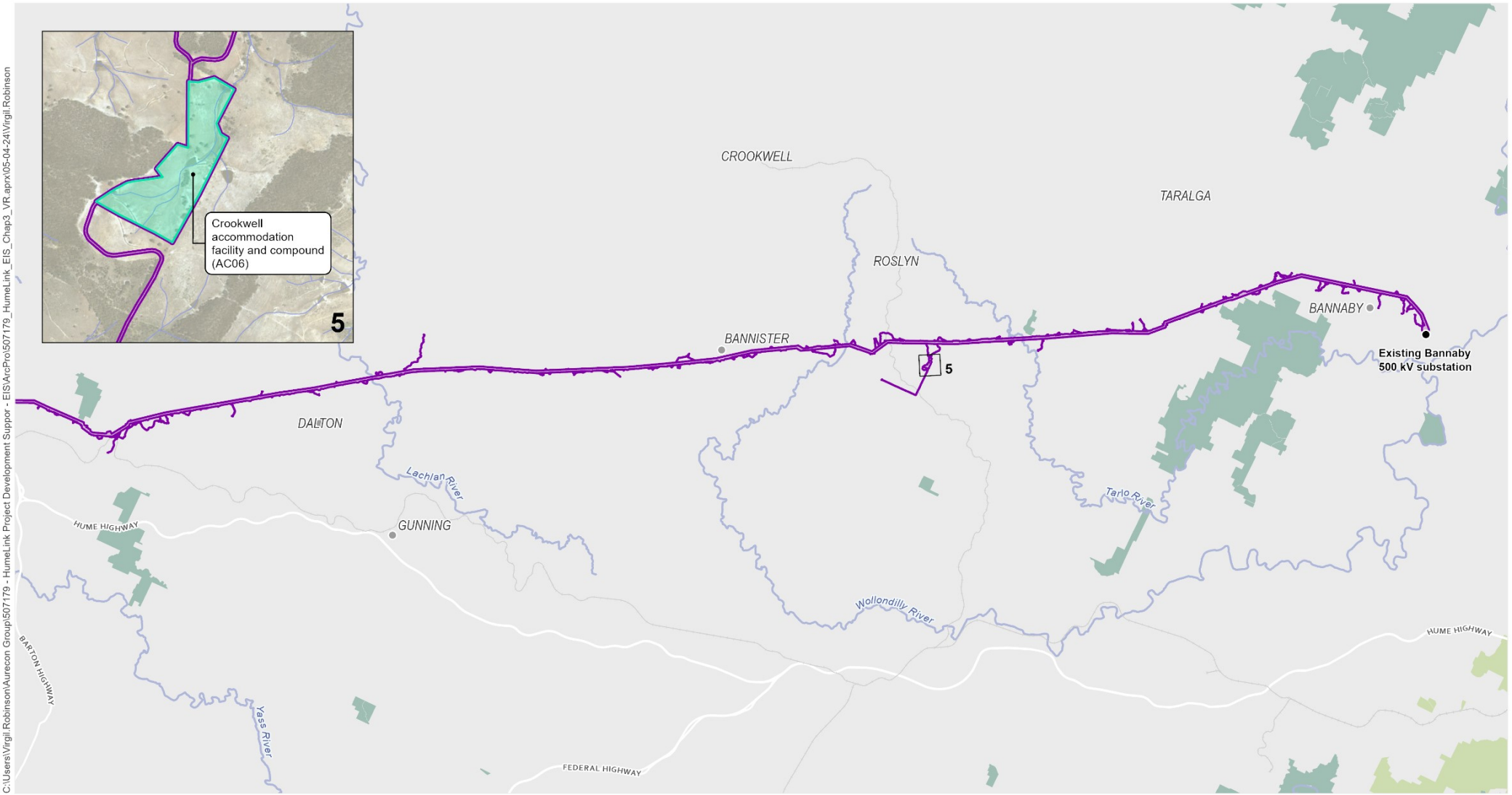
FIGURE 3-3b: Changes to worker accommodation facilities



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Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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FIGURE 3-3c: Changes to worker accommodation facilities

3.3.2. Changes to construction compounds

3.3.2.1. EIS description

Section 4.3.1 of the EIS described 14 potential construction compounds short-listed for consideration as part of the EIS. The 14 potential construction compound sites were located in Gregadoo, Gilmore, Red Hill, Adjungbilly, Yass, Woodhouselee, Bannaby, Batlow and Nurenmerenmong. The proposed use of the construction compounds, the boundaries, and the layout were to be refined as the project design was developed in consultation with relevant stakeholders and the construction contractors. Section 4.3.1 of the EIS also described that depending on the construction phasing and methodology, the construction contractors may elect not to use all nominated potential construction compounds.

3.3.2.2. Amendment description

Following further construction planning and consultation with affected landowners, a number of changes are proposed to the potential construction compounds considered in the EIS. Eleven standalone construction compounds are proposed for the amended project.

Seven of the 14 construction compounds are no longer required for the delivery of the project, including:

- Snowy Mountains Highway compound (C02)
- Snubba Road compound (C03)
- Red Hill Road compound (C08)
- Adjungbilly Road compound (C09)
- Woodhouselee Road compound (C11)
- Bowmans Lane compound (C15)
- Snubba Road compound (C16).

These have been replaced with the following compounds:

- Ardrossan Headquarters Road compound (C17)
- Snubba Road compound (C18)
- Gadara Road compound (C19)
- Ellerslie Road compound (C21).

Adjungbilly Road compound (C09) and Woodhouselee Road compound (C11) have been replaced by Adjungbilly accommodation facility and compound (AC04) and Crookwell accommodation facility and compound (AC06), respectively. These combined worker accommodation facilities and construction compounds are described in Table 3-3.

Gregadoo Road compound (C06), Honeysuckle Road compound (C07), Bannaby 500 kV substation compound (C12) and Memorial Avenue compound (C14) have also been amended based on further construction planning, which has resulted in changes to the project footprint at these locations. No changes are proposed to the Wagga 330 kV substation compound (C01), Maragle 500 kV substation compound (C05) or Yass substation compound (C10).

Table 3-4 provides a consolidated list and description of the standalone construction compounds. Further detail is provided in Appendix A (Updated project description). Figure 3-4 shows the locations of the changed standalone construction compounds.

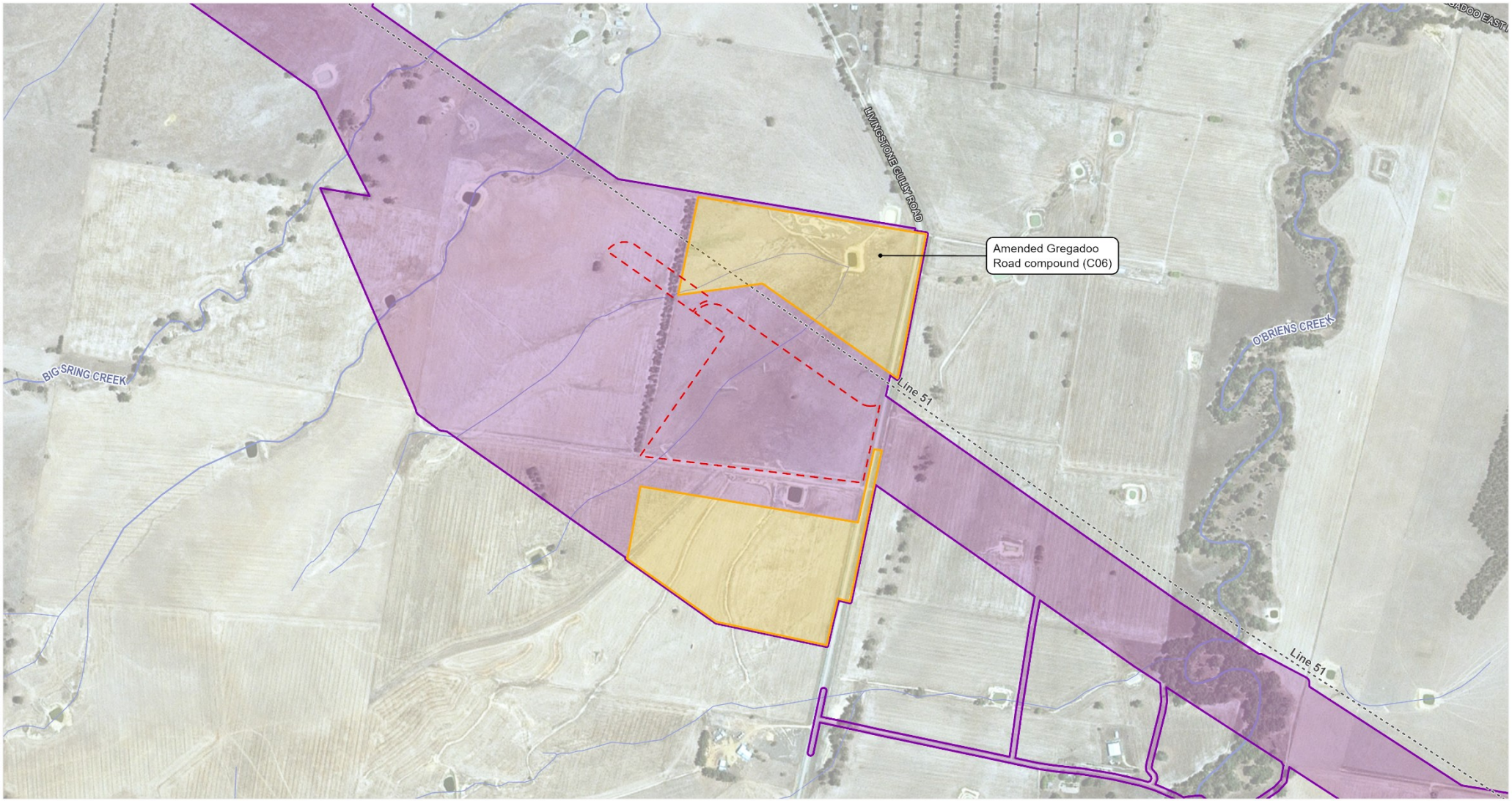
Table 3-4 Proposed construction compounds in the amended project

Location	Description[1]
Wagga 330 kV substation compound (C01)	No change is proposed compared to the EIS project.
Maragle 500 kV substation compound (C05)	No change is proposed compared to the EIS project.
Amended Gregadoo Road compound (C06)	The Amended Gregadoo Road compound (C06) location has been revised to account for the refinement of the proposed Gugaa 500 kV substation (refer to Section 3.6). An area of 32.11 ha has been assessed for the amended compound, of which approximately 8 ha is expected to be utilised. The area expected to be utilised for the amended project is a reduction in size compared to the EIS project, which required 16.40 ha.
Amended Honeysuckle Road compound (C07)	The Amended Honeysuckle Road compound (C07) area has increased to 14.92 ha compared to 8.20 ha for the EIS project. The increase in size optimises the land available and accounts for the removal of Red Hill Road compound (C08), the site area for which was approximately 2.59 ha, and Adjungbilly Road compound (C09), which was approximately 12.09 ha, proposed as part of the EIS. A concrete batching plant is also proposed to be included as part of the amended construction compound facilities.
Yass substation compound (C10)	No change is proposed compared to the EIS project.
Amended Bannaby 500 kV substation compound (C12)	The Amended Bannaby 500 kV substation compound (C12) has been adjusted to optimise the land available. An area of 9.61 ha has been assessed for the amended compound, of which approximately 4 ha is expected to be utilised. The area expected to be utilised for the amended project is an increase in size compared to the EIS project, which required 2.75 ha.
Amended Memorial Avenue compound (C14)	The Amended Memorial Avenue compound (C14) area has increased to 2.09 ha compared to 2.03 ha for the EIS project. The minor increase in size is to include the existing access point at this location.
Ardrossan Headquarters Road compound (C17)	The Ardrossan Headquarters Road compound (C17) is an additional construction compound proposed to support transmission line construction. The proposed construction compound is located on land owned by FCNSW in the Snowy Valleys LGA at Ardrossan Headquarters Road, Green Hills, about 7.6 km west of Batlow. The construction compound would occupy cleared land, which surrounds buildings, including the FCNSW Ardrossan Depot facility. An area of 7.07 ha has been assessed for the proposed compound, of which approximately 7 ha is expected to be utilised. The closest residence is about 30 m south of the construction compound boundary, being a building owned by FCNSW and providing seasonal FCNSW helicopter pilot accommodation. An associated helipad is located within the southern section of the construction compound. Use of these facilities is typically limited to the summer months. The next closest residences are about 1,000 m south-east of the construction compound. The nearest waterway to the construction compound is Germans Creek, located about 85 m to the east of the construction compound boundary. Access to the construction compound would be via the existing property access off Ardrossan Headquarters Road and Back Camp Road. A concrete batching plant is proposed to be included as part of the construction compound facilities.

Location	Description[1]
Snubba Road compound (C18)	The Snubba Road compound (C18) is an additional construction compound proposed to support transmission line construction and replaces Snubba Road compound (C03) from the EIS. The proposed construction compound is located in the Snowy Valleys LGA adjacent Bago Forest Way and Kopsens Road, Batlow, about 7.7 km south of the Batlow town centre. The construction compound would occupy land within Bago State Forest, which has been previously harvested and remains cleared. An area of 16.25 ha has been assessed for the proposed compound, of which approximately 13 ha is expected to be utilised. There are no nearby sensitive receivers. The nearest waterway to the construction compound is a drainage line of Wild Duck Gully located about 48 m east of the boundary. Access to the construction compound would be via the existing property access off Kopsens Road. A concrete batching plant is proposed to be included as part of the construction compound facilities.
Gadara Road compound (C19)	The Gadara Road compound (C19) is an additional construction compound proposed to support transmission line construction. The proposed construction compound is located on private property in the Snowy Valleys LGA along Gadara Road, Gadara, about 4.9 km west of Tumut. The construction compound would occupy an area of 5.26 ha on land used for agriculture and primary production purposes. The closest sensitive receiver is about 686 m west of the construction compound on Gadara Road, Gadara. This sensitive receiver property is owned by the same private property which leases the Gadara Road compound (C19). An unnamed drainage line of Sandy Creek is located within the boundary of the construction compound. A large farm dam is located adjacent to the western edge of the construction compound boundary. Access to the construction compound would be via existing property access along Gadara Road.
Ellerslie Road compound (C21)	The Ellerslie Road compound (C21) is an additional construction compound proposed to support transmission line construction. The proposed construction compound is located on private property in the Snowy Valleys LGA adjacent to Ellerslie Road and Yaven Creek Road, Ellerslie, about 13.1 km south-west of Adelong. The construction compound would occupy land used for agriculture and primary production purposes. An area of 10.41 ha has been assessed for the proposed compound, of which approximately 10 ha is expected to be utilised. The closest residence is located about 970 m north-east of the construction compound on Yaven Creek Road. An existing residential building is located within the boundary and would be incorporated and used as part of the construction compound. An unnamed drainage line of Yaven Yaven Creek intersects the northern border of the construction compound boundary. A farm dam is also partially located within the north-western section of the construction compound boundary. Access to the construction compound would be via existing property access along Ellerslie Road.

Note:

1. The total area of the construction compound within the amended project footprint may not be utilised, and there would be an opportunity for vegetation retention and/or existing land uses to be continued in the areas not required for the construction compound, eg grazing, subject to agreement with the landowner.



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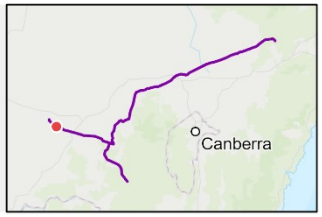
Amended project footprint

Construction compound site

Gregadoo Road compound (C06) as shown in EIS

Existing Transgrid transmission line

Waterway



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

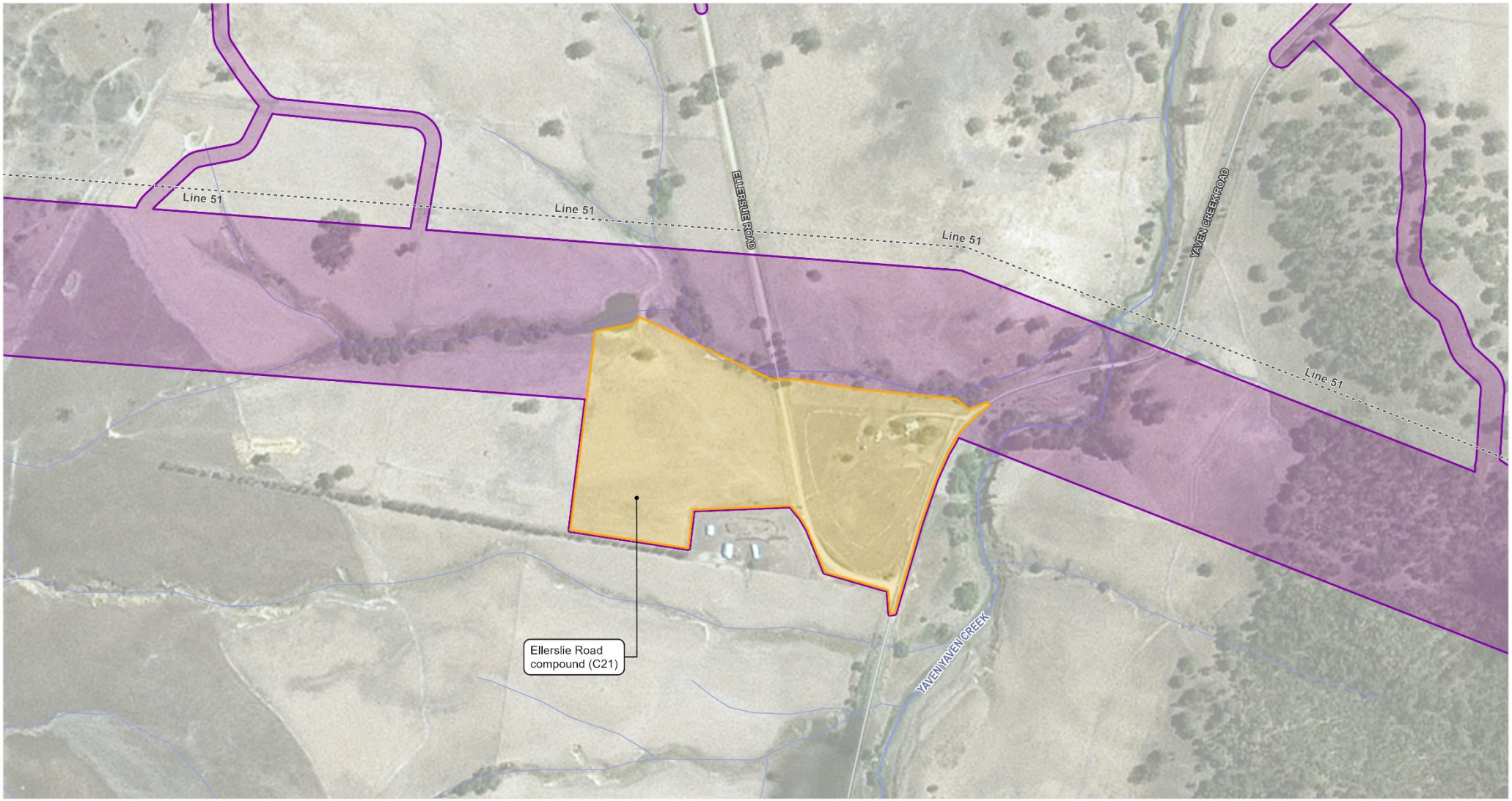
1:10,000

0 0.2 0.4 km

Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 3-4a: Changes to construction compounds



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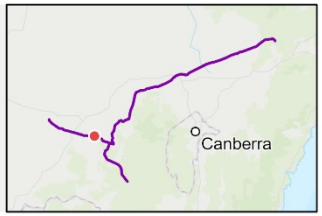
Amended project footprint

Construction compound site

Existing Transgrid transmission line

Waterway



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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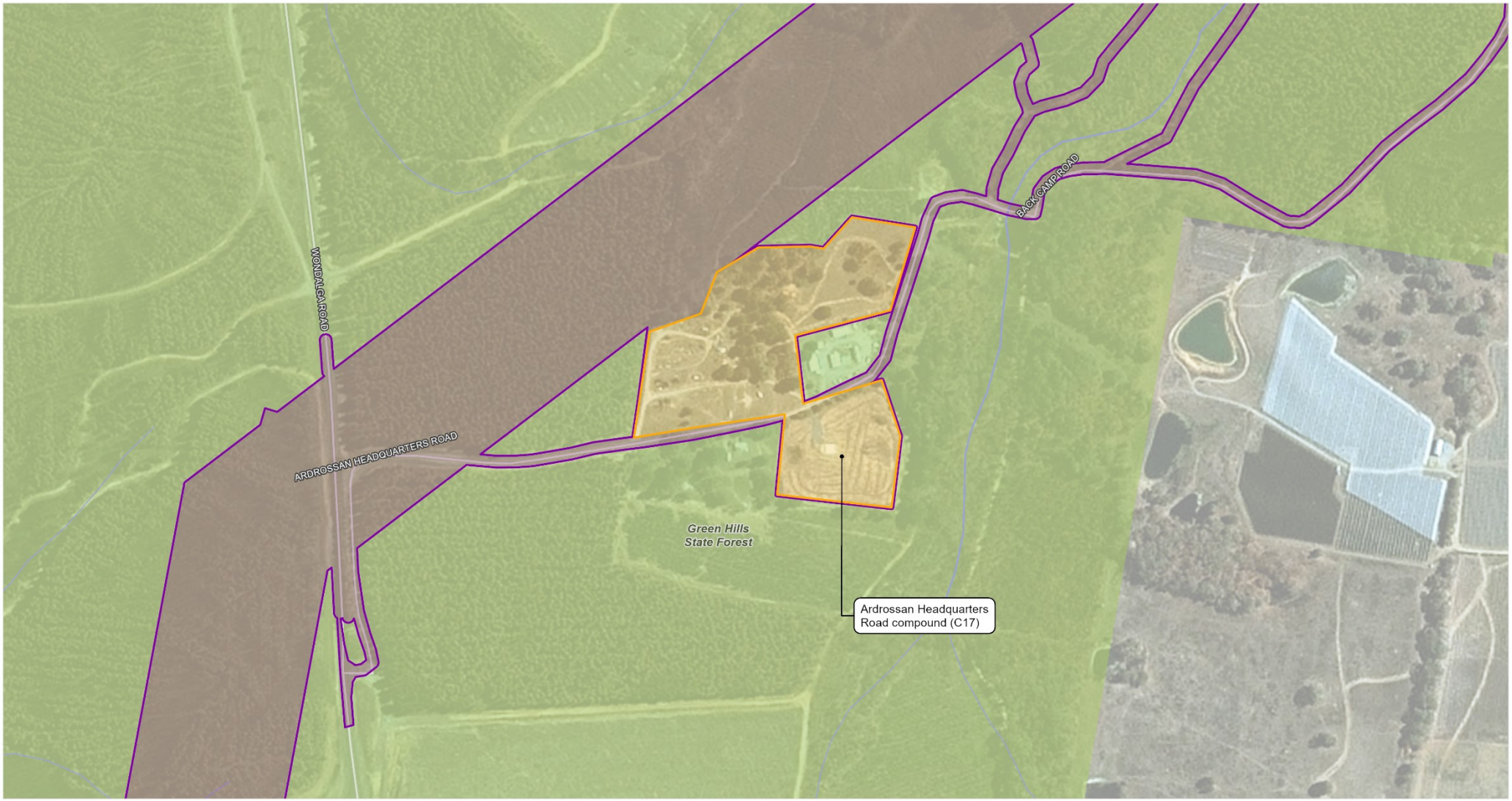
Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 3-4b: Changes to construction compounds



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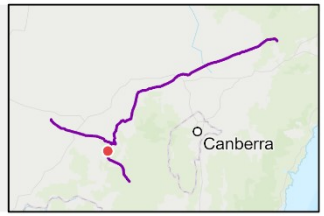
Amended project footprint

Construction compound site

State forest

Waterway



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

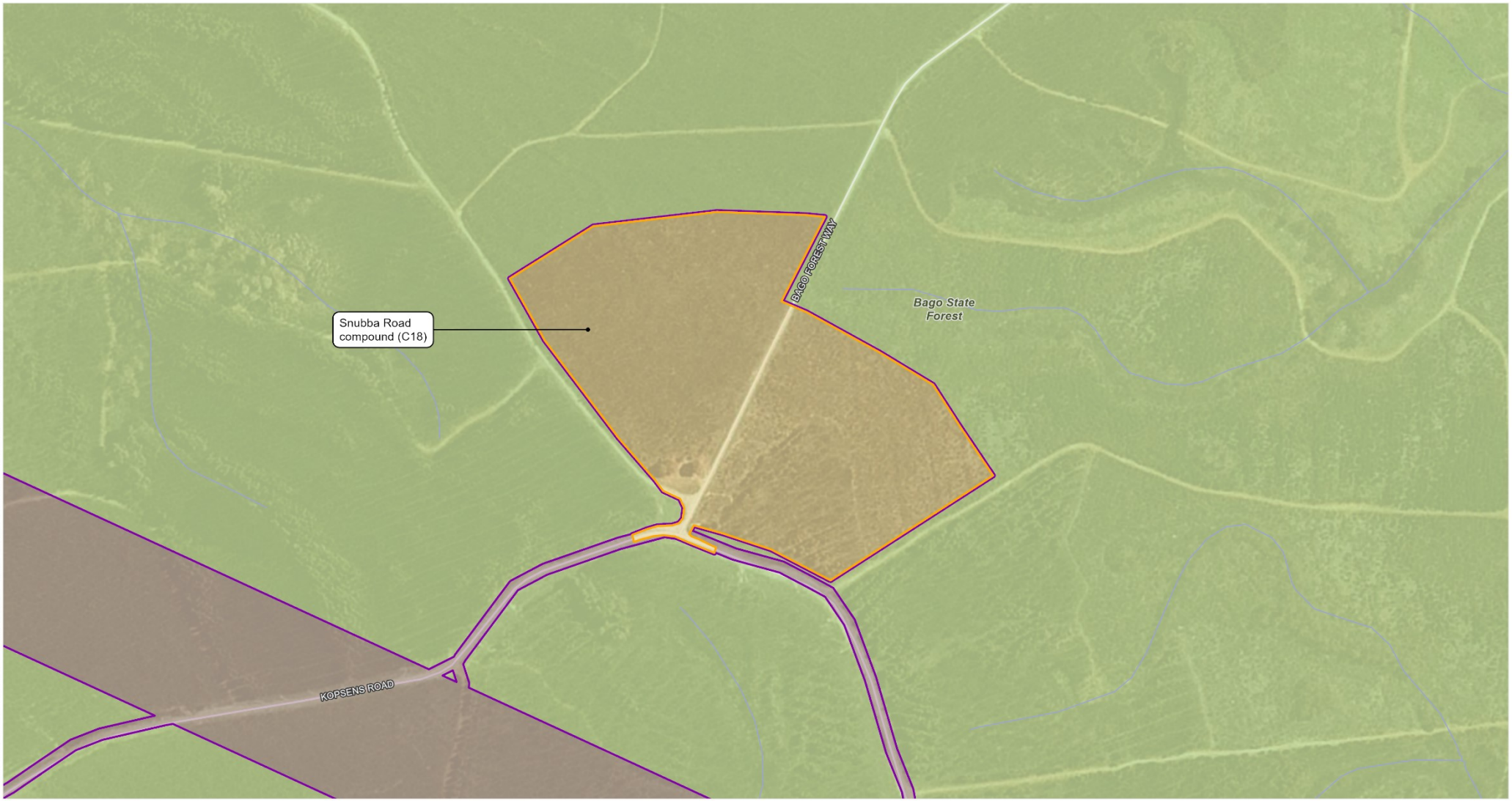
1:5,000

0 0.1 0.2km

Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 3-4c: Changes to construction compounds



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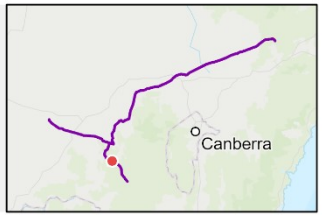
Amended project footprint

Construction compound site

State forest

Waterway



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

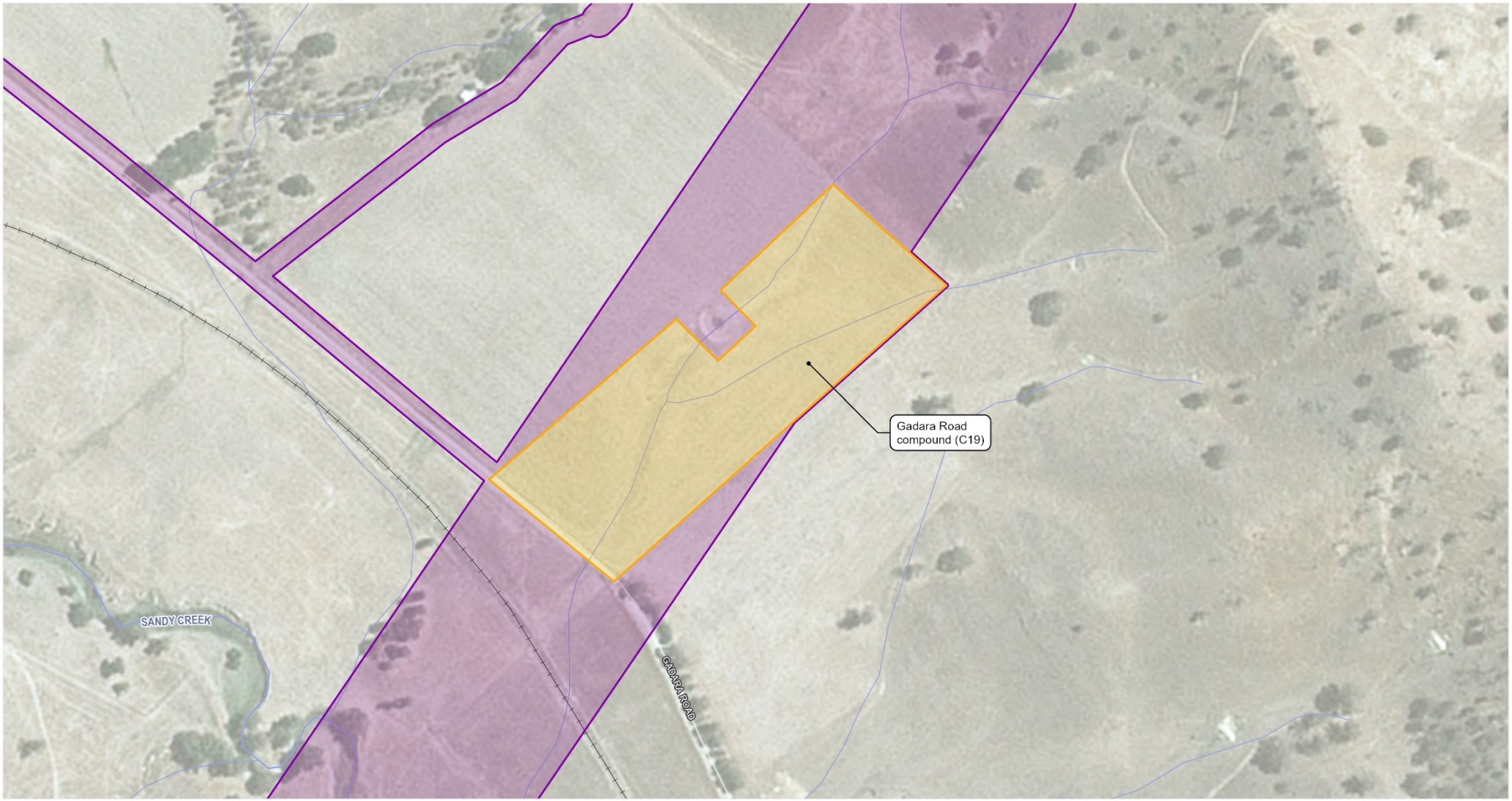
1:5,000

0 0.1 0.2km

Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 3-4d: Changes to construction compounds



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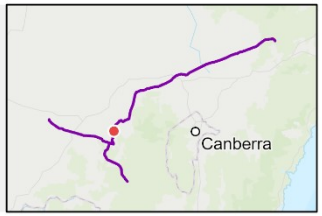
Amended project footprint

Construction compound site

Waterway

Railway



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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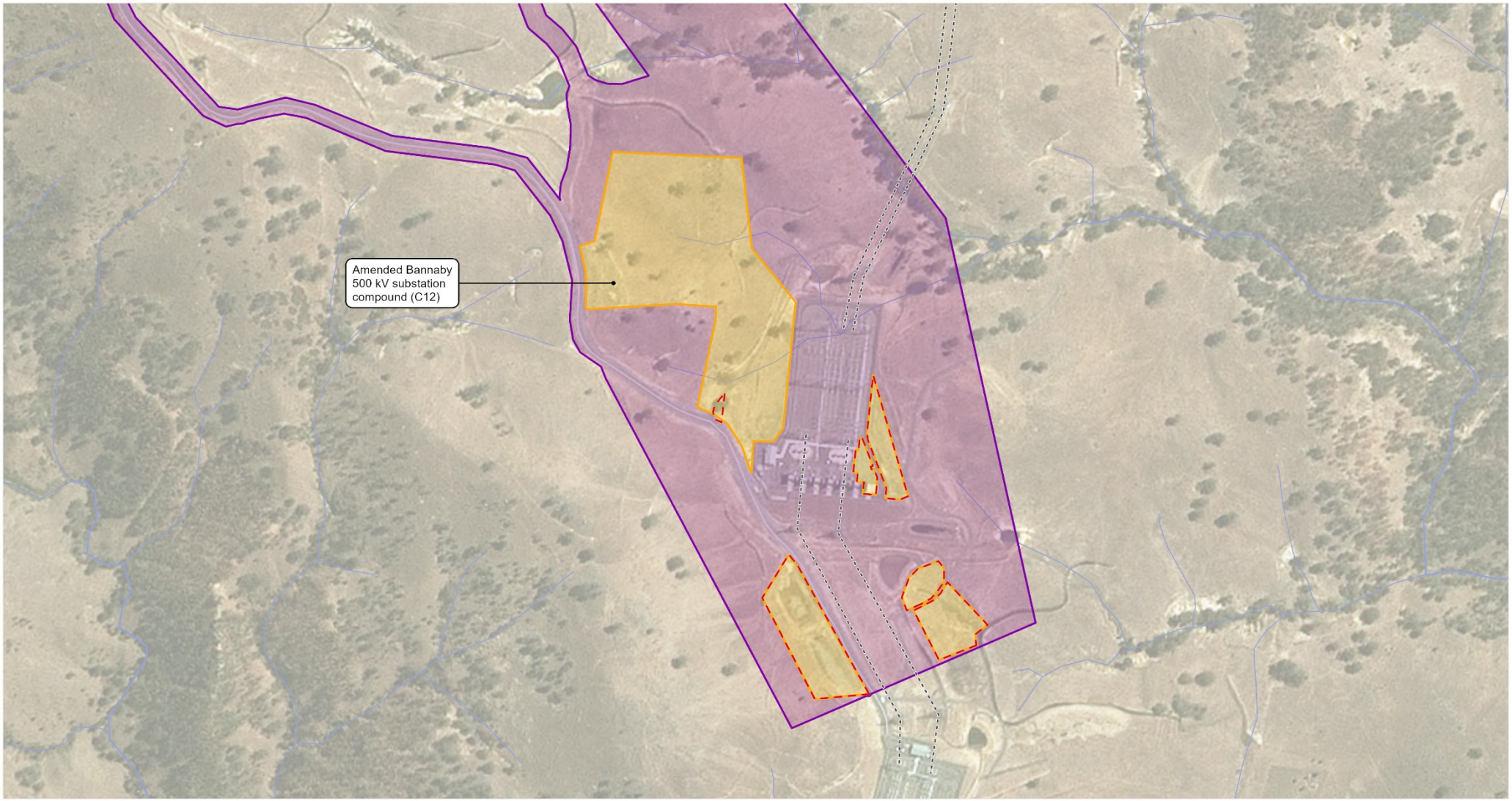
Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 3-4e: Changes to construction compounds



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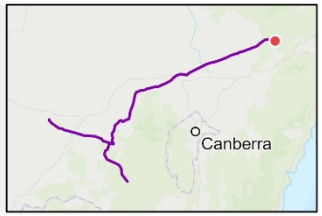
Amended project footprint

Construction compound site

Bannaby substation compound (C12) as shown in EIS

Existing Transgrid transmission line

Waterway



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

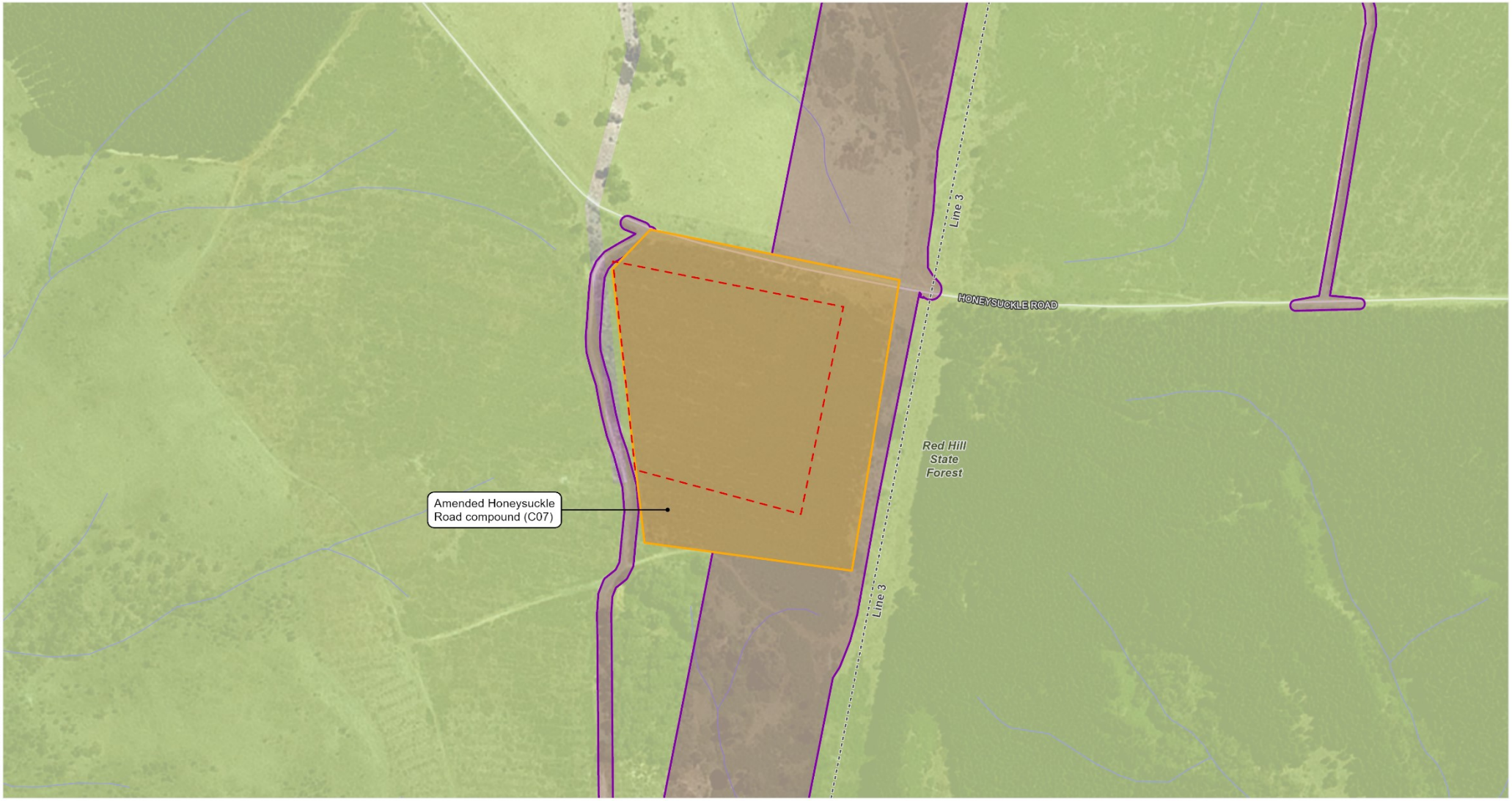
1:5,500

0 0.1 0.2 km

Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 3-4f: Changes to construction compounds



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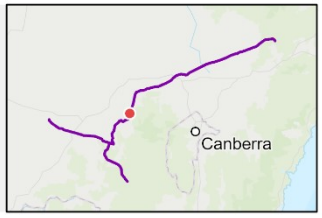
Amended project footprint
Construction compound site
Honeysuckle Road compound (C07) as shown in EIS
State forest
Existing Transgrid transmission line
Waterway



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:5,500
0 0.1 0.2 km

Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 3-4g: Changes to construction compounds

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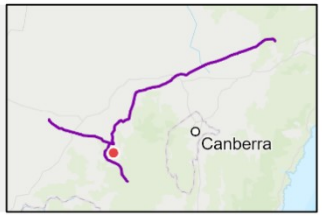
Amended project footprint

Construction compound site

Memorial Avenue Compound (C14) as shown in EIS

Waterway

Railway



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:2,500

0 0.1 0.1 km

Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 3-4h: Changes to construction compounds

3.4. Nomination of access tracks

3.4.1. EIS description

3.4.1.1. Access during construction

Section 4.2.1.4 of the EIS described the need for access tracks during construction and the types of access tracks likely to be required, including:

- Unimproved access tracks – consisting of existing roads or tracks, or where existing soil or ground surface required minimal or no prior preparation. Some stabilisation of unimproved access tracks with a suitable capping material may be required where there are potential erosion and sedimentation risks.
- Constructed access tracks – required in areas where there are no existing roads or tracks or where terrain conditions prevented continuous access along the transmission line between road crossings. In these situations, 'off easement' access may be required, and suitable access tracks would be constructed. All new access tracks included a trafficable surface between three and six metres wide with a one or two-metre shoulder and generally followed the natural contour of the land as far as practicable to minimise the amount of cut and fill and soil disturbance. Table 4-3 of the EIS provided guidelines that would be followed during the design and construction of the constructed access tracks.

Section 4.2.1.4 of the EIS also noted that access tracks may need to be connected to the existing road network. Where this occurs, road improvement work may be required to facilitate safe vehicle access. The type of work would depend on factors such as the existing environment and road type at the point of connection, existing traffic volumes and the type of vehicle requiring access. Section 4.2.1.6 of EIS provided further details on the type of work and detailed design requirements for connecting access tracks to the existing road network based on the road type that was being connected. Connection work would be carried out in accordance with the relevant Austroads Guides, any road occupancy licence(s), and in consultation with the relevant road authority.

3.4.1.2. Access during operation

Section 3.3.4 of the EIS stated that access tracks created for construction would generally be retained during the operation of the project to provide ongoing access.

3.4.2. Amendment description

3.4.2.1. Access during construction

Following further construction planning, feedback from NSW Department of Climate Change, Energy, the Environment and Water – Environment and Heritage (NSW DCCEEW – Environment and Heritage) and consultation with affected landowners, additional access tracks have been nominated to include the full extent of access tracks between the transmission line corridor and the existing road network. These additional tracks are required to provide safe access/egress while minimising the environmental impacts of the project where possible. Priority has been given to the use and upgrade of existing access tracks over the creation of new access tracks, where possible.

The additional access tracks nominated for the amended project would generally follow the hierarchy discussed in Section 4.2.1.4 of the EIS (ie use existing tracks and upgrade where required, or construct new tracks where there are no alternatives available). The nomination of access track alignments and extents have also considered feedback received during consultation with affected landowners prior, during and subsequent to the public exhibition of the EIS, where possible.

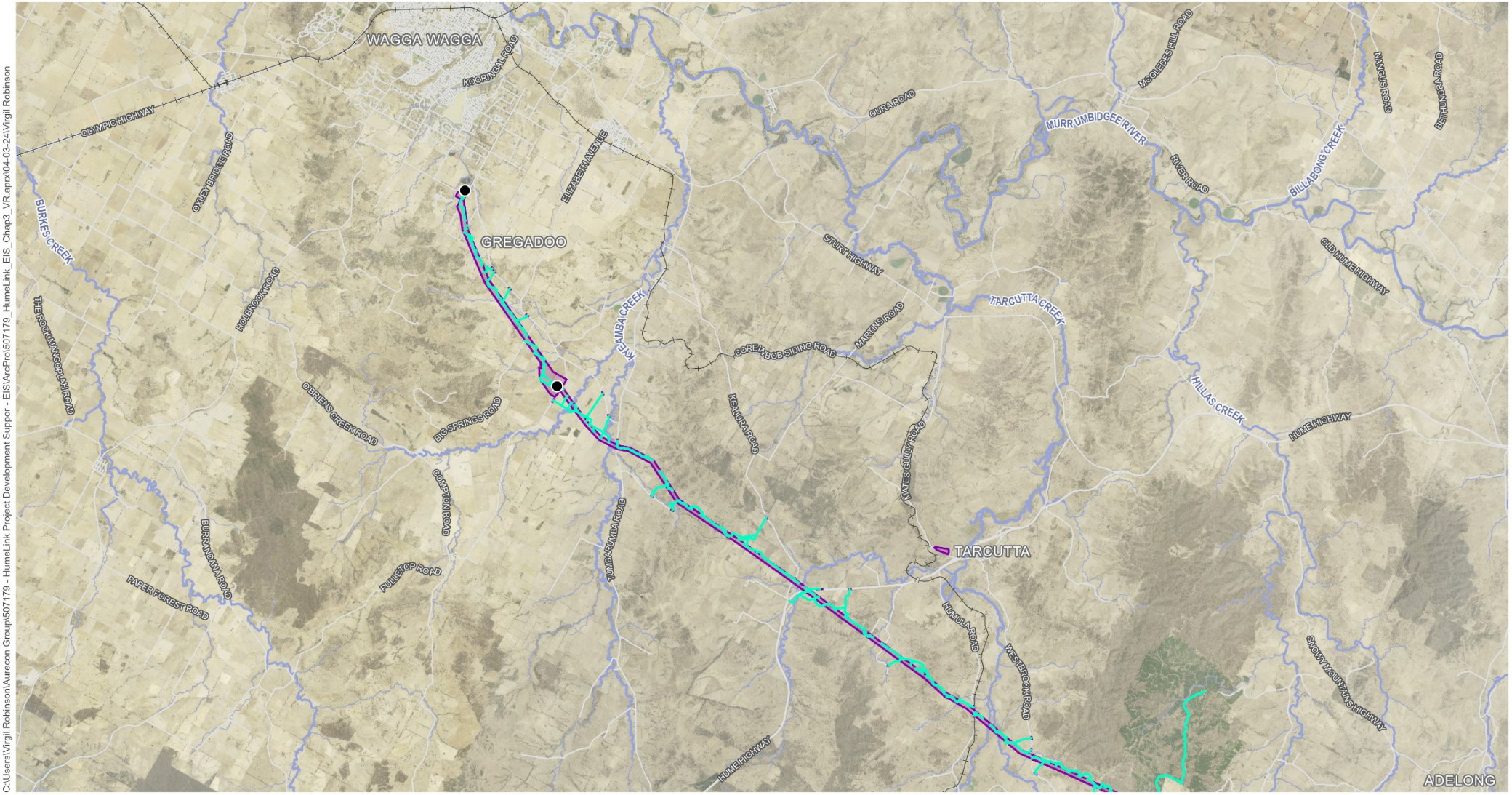
Access tracks would be maintained, upgraded or constructed in accordance with the requirements described in Table 4-3 of the EIS. Any new or upgrades to existing waterway crossings would be carried out per Section 4.2.1.5 of the EIS and the relevant mitigation measures detailed in Appendix B (Updated mitigation measures). The type of treatment required, if any, to connect the additional access tracks to the existing road network would remain consistent with Section 4.2.1.6 of EIS. Where required, intersection works with public roads will be designed and constructed in accordance with relevant Austroads guides or the relevant asset owners' standards, any road occupancy licence(s), and in consultation with the relevant road authority.

Table 3-5 describes the expected work likely to be involved to make the nominated access tracks suitable for heavy vehicle movements. The full extent of work would be confirmed following further review and survey of the nominated access tracks. Figure 3-5 shows the location of the nominated access tracks along the project footprint.

Table 3-5 Description of proposed work at nominated access tracks

Access track	Description
Existing tracks/ roads	Existing access tracks/roads include well-established unsealed local roads, forest roads and tracks maintained by FCNSW or unsealed property access tracks, generally suitable for heavy vehicles. Some existing access tracks/roads may be subject to maintenance activities or minor upgrades along the formation, such as resurfacing or grading, or drainage work. Minor vegetation pruning/trimming may be required in some locations where vegetation may be considered a roadside hazard. Where pruning/trimming is required, it would be undertaken to avoid impacts on the long-term viability of the vegetation.
Upgraded tracks	Upgraded access tracks typically consist of unsealed property access tracks of varying conditions, from well-established sections to rarely used, barely visible sections (ie requiring substantial upgrade). The existing gradient of upgraded access tracks varies and may only be suitable for light vehicles without these upgrades. Upgraded access tracks are expected to require more substantial work to allow their use during construction compared with existing tracks/roads. Work may include earthworks to improve gradients, grading or resurfacing, formation widening to 8 m or realignment, drainage work or upgrades to waterway crossings. Vegetation clearing or pruning/trimming may be required for widening/formation work or where vegetation may be considered a roadside hazard. The total clearing width would generally be up to 10 m, with some limited areas (eg steep terrain) requiring a clearing width of up to 20 m for batters.
New tracks	The locations of new access tracks have generally been selected in consultation with affected landowners to minimise property impacts, including running the track along fence lines, using movement paths preferred by landowners, and going through existing property gates. Establishing the new tracks would typically include earthworks, grading, drainage work and construction of waterway crossings. Fill material may be imported to provide a suitable capping material. To establish the new tracks, vegetation clearing or pruning/trimming may be required. The total clearing width would generally be up to 10 m, with some limited areas (eg steep terrain) requiring a clearing width of up to 20 m for batters.

Any changes to the access track extents and intersection works with public roads would be managed in accordance with the change management process described in Section 26.4 (Managing project changes) of the EIS in consultation with affected landowners and relevant road authority.



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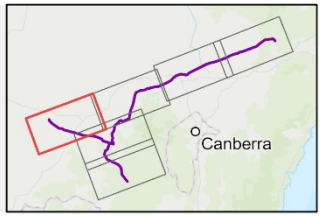
Amended project footprint

Access track (part of amended project footprint)

Railway

Waterway

Substation



Source: *Aurecon, Transgrid, Department of Regional New South Wales, Spatial Services (DCS), ESRI Basemap*

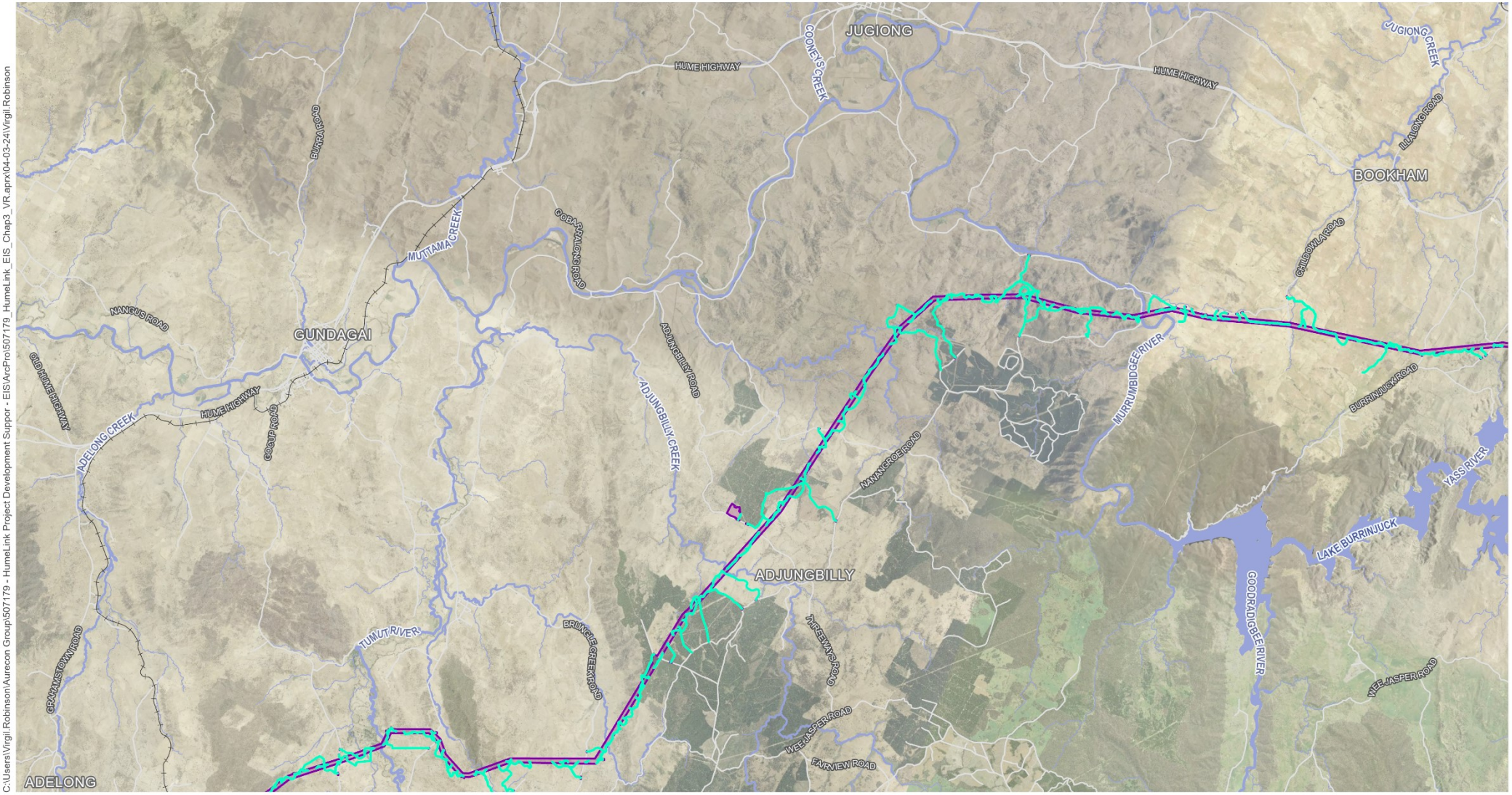
1:200,000

0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink

Figure 3-5a: Nominated access tracks



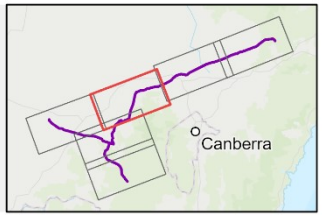
Amended project footprint

Access track (part of amended project footprint)

Railway

Waterway

Substation



Source: *Aurecon, Transgrid, Department of Regional New South Wales, Spatial Services (DCS), ESRI Basemap*

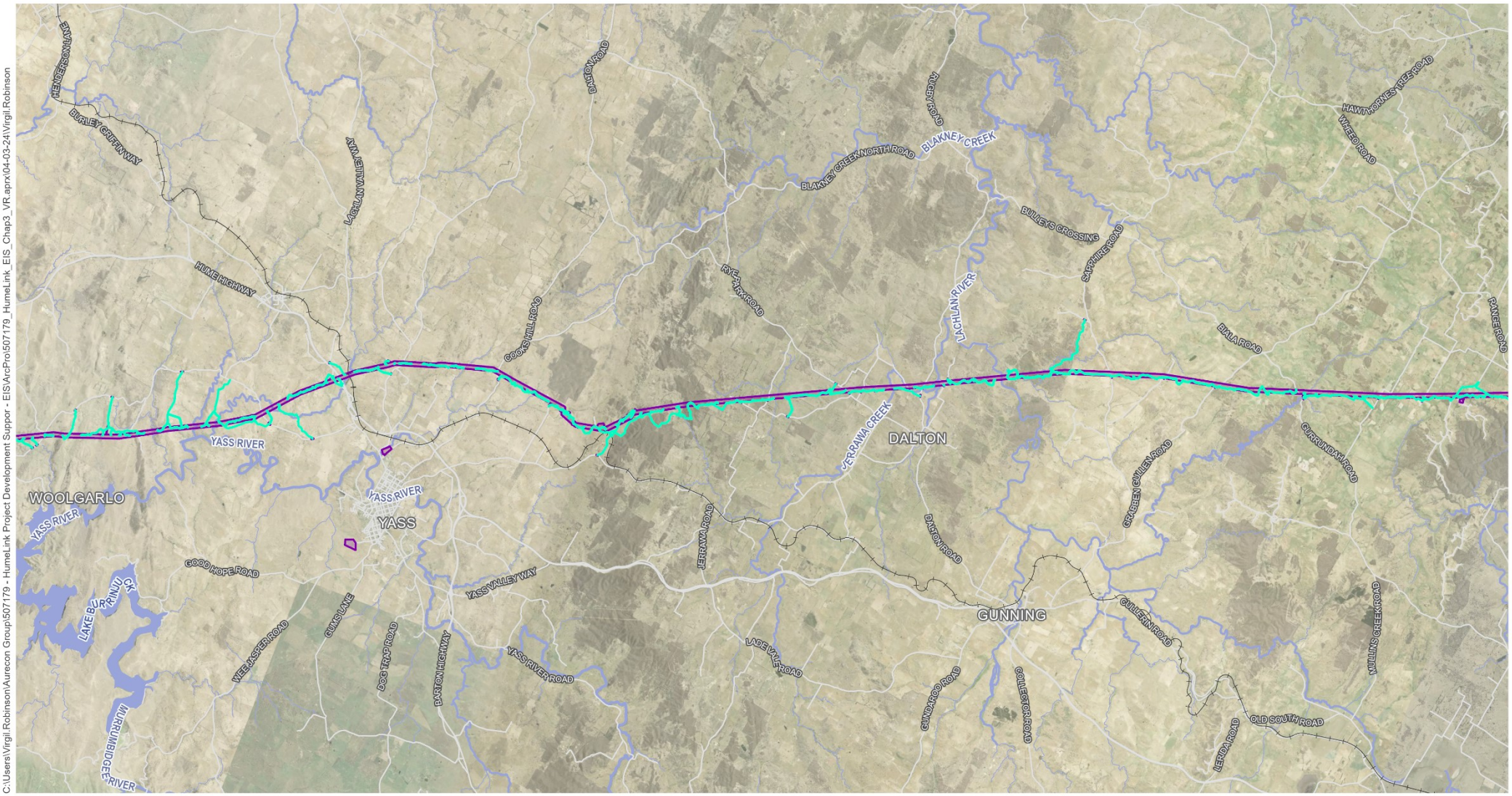
1:200,000

0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink

Figure 3-5b: Nominated access tracks



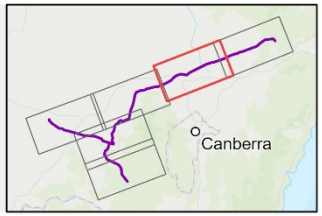
Amended project footprint

Access track (part of amended project footprint)

Railway

Waterway

Substation



Source: *Aurecon, Transgrid, Department of Regional New South Wales, Spatial Services (DCS), ESRI Basemap*

1:200,000

0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink

Figure 3-5c: Nominated access tracks

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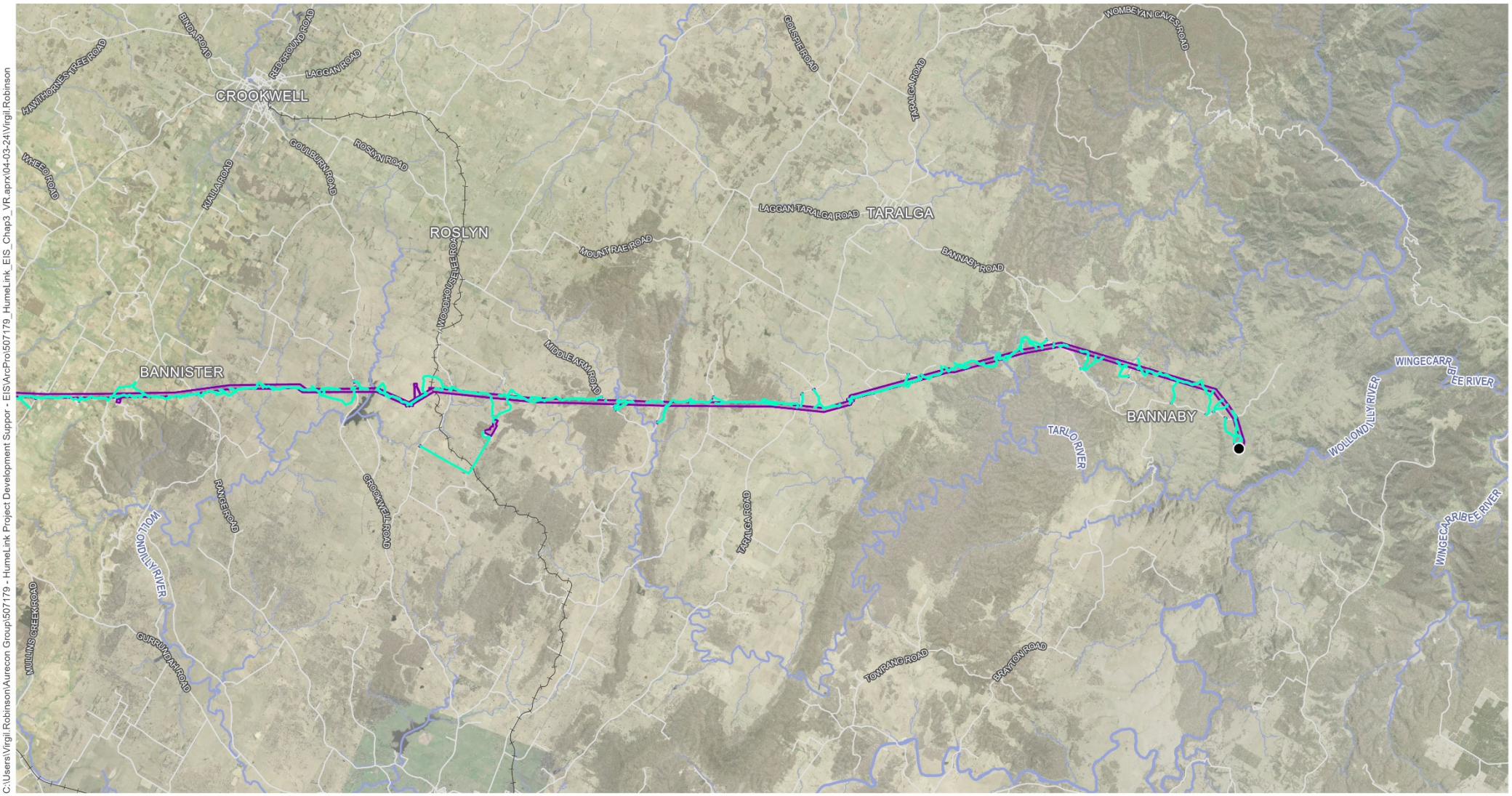

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Source: *Aurecon, Transgrid, Department of Regional New South Wales, Spatial Services (DCS), ESRI Basemap*

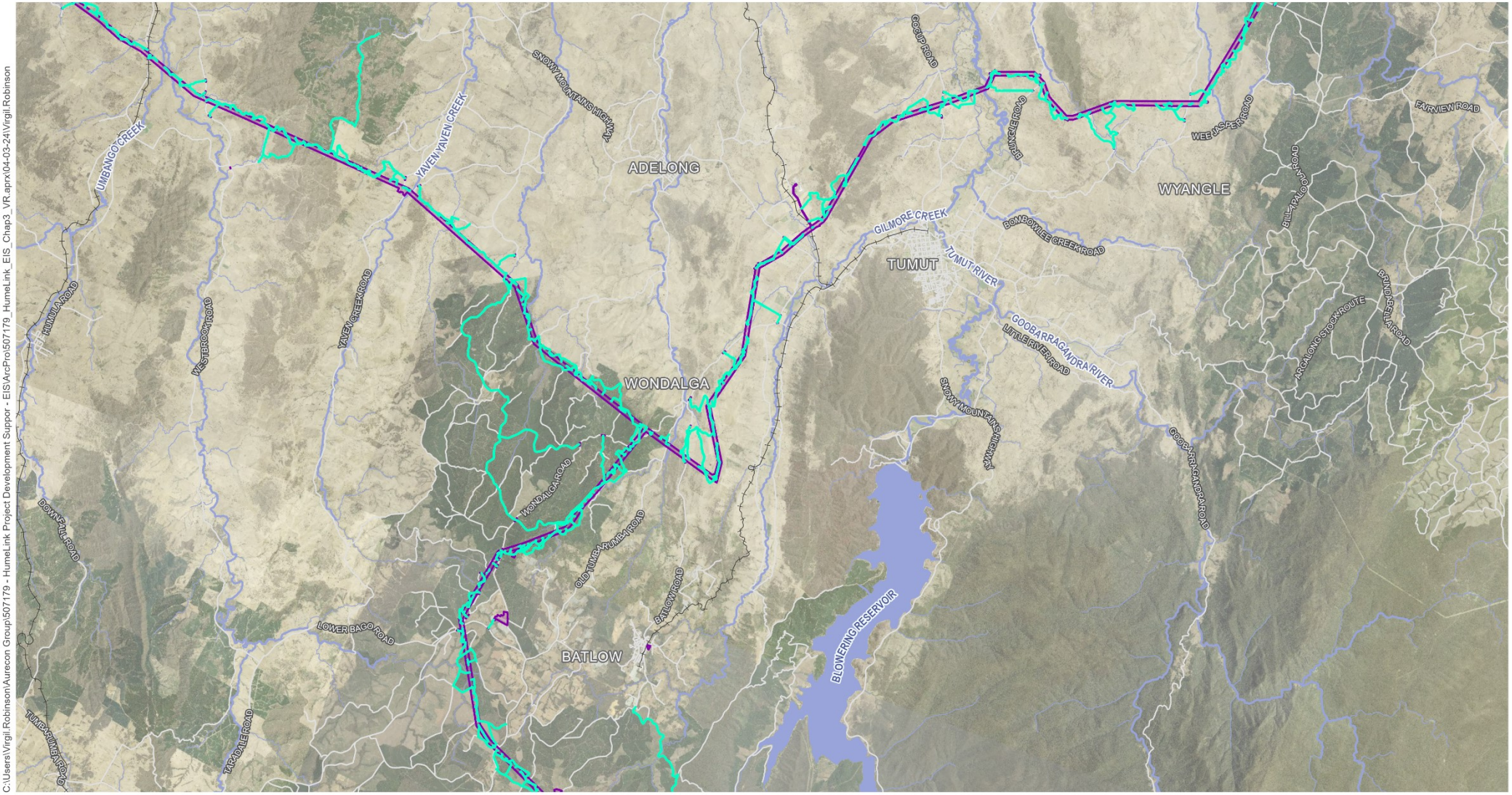
1:200,000

0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink

Figure 3-5d: Nominated access tracks



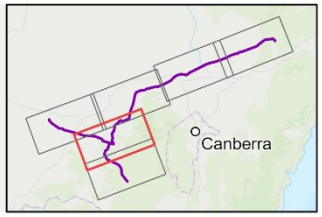
Amended project footprint

Access track (part of amended project footprint)

Railway

Waterway

Substation



Source: *Aurecon, Transgrid, Department of Regional New South Wales, Spatial Services (DCS), ESRI Basemap*

1:200,000

0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink

Figure 3-5e: Nominated access tracks

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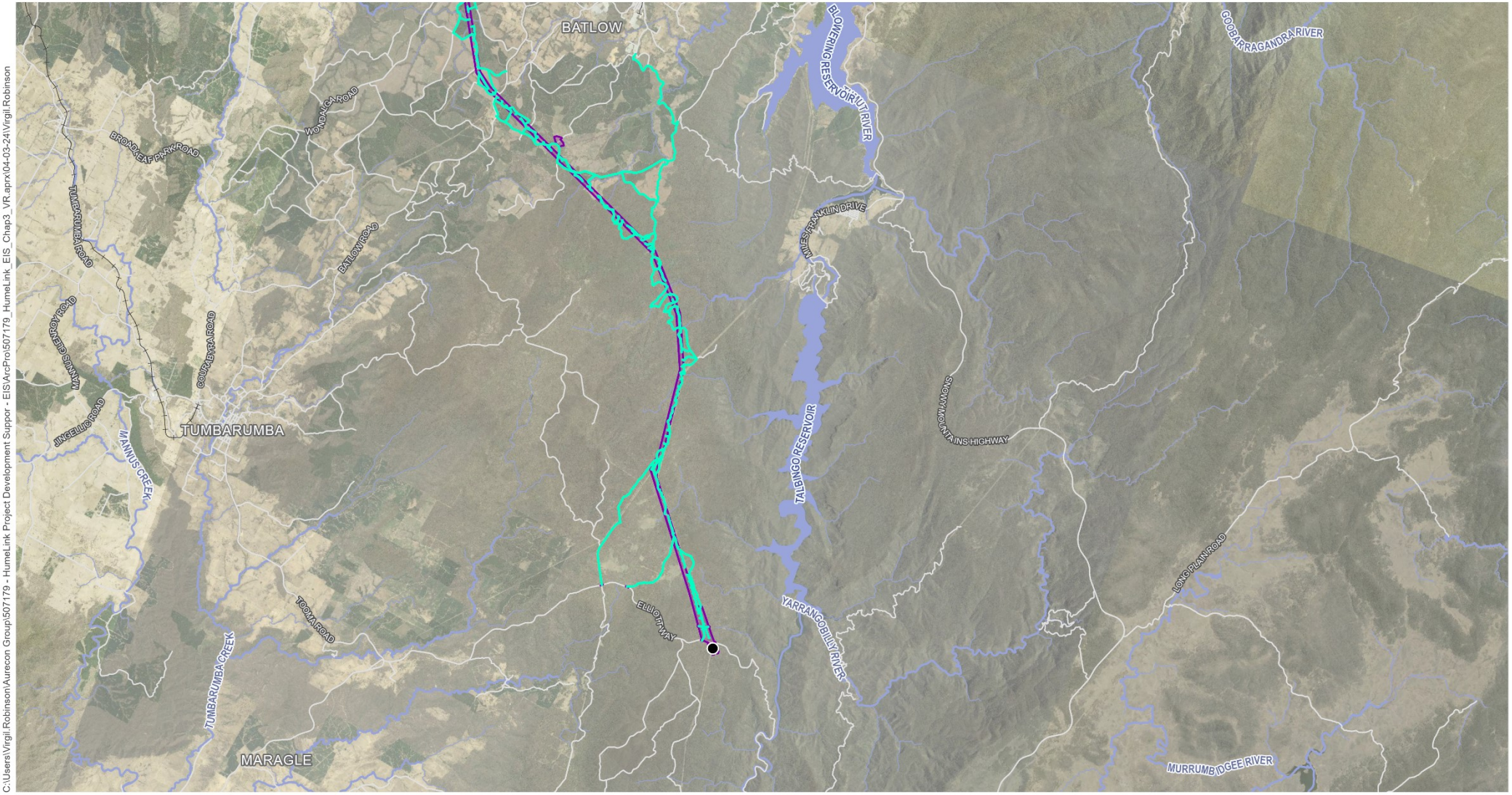

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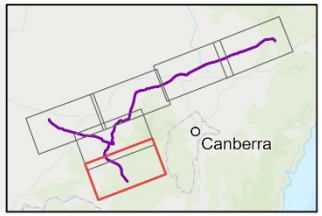
Amended project footprint

Access track (part of amended project footprint)

Railway

Waterway

Substation



Source: *Aurecon, Transgrid, Department of Regional New South Wales, Spatial Services (DCS), ESRI Basemap*

1:200,000

0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink

Figure 3-5f: Nominated access tracks

3.4.2.2. Access during operation

Wherever possible, access tracks have been chosen in consultation with landowners with individual land use needs in mind to provide mutually beneficial outcomes for the construction and operation of the project, and the landowner's land use as well as minimising the overall environmental impacts. The requirements to retain or reinstate access tracks will be determined in consultation with landowners during property negotiations and ahead of the commencement of operation.

Use of some upgraded tracks and new tracks would be required during operation of the project for asset maintenance given their general proximity to the transmission line corridor. However, these asset maintenance activities can predominantly be undertaken with light vehicle access within the easement and the use of formed access tracks may not be required to all transmission line structures.

Based on the current level of design development and construction planning, it is estimated that about 40 per cent of substantially upgraded tracks and new tracks, would be restored with groundcover following construction. This estimate excludes upgraded tracks which are currently well established and regularly utilised by landowners.

The final extent of reinstatement is uncertain given that some landowners may wish to retain access tracks which Transgrid do not intend to use for asset maintenance. Transgrid will continue to work with landowners to determine the post construction condition of access tracks. All requirements will be documented within the property specific property management plans (PMPs) or as otherwise agreed with the landowner.

3.5. Additional telecommunications connections to existing substations

3.5.1. EIS description

Section 3.5 of the EIS detailed the need to ensure the stability of the project's communications system between the substations and over long distances. Telecommunications huts generally provide this stability for the communications system and are required to be located along transmission lines greater than 135 kilometres long. The telecommunications huts contain optical repeaters, which boost the signal in the overhead earth wire and optical ground wire (OPGW) and back-up power supplies over long distances. However, telecommunications connections to existing substations can be an alternative to a telecommunications hut as existing substations already have a local power supply whereas a telecommunications hut needs a local power supply connection.

For the EIS project, it was proposed to establish a telecommunications hut at Killimicat and include a telecommunications connection with the future Rye Park Wind Farm substation (which has since become operational and is now referred to as the 'Rye Park 330 kV switching station'). Figures 3-10 and 3-1c of the EIS showed the location of the proposed telecommunications hut at Killimicat and the connection with the Rye Park 330 kV switching station, respectively.

3.5.2. Amendment description

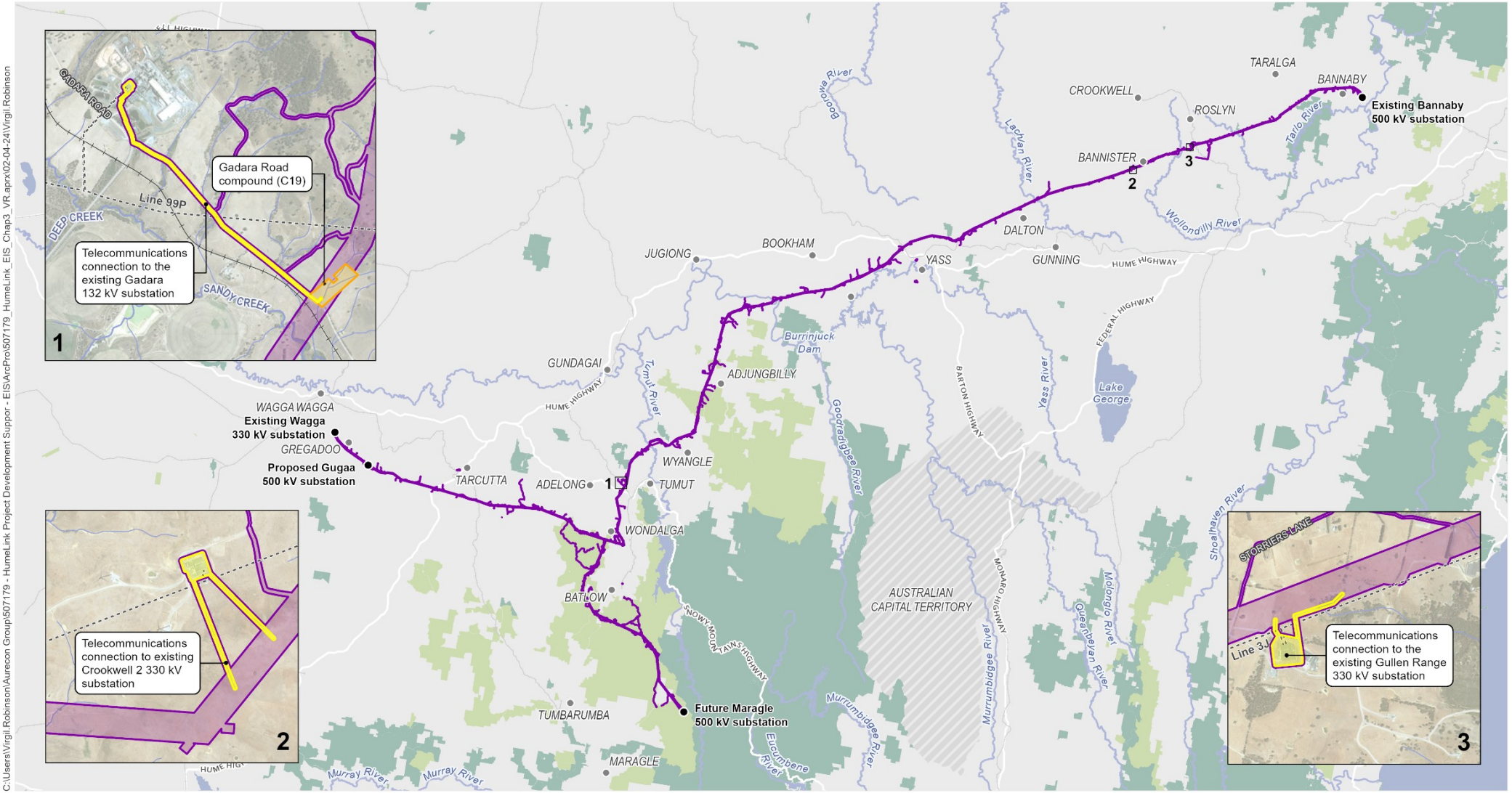
Following further design development, three additional telecommunications connections to existing Transgrid substations along the transmission line corridor are proposed for the amended project. This includes installing underground fibre optic cables between the transmission line and existing substations at:

- Gadara 132 kV substation, Gadara. This would involve approximately 2.6 kilometres of trenching and cable installation.
- Gullen Range 330 kV substation, Bannister. This would involve approximately 1.1 kilometres of trenching and cable installation.
- Crookwell 2 330 kV substation, Woodhouselee. This would involve approximately 1.7 kilometres of trenching and cable installation.

These additional telecommunications connections as part of the amended project remove the need for the telecommunications hut at Killimicat and associated property impacts. The telecommunications connection with the Rye Park 330 kV switching station would still be undertaken as described in the EIS. The additional telecommunications connections and connection to Rye Park 330 kV switching station would provide stability for the project's communications system and are located to ensure distances between the substations and connections are less than 135 kilometres.

Work associated with the new telecommunications connections would involve excavating to an appropriate depth (ie generally between 0.6 metres to 1.2 metres). Once the appropriate depth is reached, the underground fibre optic cable and conduit would be installed, and the trench backfilled accordingly with excavated material or a sand/cement mix if additional protection is required. Cable pits and marker posts would also be installed where needed. Work associated with the connection to Gadara 132 kV substation would be carried out under traffic control as required.

Figure 3-6 shows the locations of additional telecommunications connections to the substations along the transmission line corridor.



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 3-6: Additional telecommunications connections to existing substations

3.6. Transmission line and substation design refinements at Gregadoo

3.6.1. EIS description

Section 3.3.1.1 of the EIS stated that the new double-circuit transmission line between the existing Wagga 330 kV substation and the proposed Gugaa 500 kV substation would be energised at 330 kV but with the capability to be operated at 500 kV if required in the future. Any future energisation at 500 kV would be subject to further assessment and approval. Accordingly, the EIS assessed the transmission line between the existing Wagga 330 kV substation and the proposed Gugaa 500 kV substation operating at 330 kV.

Sections 3.4.1 and 3.4.2 of the EIS discussed the design features of the proposed Gugaa 500 kV and the proposed modification of the existing Wagga 330 kV substation.

3.6.2. Refinement description

Following further design development and consideration of the proposed VNI West project, the amended project includes the potential future energisation of the transmission line at Gregadoo between the existing Wagga 330 kV substation and the proposed Gugaa 500 kV substation at 500 kV. Energisation at 500 kV would only occur during the commissioning and operational phase of the proposed VNI West project, which is subject to a separate planning approval[2]. Until such time, the transmission line proposed between the existing Wagga 330 kV substation and proposed Gugaa 500 kV substation as part of HumeLink would operate at 330 kV.

To facilitate the future integration of the proposed VNI West project with HumeLink, additional infrastructure at the proposed Gugaa 500 kV substation is required.

The refinement requires infrastructure additional to that outlined in Section 3.4.1.1 of the EIS to be included at the proposed Gugaa 500 kV substation for the future integration of the proposed VNI West project including:

- three single-phase transformers
- one three-phase reactor.

To accommodate the additional infrastructure and due to further design development, the layout and size of the proposed Gugaa 500 kV substation has been adjusted to include a split bench compared to the single bench in the EIS project. The split bench is proposed to have an overall maximum width of about 285 metres, a maximum length of about 490 metres and a 20 metres buffer area around each bench. The refined substation development area would occupy approximately 34 hectares compared to 22 hectares for the EIS project, and its siting within the amended project footprint has been refined with consideration of local sensitive receiver feedback.

Additional earthwork, foundations and steelwork would be required for the refined substation. Adjustments have also been made to the Asset Protection Zone (APZ), fencing, drainage and access road design in response to the refined layout.

[2] More information on the VNI West project is available on the Transgrid website here: www.transgrid.com.au/projects-innovation/vni-west

Other design features associated with safety and security, lighting, wastewater and oil containment remain generally consistent with the EIS project and descriptions in Section 3.4.1 of the EIS. Similarly, the construction methodology for the amended project at this location would generally remain consistent with the EIS project and descriptions in Section 4.2.2.2 of the EIS.

The refinement results in several benefits compared to the EIS project, including reduced earthworks, increasing separation distance to the closest sensitive receiver, and improved constructability with the use of split benches and increased size. The refinement also provides the opportunity to reduce potential cumulative impacts at this location with less work required to facilitate the proposed VNI West project integration work. Furthermore, the refinement provides the opportunity to avoid the need for future outages/shutdowns, reducing the extent and duration of proposed construction work required for the proposed VNI West project and minimising the potential for rework.

Figure 3-7 shows the refined layout to the proposed Gugaa 500 kV substation.

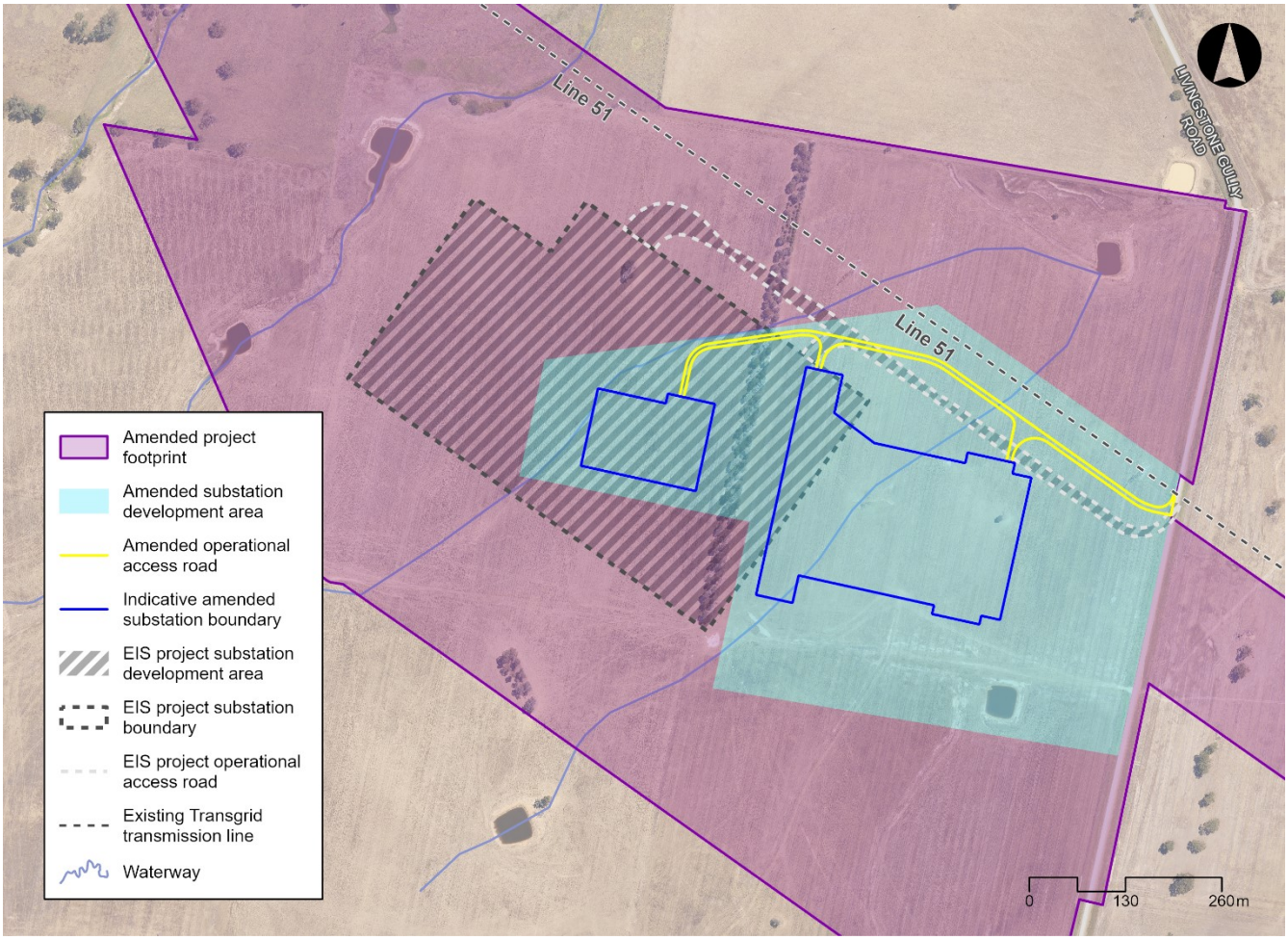


Figure 3-7 Substation design refinements at the proposed Gugaa 500 kV substation

3.7. Identification of where controlled blasting may be required

3.7.1. EIS description

Sections 4.2 and 15.4.4 of the EIS discussed that blasting may be required to construct the EIS project, depending on geotechnical conditions. However, sites where blasting may be necessary were not determined for the EIS project. The need and locations for blasting were to be confirmed during the detailed design. Any potential noise and vibration impacts from blasting were proposed to be managed by implementing a Blast Management Plan.

3.7.2. Refinement description

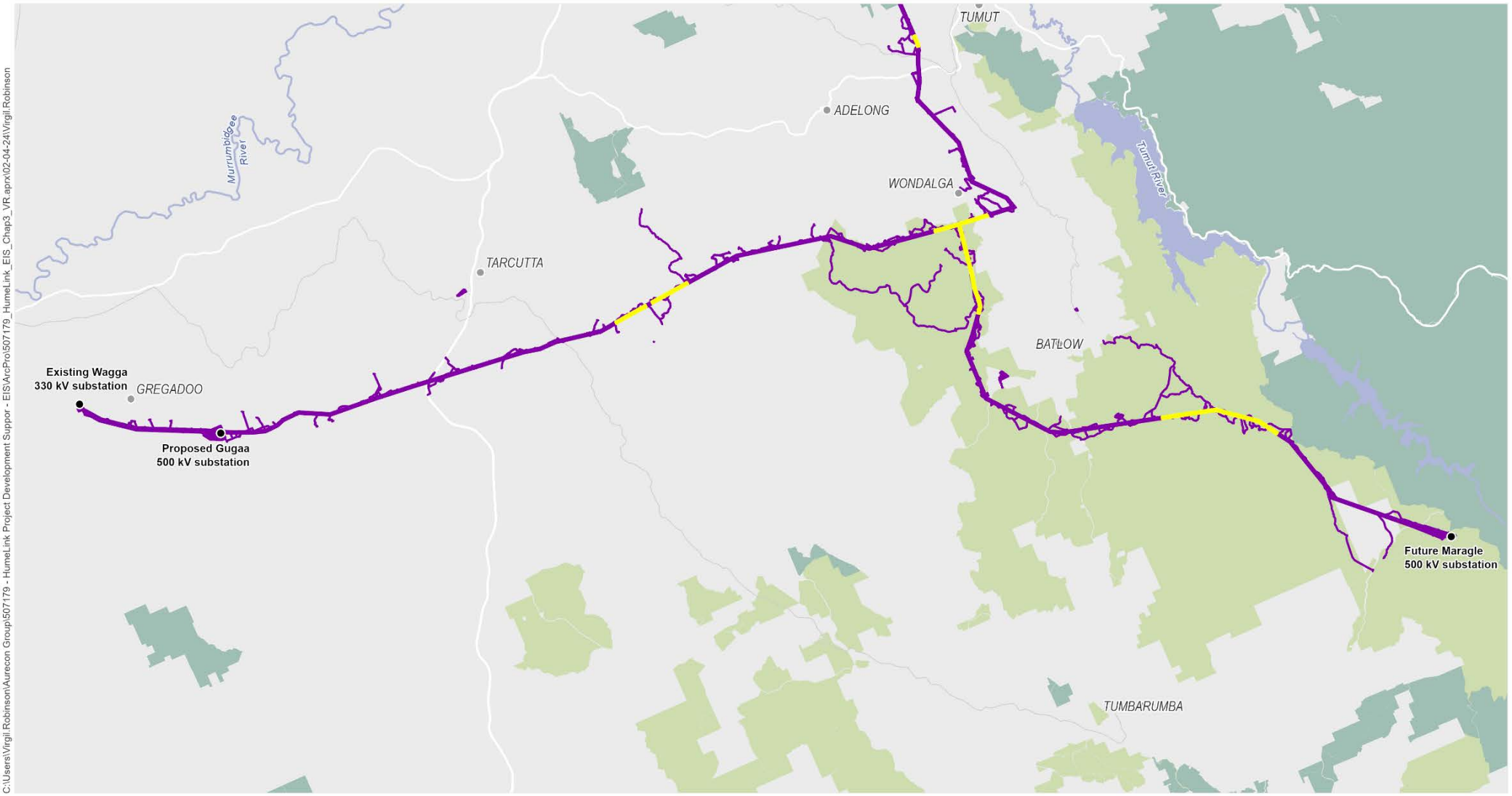
Preliminary geotechnical investigations and further consideration of terrain along the amended project alignment have identified several potential areas where controlled blasting may be required as an alternative to ripping or hammering of rock (refer to Figure 3-8). The extent of the potential areas identified has been developed for assessment purposes. Controlled blasting would not be required for the whole area and would be limited to specific locations within potential controlled blasting areas (refer to Figure 3-8), such as construction benches for transmission line structures and/or limited sections of access tracks. The benefit of controlled blasting would be minimising the earthwork duration and associated duration impacts on landowners at the specific locations within potential controlled blasting areas.

Depending on geotechnical conditions, controlled blasting activities for the amended project may involve a single blast (or a single, consecutive series of blasts) or bench blasting. The smooth blasting technique would be used for blasting activities to produce an excavation contour without fracturing or damaging the rock behind or adjacent to the blasted face.

As per Section 4.6.2 of the EIS, blasting would be undertaken in accordance with the recommended standard hours for blasting from the *Interim Construction Noise Guideline* (DECC, 2009):

- 9am to 5pm Monday to Friday
- 9am to 1pm Saturday
- no blasting on Sundays or public holidays.

The specific controlled blasting locations and how controlled blasting would be managed would be confirmed during finalisation of detailed design and would be documented in the Blast Management Plan for the amended project.



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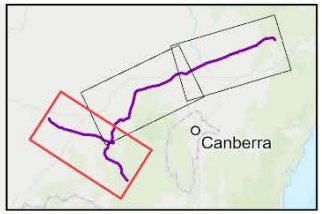
Amended project footprint
Potential controlled blasting area
National park and reserve
State forest
Waterbody
Waterway
Major road
Railway
Substation



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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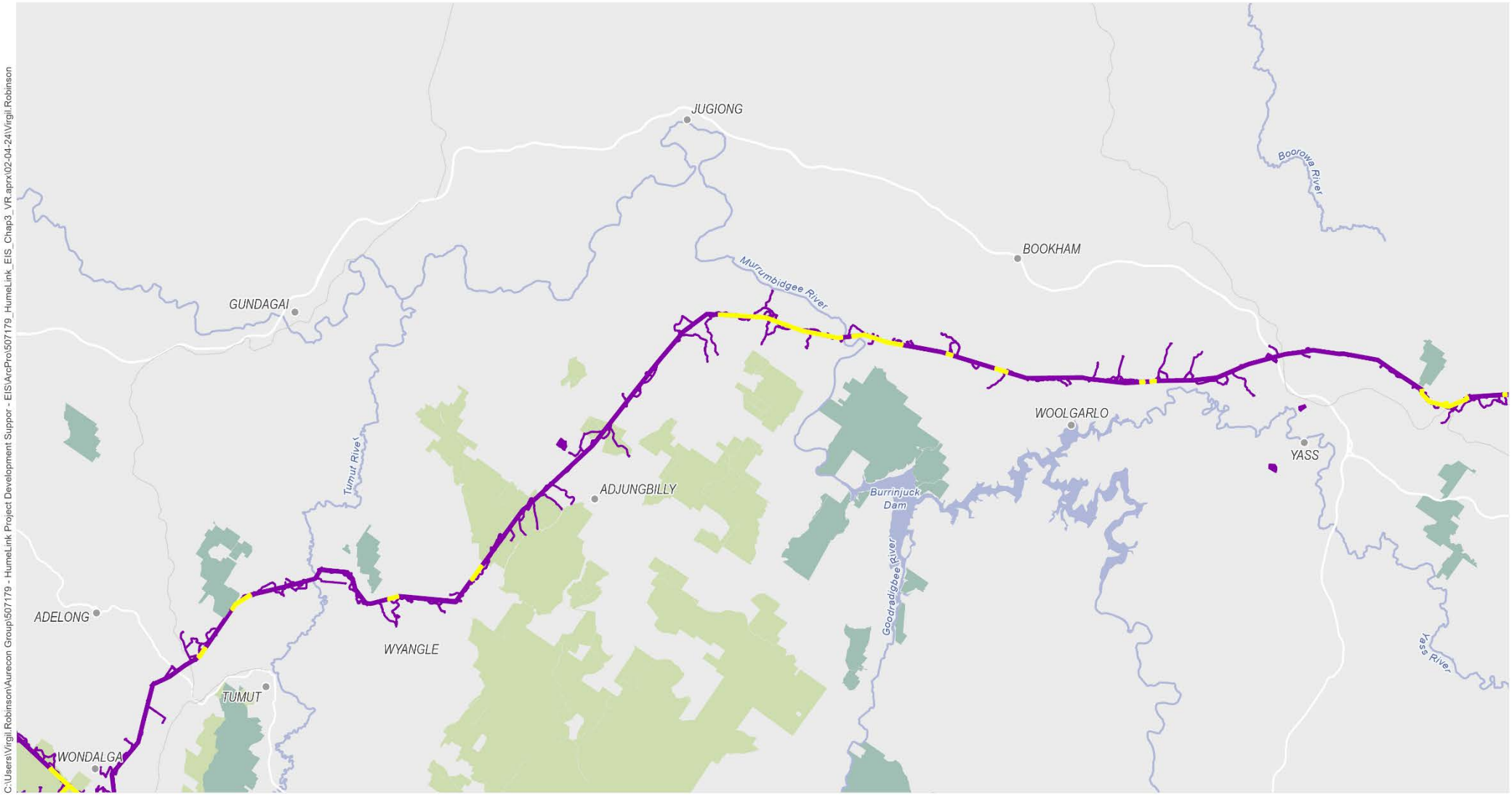
Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 3-8a: Overview of indicative controlled blasting locations



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Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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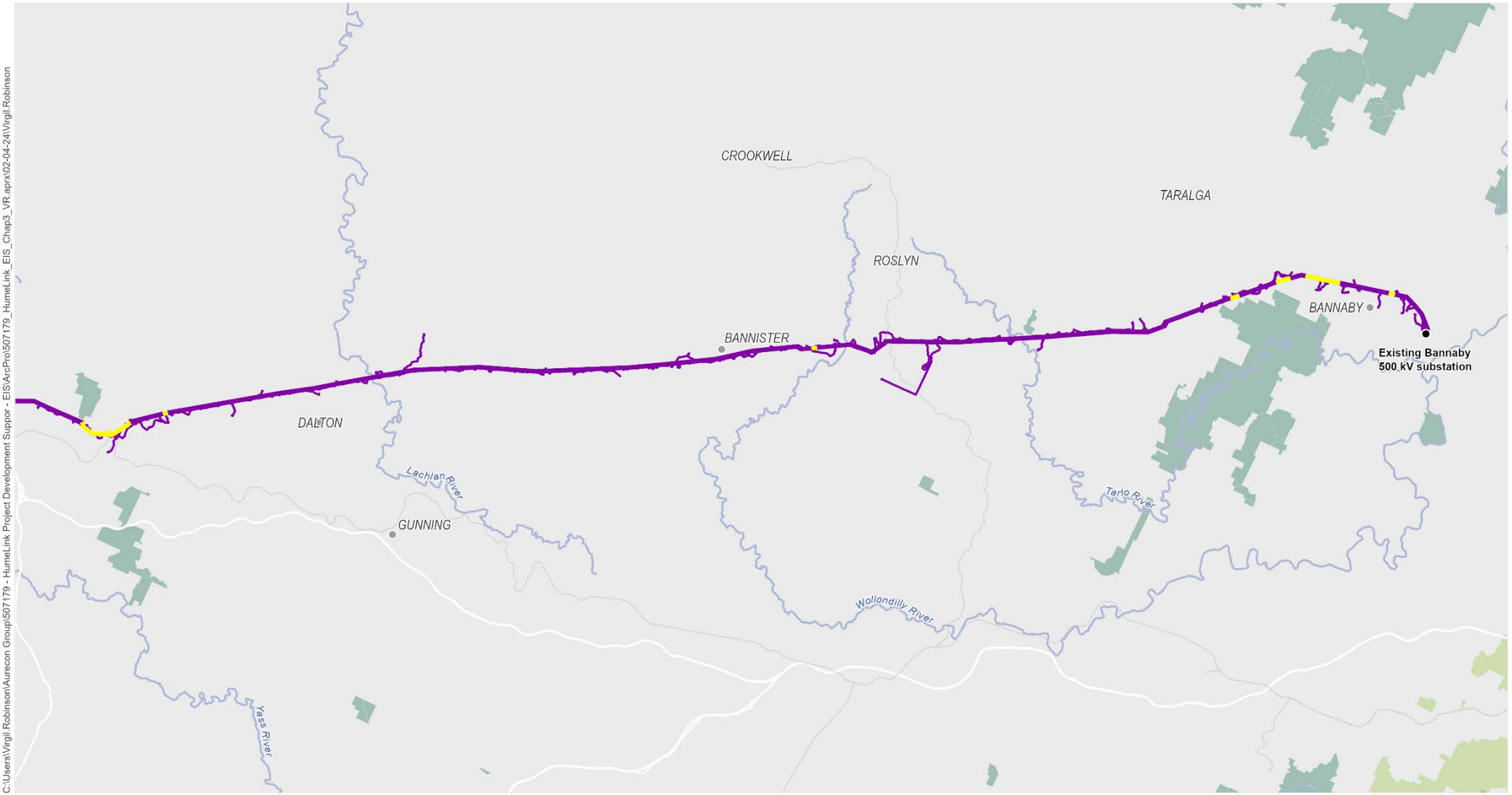
HumeLink

FIGURE 3-8b: Overview of indicative controlled blasting locations



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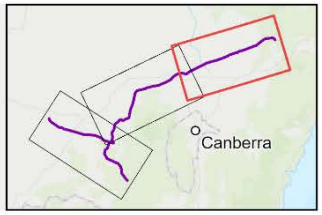
Amended project footprint
Potential controlled blasting area
National park and reserve
State forest
Waterway
Major road
Railway
Substation



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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0 7 14 km

Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 3-8c: Overview of indicative controlled blasting locations

3.8. Use of approved water sources

3.8.1. EIS description

Section 4.5.2 of the EIS detailed the indicative water volumes for constructing the EIS project and generally described the water sources to be used depending on the location and nature of the construction activity and whether potable or non-potable water is required.

Water sources proposed included:

- construction sedimentation basins
- farm dams
- rainwater tanks
- council standpipes or connection to council water supply systems
- groundwater bores
- purchase of water allocations from existing water users.

Section 4.5.2 of the EIS discussed that the preference for sourcing non-potable water was to use surface water from construction sedimentation basins and farm dams in agreement with the relevant landowners. However, it was acknowledged that the temporary purchase of existing water user allocations would be required to meet all non-potable requirements, which was further discussed in *Technical Report 12 – Surface Water and Groundwater Impact Assessment* of the EIS.

Potable water for the EIS project was to be sourced from council standpipes via water carts and taken to the construction compounds, or from council water supply systems, as required.

3.8.2. Refinement description

Based on further construction planning and design development (including the amendments and refinements discussed in this chapter), the indicative water volumes required for construction have been refined for the amended project, as detailed in Table 3-6.

Table 3-6 Indicative water volumes for construction of the amended project

Activity	EIS project	Amended project	Source
Dust suppression and civil work	496.5 ML	428.1 ML	Preferably non-potable
Concrete batching	23.4 ML	77.9 ML	Potable
Equipment and vehicle washdown	1.1 ML	1.1 ML	Non-potable
General worker facilities	43.8 ML	208 ML	Potable
Total	**564.8 ML**	**715.1 ML**	**-**

Based on the increase in water demand during the construction of the amended project and feedback from the Water Group of NSW Department of Climate Change, Energy, the Environment and Water (Water Group of NSW DCCEEW) in their submission to the EIS, further analysis of water sources has been carried out. The water source analysis complements the analysis carried out for water sources in *Technical Report 12 – Surface Water and Groundwater Impact Assessment* of the EIS.

While the proposed water sources for the EIS project generally remain applicable to the amended project, the further analysis of water sources has resulted in development of a decision-making process and recommended order for selecting the water sources during construction. The recommended order for use

of non-potable and potable water sources is provided below, noting however that in some geographic areas the reliability/feasibility of available options would ultimately dictate the water source selected. *Technical Report 12 – Surface Water and Groundwater Impact Assessment Addendum* provides the approach undertaken and detailed outcomes of the further analysis.

Technical Report 16 – Revised Traffic and Transport Impact Assessment provides the traffic and transport impact assessment for the use of approved water sources from the source to the amended project footprint based on a revised water supply strategy. The roads providing the access from potable and non-potable water supply options to the amended project footprint have also been included in the amended traffic study area.

3.8.2.1. Non-potable water sources

During construction, non-potable water would be used for equipment and vehicle washdown, and preferably for dust suppression and civil work. A combination of water sources would likely be required to meet the total non-potable water demand. Based on achieving construction efficiencies, the investigations of the sources of non-potable water for construction were limited to within five kilometres of the amended project footprint. The various non-potable water sources would include:

- Sediment basins/farm dams/wastewater/rainwater tanks.
- Groundwater (from existing licensed extraction bores) – 63 licensed bores with licensed extraction volume information available have been identified within five kilometres of the amended project footprint, which may be able to be used as a source of non-potable water, subject to agreement with existing water users and the provisions of existing approvals under the *Water Management Act 2000* (WM Act).
- Surface waterways (purchasing water from existing user allocations from existing extraction points) – 22 waterways have been identified that intersect with the amended project footprint, which could be used as a source of non-potable water subject to agreement with existing water users and the provisions of existing approvals under the WM Act.

The feasibility of each of these sources would be confirmed as part of further detailed design and construction planning.

3.8.2.2. Potable water sources

During construction, potable water would be used for the combined worker accommodation facilities and construction compounds, and for concrete batching. Potable water would only be used for dust suppression if there is no other option available. Similar to non-potable water demand, a combination of water sources would likely be required to meet the total potable water demand. The various potable water sources are outlined in recommended order below:

(a) direct connection to council water reticulation system

(b) transported from nearby town/s via water cart/tanker

(c) purchased from third party commercial supplier(s)

(d) on-site water treatment systems in conjunction with non-potable sources outlined above.

3.9. Use of helicopters and drones

3.9.1. EIS description

Section 4.3.2.2 of the EIS described that helicopters may be used to deliver materials and equipment and to transfer personnel to construction areas, particularly within high alpine regions. The EIS also described that helicopters may be used for stringing of the transmission lines with the details to be determined during detailed design. Options for potential helipad locations within construction compounds were identified for the EIS project, with the exact locations to be used confirmed during detailed design.

In addition, Section 4.2.2.1 of the EIS identified using drones as an alternative to helicopters for stringing of transmission lines.

3.9.2. Refinement description

Following further design development and construction planning, the construction contractors have identified a number of opportunities for the use of helicopters and drones, including for the stringing of the transmission lines. The use of helicopters and drones during stringing may be beneficial in reducing vegetation clearing and reducing the duration of this activity. However, the use of helicopters for stringing is subject to meeting all Transgrid's health and safety requirements. In addition, drones are also expected to be used for additional construction activities such as, but not limited to, aerial surveys and vegetation management.

Figure 3-9 provides an indicative diagram of how helicopters and drones would be used during the stringing of the transmission lines.

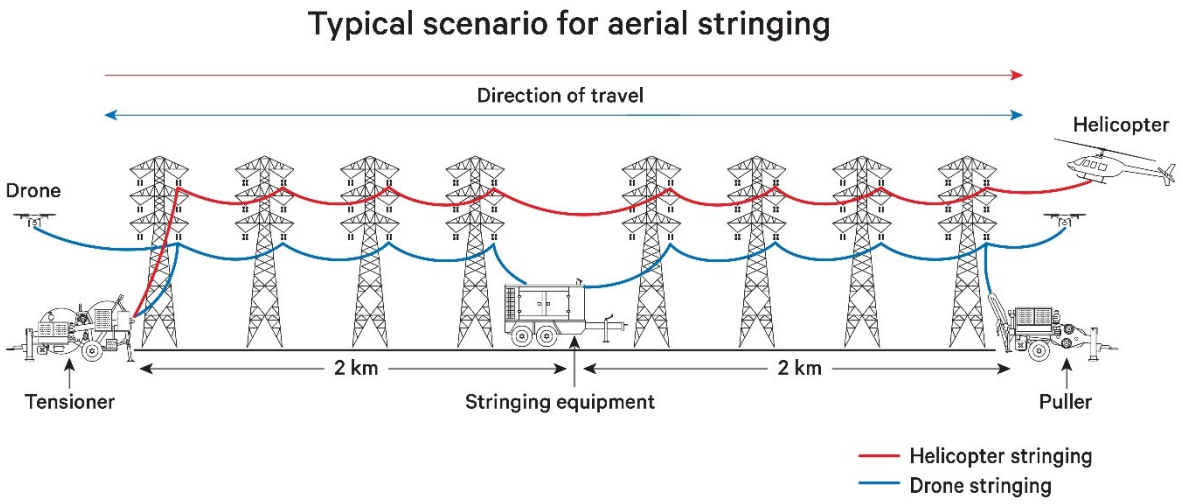


Figure 3-9 Diagram of how the transmission line would be strung using helicopters and drones

The proposed changes to ancillary facilities (refer to Section 3.3) include potential helipad locations for the amended project (refer to Table 3-7). Helicopters may also be based overnight at airports, including Goulburn, Wagga Wagga, and Tumut.

Table 3-7 Potential helipad locations for the amended project

Ancillary facility	Potential Helipad	
	Identified for EIS project	Identified for amended project
Wagga 330 kV substation compound (C01)	No	No
Maragle 500 kV substation compound (C05)	Yes	Yes
Amended Gregadoo Road compound (C06)	No	**Yes**
Amended Honeysuckle Road compound (C07)	Yes	Yes
Yass substation compound (C10)	No	No
Amended Bannaby 500 kV substation compound (C12)	Yes	Yes
Amended Memorial Avenue compound (C14)	No	**Yes**
Ardrossan Headquarters Road compound (C17)	N/A	**Yes**
Snubba Road compound (C18)	N/A	**Yes**
Gadara Road compound (C19)	N/A	**Yes**
Ellerslie Road compound (C21)	N/A	**Yes**
Tarcutta accommodation facility and compound (AC03)	N/A	**Yes**
Adjungbilly accommodation facility and compound (AC04)	N/A	**Yes**
Yass accommodation facility and compound (AC05)	N/A	**Yes**
Crookwell accommodation facility and compound (AC06)	N/A	**Yes**
Green Hills accommodation facility and compound (AC07)	N/A	**Yes**

Note: Bolded where changed compared to the EIS

4. Statutory context

The planning and statutory requirements for the project, and other NSW and Commonwealth legislation and approvals which may apply, are detailed in Chapter 5 (Statutory context) of the EIS. This chapter provides an overview of the statutory context for the amended project and provides a summary of the additional statutory requirements as a result of the amendments and refinements.

4.1. NSW assessment and approval process

As described in Chapter 5 (Statutory context) of the EIS, the NSW Minister for Planning and Public Spaces has declared the project to be Critical State Significant Infrastructure (CSSI) under Section 5.13 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and by amendment to Schedule 5, clause 9 of the State Environmental Planning Policy (Planning Systems) 2021. As CSSI, the project requires approval from the NSW Minister for Planning under Part 5, Division 5.2 of the EP&A Act.

An EIS has been prepared to support Transgrid's application for approval of the project in accordance with the requirements of Division 5.2 of the EP&A Act and clause 191 of the NSW Environmental Planning and Assessment Regulation 2021 (EP&A Regulation). The EIS was placed on public exhibition for a period of 42 days, commencing 30 August 2023 and concluding on 10 October 2023. During the public exhibition period, interested stakeholders and members of the community were able to review the EIS online or at display locations, participate in consultation and engagement activities and make a written submission to the NSW Department of Planning, Housing and Infrastructure (DPHI) (formerly the NSW Department of Planning and Environment (DPE)) for consideration in its assessment of the project.

In accordance with clause 179(2) of the EP&A Regulation, an application may, with the approval of the Planning Secretary, be amended at any time before the application is determined. Transgrid is proposing amendments and refinements to the project described in the EIS to reflect changes proposed as a result of further design and construction planning and in response to community and stakeholder feedback.

This Amendment Report has been prepared in accordance with Sections 179(2) and 179(3) of the EP&A Regulation.

The assessment and approval requirements of the project under the EP&A Act, including pre-conditions to exercising the power to grant approval and mandatory matters for consideration by the NSW and Commonwealth Ministers in deciding whether to grant approval, are described in Chapter 5 (Statutory context) of the EIS, with supplementary information provided in this chapter. An updated statutory compliance table for the amended project is provided in Appendix C of this Amendment Report. The statutory context has not changed since the EIS was submitted as the amendments and refinements do not trigger any new statutory requirements. Despite this, Appendix C has been updated to include additional statutory considerations as suggested in submissions raised on the EIS.

The assessment and approval process under Division 5.2 of the EP&A Act and where the project is in this process is illustrated in Figure 4-1.

4.2. Commonwealth and assessment process

A referral was submitted in December 2021 (EPBC referral number 2021/9121) in accordance with the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW).

On 13 April 2022, the project was determined to be a controlled action and as such would require approval from the Commonwealth Minister for the Environment and Water under Part 9 of the EPBC Act. In May 2022, Supplementary SEARs were issued confirming the action would be subject to the Assessment Bilateral Agreement between the Commonwealth of Australia and the State of NSW.

Following the public exhibition of the EIS, a request to vary a proposed action in accordance with the EPBC Act is required for the amended project as a result of changes to the project that was originally referred in December 2021. This was due to the proposed transmission line corridor changes associated with the Green Hills corridor amendment (refer to Chapter 3 (Description of the amended project)) which is outside the previous EPBC referral area. In accordance with Part 11, Division 1A of the EPBC Act and Division 5.4 of the Environment Protection and Biodiversity Conservation Regulations 2000, a proponent can request the Minister to accept a variation of the proposal from that described in the original referral (formally referred to as a request to vary the proposal to take an action). In accordance with this, a variation request was submitted to the Commonwealth DCCEEW.

This Amendment Report would be provided to the Commonwealth DCCEEW as part of the package of information to allow them to make their determination regarding the project under the requirements of the EPBC Act.

An overview of both the NSW and Commonwealth planning approvals process and current status of the project within this process is shown in Figure 4-1.

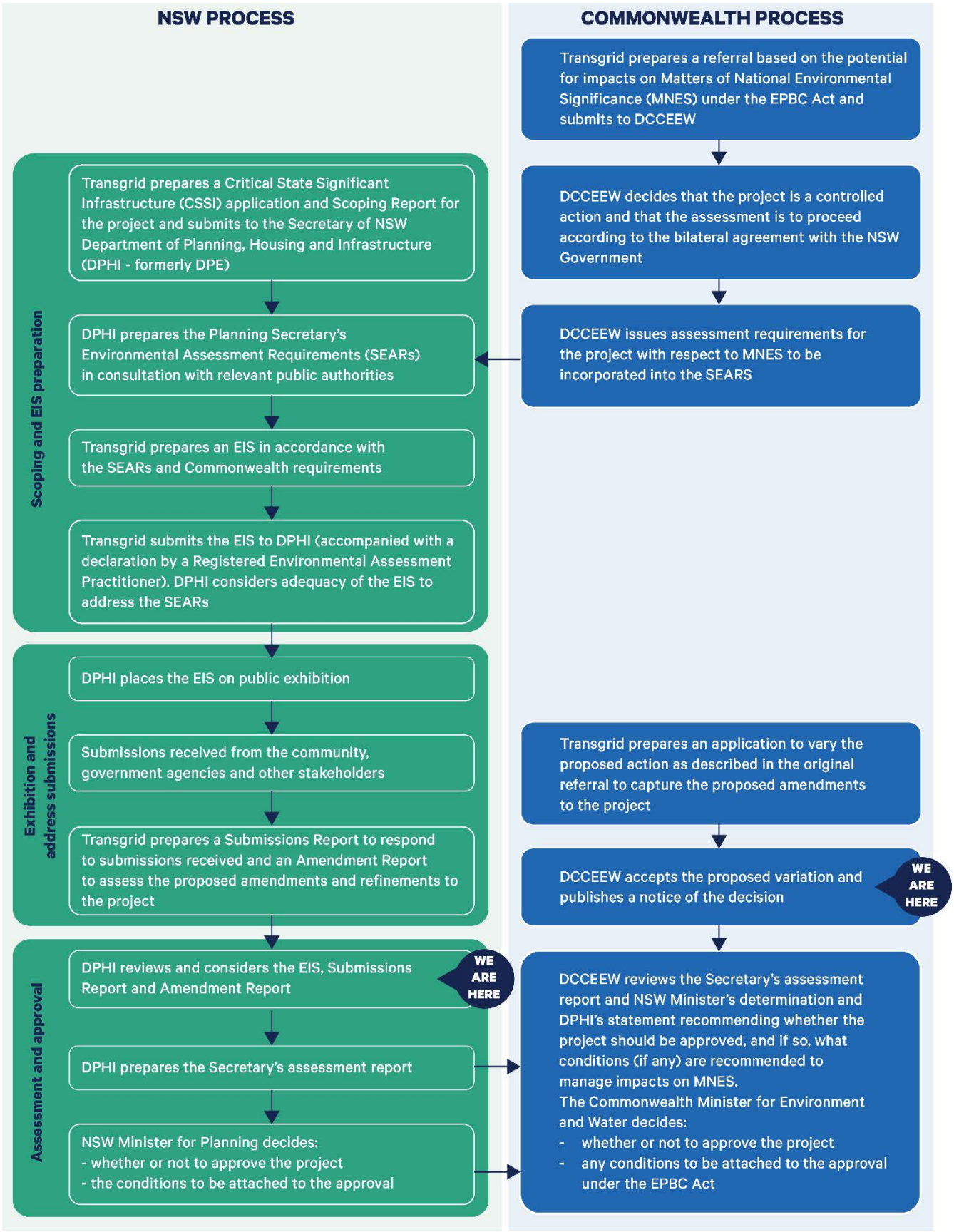


Figure 4-1 Planning approvals process for the amended project

5. Engagement

The Amendment Report includes design refinements from the project team, as well as a number of changes as a result of community and stakeholder feedback on the EIS. This chapter outlines the ongoing engagement activities undertaken during the development of this Amendment Report. It demonstrates how communities and stakeholders have been provided opportunities to give feedback on the proposed project amendments and refinements.

Engagement has formed an integral part of the project's development and has provided communities and stakeholders the opportunity to understand, question and put forward their viewpoints. Transgrid developed a detailed engagement plan to identify relevant stakeholder groups, including newly identified stakeholders as a result of the proposed amendments and refinements, and the most appropriate method(s) of engagement.

5.1. Engagement for the proposed amendments and refinements

Engagement for the amended project has included consultation with relevant local, State and Commonwealth government authorities, service providers, community groups, directly impacted landowners, Native Title holders and mineral and exploration title holders to ensure a strategic and comprehensive engagement strategy and to comply with the Planning Secretary's environmental assessment requirements (SEARs). As a result of the proposed amendments and refinements and in consideration of the amended project footprint, several additional stakeholders were identified as potentially impacted by the project. The targeted engagement strategy included:

- searches of the Native Title Register and Register of Native Title Claims, which did not identify any Crown land areas within the amended project footprint as being the subject of a claim of determination under the *Native Title Act 1993*
- searches of the Register of Aboriginal Land Claims, with Transgrid engaging with the NSW Aboriginal Land Council for any undetermined land claims
- ongoing consultation with exploration licence and mineral title holders across the amended project footprint
- ongoing briefings and information sharing with local, State and Commonwealth Government authorities, with the identification of Goulburn Mulwaree LGA as part of the amended project footprint, in addition to the five previously identified LGAs (Wagga Wagga City, Snowy Valleys, Yass Valley, Cootamundra-Gundagai and Upper Lachlan Shire)
- engagement with easement affected landowners and near neighbours on the proposed amendments and refinements
- street meetings, as well as more formal face-to-face and online information sessions.

Sections 5.1.1 to 5.1.5 provide an overview of the targeted engagement approach taken to support the proposed amendments and refinements. Further detail on community and stakeholder engagement activities undertaken during the development of this Amendment Report are outlined in Appendix D (Engagement Outcomes Report), including engagement with newly identified stakeholders as a result of the proposed amendments and refinements. Section 4.1 of Appendix D outlines the engagement approach that ensured community and stakeholder feedback was sought and considered as part of the proposed amendments and refinements. Section 5 of Appendix D provides information on the engagement activities undertaken as well as the feedback received. Section 5.2 of Appendix D provides more on the feedback from Transgrid's engagement with local Members of Parliament, Commonwealth and State Government

departments and agencies, local councils, Aboriginal stakeholders, Community Consultative Group (CCG), exploration license and mineral title holders and quarry operators, landowners, near-neighbours and community members. Feedback and topics raised are categorised according to the Amendment Report items with information on where these are addressed in the Amendment Report.

For more information on the broader consultation and stakeholder engagement undertaken for the project, refer to Chapter 6 (Engagement) and Appendix C (Engagement Outcomes Report) of the Environmental Impact Statement (EIS), and Chapter 2 (Engagement) of the Submissions Report.

Figure 5-1 provides an overview of engagement activities during the development of this Amendment Report, ie between October 2023 and April 2024.

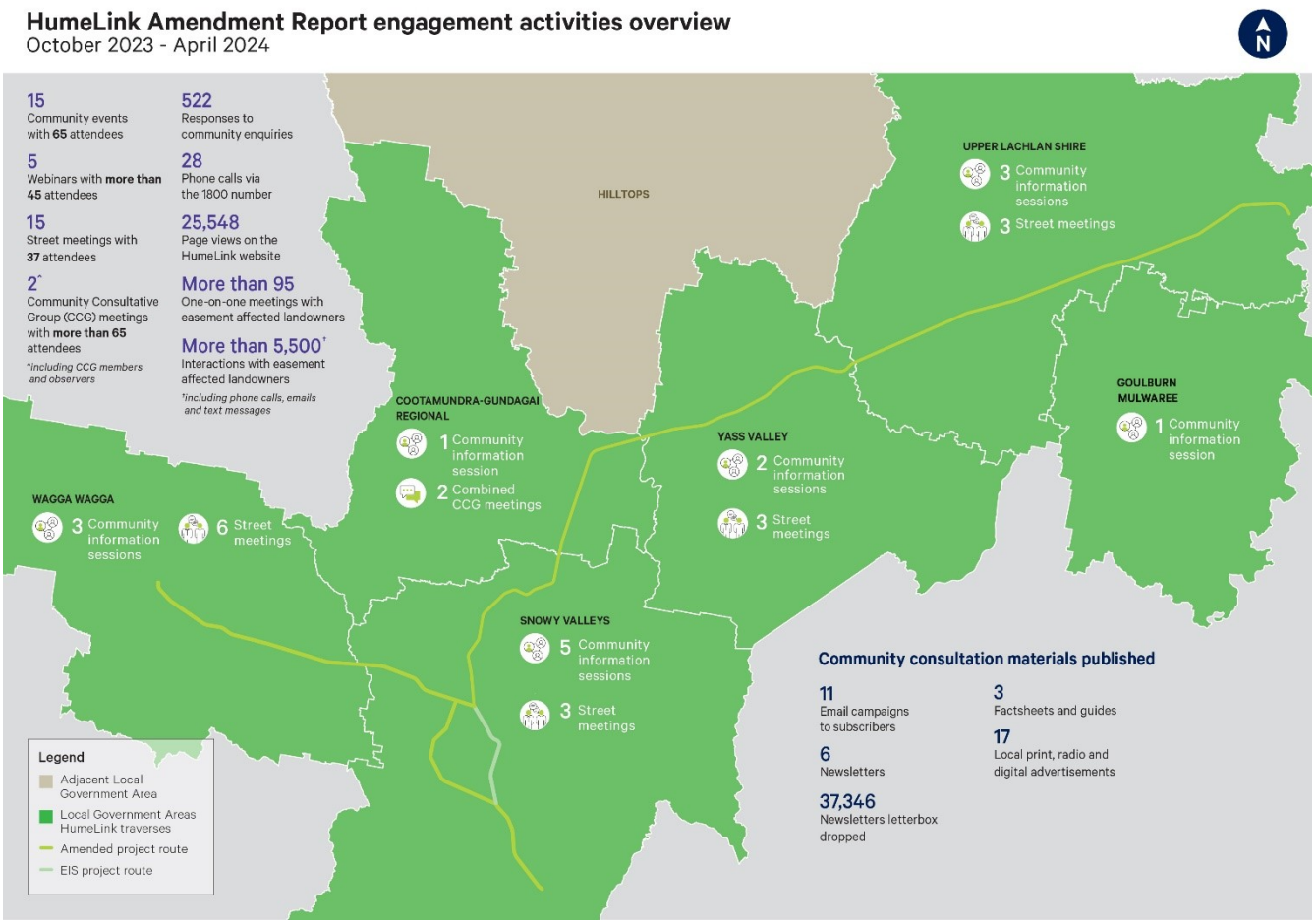


Figure 5-1 Overview of Amendment Report engagement activities from October 2023 to April 2024

5.1.1. The Green Hills corridor amendment

As part of Transgrid's route selection process, technical and environmental information is collected and assessed. Transgrid also consults with landowners, local community groups and Aboriginal groups to incorporate their feedback, knowledge and concerns into the assessments to inform the route selection.

As a result of landowner, community and stakeholder feedback and engagement with Forestry Corporation of NSW (FCNSW), Transgrid committed to investigate the feasibility of a western route through Green Hills State Forest. This commitment was noted in the EIS. As a result, Transgrid has adopted an alternative

alignment for the transmission line corridor between Wondalga and the future Maragle 500 kV substation through the Green Hills State Forest. The Green Hills corridor amendment is detailed in Chapter 3 (Description of the amended project).

A communication and stakeholder engagement plan for the proposed corridor amendment included phone calls and letters (with maps) to the previously impacted landowners to inform them they would no longer be impacted. This plan also included communications with newly impacted stakeholders along the Green Hills corridor. Dedicated place managers and land access officers also discussed the changes face to face with each landowner.

Transgrid also directly engaged with a range of Government agencies and Councils regarding the proposed Green Hills corridor amendment, including:

- Commonwealth Department of Climate Change, Energy, the Environment and Water (Commonwealth DCCEEW)
- NSW Department of Climate Change, Energy, the Environment and Water – Environment and Heritage (NSW DCCEEW Environment and Heritage)
- NSW Department of Climate Change, Energy, the Environment and Water – Water (NSW DCCEEW Water)
- Heritage Council of NSW
- Department of Planning, Housing and Infrastructure – Crown Lands (DPHI Crown Lands)
- NSW Rural Fire Service
- NSW Department of Primary Industries – Agriculture (NSW DPI – Agriculture)
- NSW Department of Primary Industries – Fisheries (NSW DPI – Fisheries)
- Transport for NSW (TfNSW)
- NSW Environment Protection Authority (EPA)
- Snowy Valleys Council.

Transgrid also continued to communicate the proposed Green Hills corridor amendment through the Community Consultative Group (CCG) briefings, government agency and local council briefings and through general project communications including website updates with maps, newsletters and a two-page Green Hills corridor amendment fact sheet.

The Green Hills corridor amendment, including bushfire risk across Forestry land and the route selection process, was also discussed during in-person community information sessions in February 2024, with particular interest shown at the sessions in Gunning, Yass, Gundagai, Batlow and Adelong.

Engagement with Local Aboriginal Land Councils (LALCs) and Registered Aboriginal Parties (RAPs) was also undertaken as part of the proposed changes to the transmission line corridor including the Green Hills corridor amendment. The engagement was undertaken with previously identified LALCs and RAPs as part of the Aboriginal engagement completed for the EIS. Refer to Technical Report 2 – Revised Aboriginal Cultural Heritage Assessment Report for further detail on consultation with Aboriginal groups through LALCs and RAPs.

5.1.2. Changes to worker accommodation facilities and construction compounds

As described in Chapter 3 (Description of the amended project), five temporary combined worker accommodation facilities and construction compounds are proposed at Tarcutta, Green Hills, Yass, Adjungbilly and Crookwell, as well as 11 standalone construction compounds. Some of the construction compounds included in the amended project footprint were previously considered in the EIS.

The proposed amendment is the direct result of engagement with local councils, construction contractors, community feedback and submissions made during the public exhibition of the EIS.

The following engagement activities were undertaken to support the proposed changes to worker accommodation facilities and construction compounds:

- one-on-one commercial negotiations between directly impacted landowners and their dedicated place managers and land access officers
- government agency briefings with Commonwealth DCCEEW, NSW DCCEEW Environment and Heritage, NSW DCCEEW Water, Heritage Council of NSW, FCNSW, NSW Rural Fire Service, NSW DPI – Agriculture, NSW DPI – Fisheries, TfNSW, NSW EPA, NSW Telco Authority
- local council briefings with Yass Valley Council, Goulburn Mulwaree Council, Cootamundra-Gundagai Regional Council, Snowy Valleys Council, Upper Lachlan Shire Council, Wagga Wagga City Council and Hilltops Council
- engagement with adjacent landowners (referred to as “near neighbours”) to the proposed ancillary facilities via the Remote Access Community Hub (RACH) for meetings on request and informal drop-in street meetings, as well as direct engagement via in-person meetings or phone calls
- engagement with the broader community, with particular focus on the communities nearby to the proposed worker accommodation facilities (ie Tarcutta, Batlow, Gundagai, Crookwell and Yass), via advertised webinars and in-person community information sessions along the project route
- online meetings with key stakeholders including local councils, business chambers and groups, and communities to support the development of *Technical Report 7 - Social Impact Assessment Addendum*.

Councils within the amended project footprint have been briefed on the information on the proposed amendment to worker accommodation facilities and construction compounds during briefings. Topics discussed at the briefings included locations, worker capacity, features, service utility connections, traffic plans and potential social and economic benefits.

Community members who attended the community information sessions, street meetings and webinars have also provided comments and feedback on the amendments to the proposed construction ancillary facilities. Key themes raised included capacity of each proposed accommodation facility, construction compound features, traffic management and local business opportunities. Additional details on key topics and themes raised by community and stakeholders are outlined in Appendix D (Engagement Outcomes Report).

5.1.3. Nomination of access tracks

As part of Transgrid’s engagement approach, dedicated place managers and land access officers have continued to liaise with directly impacted landowners about the nominated new and existing access tracks to connect construction areas to the current road network.

Access tracks and access requirements are discussed and agreed with landowners on an individual basis and documented as part of the property management plans. The location of new access tracks has generally been selected in consultation with affected landowners to minimise property impacts, including running the track along fence lines, using movement paths preferred by landowners, and using existing property gates.

The requirements to retain or reinstate access tracks will be determined in consultation with landowners during property negotiations and ahead of the commencement of operation. Transgrid will continue to work with landowners to determine the post-construction condition of access tracks. All requirements will be documented within the property-specific property management plans or as otherwise agreed with the landowner.

Nominated access tracks have been discussed in briefings with:

- government agencies including NSW DCCEEW Environment and Heritage, Heritage Council of NSW, NSW DPI – Agriculture, NSW DPI – Fisheries, TfNSW, FCNSW, NSW EPA, NSW Telco Authority and NSW Rural Fire Service
- local council briefings with Yass Valley Council, Goulburn Mulwaree Council, Cootamundra-Gundagai Regional Council, Snowy Valleys Council, Upper Lachlan Shire Council, Wagga Wagga City Council and Hilltops Council
- engagement with the broader community via advertised webinars and in-person community information sessions along the project route.

Refer to Appendix D (Engagement Outcomes Report) for summary of feedback received.

5.1.4. Additional telecommunications connections to existing substations

Removal of the telecommunications hut at Killimicat, as presented in the EIS, and the inclusion of additional telecommunications connections are proposed as part of the amended project.

Engagement to support this proposed amendment has included briefings to government agencies including the NSW Telco Authority, as well as relevant local councils. Engagement has also included ongoing communication including letters, phone calls and face-to-face meetings between relevant landowners and their dedicated place managers and land access officers. Landowners include those:

- adjacent to the proposed locations for the telecommunications connections (ie Gadara 132 kV substation, Gullen Range 330 kV substation and Crookwell 2 330 kV substation)
- near the previously proposed telecommunications hut at Killimicat.

Refer to Appendix D (Engagement Outcomes Report) for summary of feedback received.

5.1.5. Refinements

Transgrid has identified several refinements to provide functional improvements to the design and construction methodology of the amended project (refer to Chapter 3 (Description of the amended project)).

Engagement for these refinements (including the transmission line and substation design refinements at Gregadoo, identification of areas where controlled blasting may be required, use of approved water sources, and use of helicopters and drones) has included:

- one-on-one engagement with easement affected landowners along the proposed transmission line route led by place managers and land access officers
- government agency and local council briefings
- engagement with near neighbours and the broader community via advertised webinars and in-person community information sessions along the project route
- website updates including newsletters, the 'Gugaa substation' fact sheet and the 'Construction' fact sheet.

Refer to Appendix D (Engagement Outcomes Report) for a summary of the feedback received.

5.2. Engagement with Aboriginal Land Councils and Registered Aboriginal Parties

Engagement with Local Aboriginal Land Councils (LALCs) and Registered Aboriginal Parties (RAPs) was also undertaken as part of the development of the Amendment Report including the Green Hills corridor amendment. Refer to *Technical Report 2 – Revised Aboriginal Cultural Heritage Assessment Report* for further detail on consultation with Aboriginal groups through LALCs and RAPs.

Transgrid has undertaken updated searches of the National Native Title Register and Register of Native Title Claims, administered by the National Native Title Tribunal to support the Amendment Report. Details on the outcomes of these updated searches are provided in Section 6.3.

Transgrid will work with the relevant LALCs and the NSW Aboriginal Land Council (NSW ALC) to reach an agreement about remaining undetermined land claims affected by the project. Refer to Appendix D (Engagement Outcomes Report) for further detail on ongoing and future engagement with the relevant LALCs and the NSW ALC.

5.3. Engagement to be carried out if the amended project is approved

Transgrid will continue to engage with key stakeholders, councils, government agencies, landowners, near neighbours and the community along the HumeLink project between the lodgement of this Amendment Report and project approval, and then ongoing throughout construction. Although the formal engagement as part of the planning approval process will be complete, both Transgrid and our construction contractors will continue to consult and work closely with landowners, community and councils on the detail of local impacts, use of local infrastructure and investment in local communities.

For up-to-date information on upcoming engagement activities, please visit the HumeLink website.

Engagement will continue throughout construction and operation of HumeLink (subject to project approval) as per the approach presented in Chapter 6 (Engagement) of the EIS.

Ongoing engagement aims to:

- ensure a continued high level of community awareness
- provide opportunities for ongoing community feedback and community investment
- ensure feedback or concerns are addressed in a timely manner with accurate information.

Transgrid continues to work closely with its construction contractors in relation to community and stakeholder engagement and management, workforce and workforce development, local industry participation, Aboriginal participation, and community investment and benefits. The approach to community and stakeholder engagement during construction of the amended project will be outlined in the Community and Stakeholder Engagement Management Plan (CSEMP), which will be prepared by the construction contractors and finalised before construction begins. Transgrid will evaluate and endorse the CSEMP in consideration of any relevant Minister's conditions of approval.

The approach to community and stakeholder engagement during construction would include a feedback procedure to manage enquiries, complaints and disputes. The HumeLink project hotline (1800 317 367), email address (humelink@transgrid.com.au) and webpage (https://www.transgrid.com.au/projects-innovation/humelink) will continue to be available, monitored and updated. Impacted landowners within the amended project footprint and other key stakeholders will receive important information directly via the channels and materials outlined in the CSEMP.

6. Assessment of impacts

This chapter provides a summary of the additional assessments undertaken to assess the proposed amendments and refinements to the project. These additional assessments have been carried out to identify and assess the potential construction, operational and cumulative impacts, focusing on potential changes to the expected impacts identified in the Environmental Impact Statement (EIS) as a result of the amendments and refinements to the project discussed in Chapter 3 (Description of the amended project). Where required, additional or revised environmental mitigation measures have been proposed.

6.1. Overarching assessment approach

Part B (Environmental assessment) of the EIS provided an assessment of the key environmental issues for the project as identified in the Planning Secretary's Environmental Assessment Requirements (SEARs). The approach adopted for these assessments is described in Sections 8.2 to 25.2 (Assessment approach) of the EIS.

The amended project, as described in Chapter 3 (Description of the amended project), was assessed against each of the key issues as set out in the SEARs issued for the project on 14 March 2022 by the Secretary of the NSW Department of Planning, Housing and Infrastructure (DPHI) (formerly the Department of Planning and Environment) and, supplementary SEARs in May 2022, which provided additional requirements from Commonwealth Department of Climate Change, Energy, the Environment and Water (Commonwealth DCCEEW). No additional or updated SEARs were issued by DPHI and this Amendment Report and its appendices have therefore been prepared in accordance with the SEARs previously issued for the project.

A screening assessment of the potential environmental impacts of each of the proposed amendments and refinements was undertaken as part of scoping the Amendment Report. This included consideration of environmental, social and economic issues and a screening assessment of the potential changes to the impacts compared to those described in the EIS. Where no material change in impact was identified, this aspect was not considered further as part of the assessment of each of the proposed amendments and refinements. No new environmental issues were identified during the screening assessment for the amendments and refinements.

The screening assessment summary of the aspects potentially affected by each of the proposed amendments and refinements is provided in Table 6-1. Where additional assessment has been identified to be required, these are marked in green. Where there are no changes to the impacts assessed in the EIS, these are marked in red, and no further assessment has been undertaken as part of this Amendment Report.

The following technical reports were prepared to support this Amendment Report:

- *Technical Report 1 – Revised Biodiversity Development Assessment Report* (Niche, 2024)
- *Technical Report 2 – Revised Aboriginal Cultural Heritage Assessment Report* (Navin Officer Heritage Consultants, 2024a)
- *Technical Report 3 – Historic Heritage Impact Assessment Addendum* (Navin Officer Heritage Consultants, 2024b)
- *Technical Report 4 – Agricultural Impact Assessment Addendum* (Tremain Ivey Advisory, 2024a)
- *Technical Report 7 – Social Impact Assessment Addendum* (HillPDA, 2024a)

- *Technical Report 8 – Landscape Character and Visual Impact Assessment Addendum* (IRIS, 2024)
- *Technical Report 9 – Noise and Vibration Impact Assessment Addendum* (SLR, 2024a)
- *Technical Report 10 – Phase 1 Contamination Assessment Addendum* (Aurecon, 2024b)
- *Technical Report 11 – Hydrology and Flooding Impact Assessment Addendum* (Aurecon, 2024c)
- *Technical Report 12 – Surface Water and Groundwater Impact Assessment Addendum* (Aurecon, 2024d)
- *Technical Report 13 – Bushfire Risk Assessment Report Addendum* (Aurecon, 2024e)
- *Technical Report 16 – Revised Traffic and Transport Impact Assessment* (Aurecon, 2024f)
- *Technical Report 17 – Air Quality Impact Assessment Addendum* (SLR, 2024b).

Note: Numbering of technical reports remain as per the EIS for consistency, however no addendum reports were required for land use and property, economic, aviation, electric and magnetic fields or greenhouse gas.

Addendum technical reports have assessed the amendments and refinements of the project and should be read in conjunction with the technical reports prepared for the EIS for impacts associated with the amended project as a whole. Summaries of the addendum technical reports presented within this chapter are therefore for the amendments and refinements only.

Revised technical reports have been prepared where the project amendments and refinements were unable to be assessed in isolation, due to the broader scale and nature of changes to the assessment and/or where an assessment had legislative/guideline requirements relating to assessment report structure. A revised technical report supersedes the technical report prepared for the EIS and addresses potential impacts of the amended project as a whole rather than the amendments and refinements in isolation. Revised technical reports included in the Amendment Report are biodiversity, Aboriginal heritage and traffic and transport. Summaries of revised technical reports presented within this chapter, however only include any relevant updates to the assessment approach and provide details of the impacts of the amended project.

Potential impacts would be managed in accordance with the updated environmental mitigation measures included in Appendix B (Updated mitigation measures).

Table 6-1 Screening assessment for proposed amendments and refinements

	Biodiversity	Aboriginal heritage	Non-Aboriginal heritage	Land use and property	Economic	Social	Landscape character and visual amenity	Noise and vibration	Soils, geology, and contamination	Surface water and groundwater quality	Hydrology and flooding	Hazards and risks	Traffic, transport and access	Air quality	Climate change and greenhouse gas	Waste	Sustainability	Cumulative
Amendments																		
Changes to the transmission line corridor																		
Changes to the number and location of construction ancillary facilities, including worker accommodation facilities and construction compounds																		
Nomination of access tracks																		
Additional telecommunications connections to existing substations																		
Refinements																		
Transmission line and substation design at Gregadoo																		
Identification of areas where controlled blasting may be required																		
Use of approved water sources																		
Use of helicopters and drones																		

Note: Green indicates additional assessment is required to be undertaken and red indicates no further assessment is required.

6.2. Biodiversity

6.2.1. Approach to assessment

Technical Report 1 – Revised Biodiversity Development Assessment Report provides the biodiversity assessment approach and methodology for the amended project and assesses the proposed amendments and refinements described in Chapter 3 (Description of the amended project). The revised assessment also addresses detailed feedback and issues raised in the submissions on the EIS from the NSW Department of Climate Change, Energy, the Environment and Water – Environment and Heritage (NSW DCCEEW Environment and Heritage), Department of Primary Industries – Fisheries (DPI Fisheries) and the community. Appendix C (NSW Department of Climate Change, Energy, the Environment and Water – Environment and Heritage detailed response) of the Submissions Report provides details on how feedback has been considered in the revised assessment.

The legislative and policy context and methodology for assessing the amended project is presented in *Technical Report 1 – Revised Biodiversity Development Assessment Report*. The revised assessment involved (in addition to the assessment and fieldwork undertaken for *Technical Report 1 – Biodiversity Development Assessment Report* of the EIS):

- a review of available data and existing reports relevant to existing vegetation, threatened flora and threatened fauna of the amended project footprint, including searches of the NSW BioNet Atlas Database and the EPBC Act Protected Matters Search Tool of the locality (ie a 10-kilometre buffer around the amended project footprint)
- a review and confirmation of candidate threatened flora and fauna species from the Biodiversity Assessment Method Credit Calculator (BAM-C) based on the amended project footprint
- additional flora and fauna surveys between September 2023 and March 2024 within accessible lands
- preparation and consideration of expert reports for Striped Legless Lizard (*Delma impar*), Key's Matchstick Grasshopper (*Keyacris scurra*) and owls and raptors
- consideration of additional ecological information and spatial data provided by NSW DCCEEW Environment and Heritage, Forestry Corporation of NSW, and Orchid Society of Canberra Conservation Group
- additional aquatic habitat desktop assessment and inspection.

Since the public exhibition of the EIS, an additional 1,873.04 hectares have been surveyed, which includes new areas of the amended project footprint and areas of the EIS project footprint that were previously inaccessible. As such, the total survey coverage of the amended project footprint is around 79 per cent compared to around 67 per cent for the EIS project footprint.

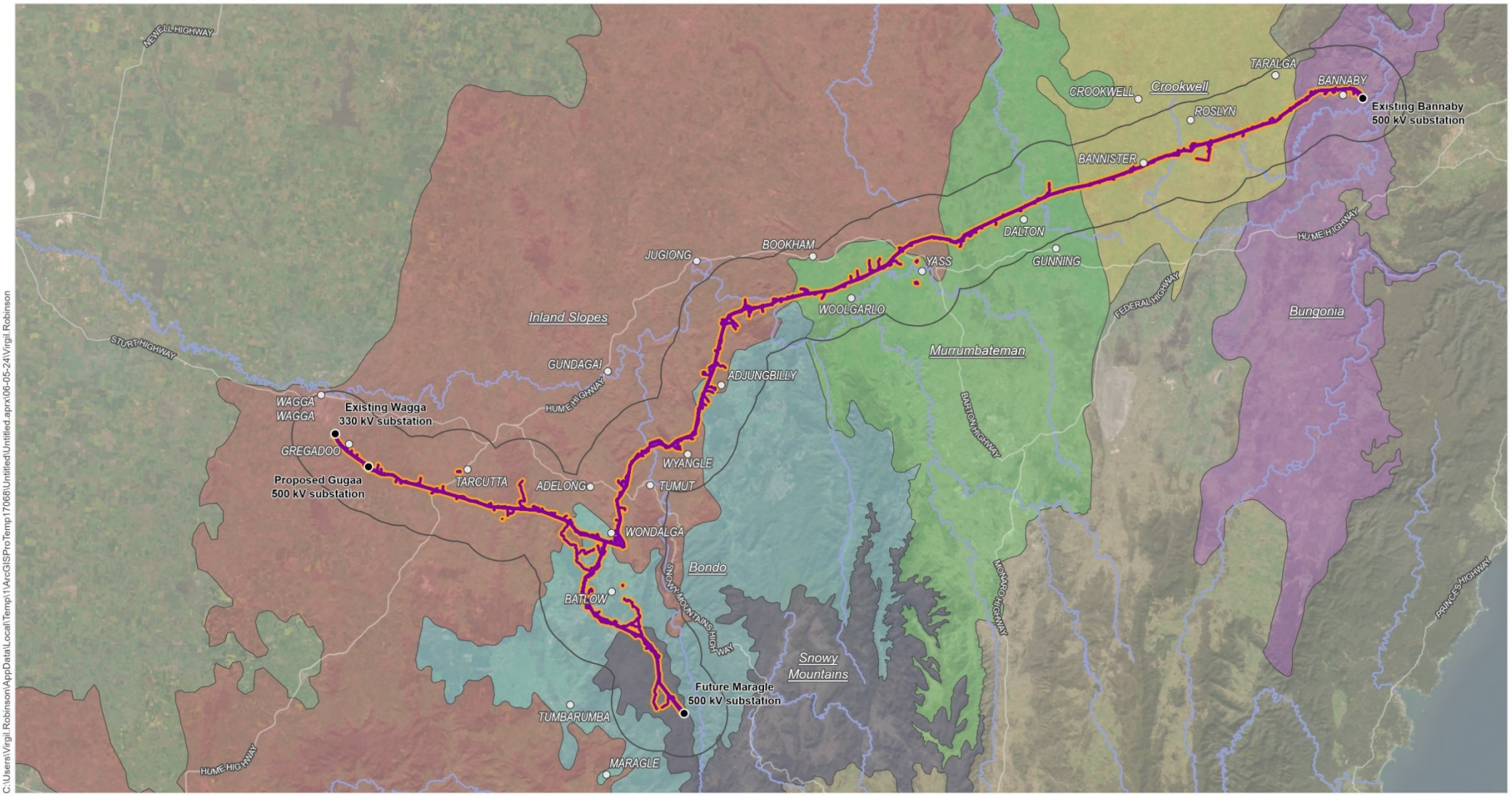
The largest section of inaccessible land remaining is located within the Inland Slopes Interim Biogeographic Regionalisation for Australia (IBRA) subregion, where approximately 11 kilometres of the amended project footprint length could not be accessed. As part of *Technical Report 1 – Revised Biodiversity Development Assessment Report*, supplementary approaches have been applied to address information and data gaps within inaccessible land or other lands where survey effort was insufficient to meet guideline requirements. This included assumed presence based on habitat suitability and engagement of species experts.

Further surveys and assessments of severely burnt vegetation, in accordance with the *Guideline for Applying the Biodiversity Assessment Method at Severely Burnt Sites* (DPIE, 2020a) have been carried out for the amended project. This has also considered advice and recommendations from NSW DCCEEW Environment and Heritage provided following the public exhibition of the EIS. While the response of flora

and fauna to bushfires is highly variable depending on species, substantial vegetation recovery has continued to be noted during surveys. The outcomes of the severely burnt vegetation assessment for the amended project have been considered in the PCT classification and survey methodology for the revised biodiversity assessment. *Technical Report 1 – Revised Biodiversity Development Assessment Report* provides further detail on the outcomes of the severely burnt vegetation assessment.

The amendments and refinements described in Chapter 3 (Description of the amended project) have increased the landscape assessment area (ie within 500 metres of the amended project footprint) used in the revised biodiversity assessment from about 46,555 hectares for the EIS to around 66,588 hectares for the amended project. The main changes from the EIS are the increased extent of the amended project footprint located within the Bondo IBRA subregion (increased by about 6,016 hectares), largely due to the Green Hills corridor amendment, and the increased extent within all subregions due to the nominated access tracks. Figure 6-1 shows the boundaries of the IBRA subregions in relation to the amended landscape assessment area and amended project footprint. Chapter 3 (Description of the amended project) provides comparative figures showing the difference between the amended project footprint and EIS project footprint.

Technical Report 1 – Revised Biodiversity Development Assessment Report includes an updated description of the existing environment for the revised biodiversity assessment for the amended project.



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Amended project footprint
Amended landscape assessment area
Amended locality
Waterway
Substation
IBRA Subregion
Bondo
Bungonia
Crookwell
Inland Slopes
Murrumbateman
Snowy Mountains

Source: *Aurecon, Transgrid, OEH, Spatial Services (DCS), ESRI Basemap*

1:925,000
0 20 40km

Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-1: IBRA subregions in relation to the landscape assessment area

6.2.2. Assessment of amended project

The lodgement of this Amendment Report has been staged, with *Technical Report 1 - Revised Biodiversity Development Assessment Report* to be provided separately .In the event of an inconsistency between this summary of the amended project's potential biodiversity impacts in the following sections and *Technical Report 1 – Revised Biodiversity Development Assessment Report*, the information in *Technical Report 1 – Revised Biodiversity Development Assessment Report* will prevail to the extent of the inconsistency.

6.2.2.1. Construction impacts

Direct impacts

The amended project could directly impact 866.16 hectares of native vegetation based on the amended indicative disturbance area (excluding Category 1 – exempt land). The direct impacts on native vegetation have increased by 196.28 hectares generally across all IBRA subregions compared to the EIS project, with the increase related to clearing associated with:

- changes to the transmission line corridor
- new construction ancillary facilities, including worker accommodation facilities and construction compounds
- nomination of access tracks
- additional telecommunications connections to existing substations.

The exact location and extent of the vegetation clearance required for the final transmission line easement and associated permanent and temporary infrastructure would be confirmed during finalisation of the detailed design. Where practicable, direct impacts to native vegetation would be avoided as the detailed design is finalised in accordance with mitigation measures detailed in Appendix B.1 (Updated biodiversity mitigation measures).

Table 6-2 summarises the impacts on native vegetation for the amended project based on the IBRA subregions.

Table 6-2 Summary of potential impacts on native vegetation

IBRA subregion	EIS impacted PCTs	EIS impact	Amended project impacted PCTs	Amended project impact
Bondo	PCTs 285, 295, 296, 299 and 953	38.84 ha	PCTs 285, 290, 295, 299, 300, 352, 638 and 953	39.49 ha
Bungonia	PCTs 283, 870, 1093, 1097, 1107, 1150 and 1330	34.17 ha	PCTs 283, 870, 1093, 1097, 1107, 1150 and 1330	49.20 ha
Crookwell	PCTs 280, 283, 335, 679, 727, 731, 952, 1093, 1151, 1191, 1256 and 1330	76.83 ha	PCTs 277, 280, 283, 335, 679, 727, 731, 952, 1093, 1151, 1191, 1256 and 1330	115.04 ha
Murrumbateman	PCTs 266, 278, 280, 283, 287, 322, 349, 351, 352, 731, 1093, and 1330	98.11 ha	PCTs 266, 277, 280, 283, 287, 322, 349, 351, 352, 731, 1093, 1256 and 1330	129.07 ha
Inland Slopes	PCTs 5, 266, 268, 277, 278, 280, 287, 290, 294, 297, 299, 301, 306, 314, 316, 319, 343, 352, 731 and 1191	245.29 ha	PCTs 5, 266, 268, 277, 278, 280, 287, 290, 294, 295, 297, 299, 301, 306, 314, 316, 319, 343, 352, 731 and 1191	331.93 ha
Snowy Mountains	PCTs 300, 638, 679, 939, 953, 1196 and 1224	176.97 ha	PCTs 285, 300, 637, 638, 679, 939, 953, 1196 and 1224	201.43 ha
Total		**670.21 ha**		**866.16 ha**

Consistent with Chapter 8 (Biodiversity) of the EIS, the amended project footprint contains five threatened ecological communities (TECs) listed under the *Biodiversity Conservation Act 2016* (BC Act), with two of these TECs also listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Table 6-3 summarises the potential vegetation clearing impacts on the TECs identified within the amended project footprint based on the amended indicative disturbance area. Compared to the EIS, potential impacts have:

- increased for White Box Yellow Box Blakely's Red Gum Woodland and Derived Native Grassland TEC due to new construction ancillary facilities (ie Tarcutta accommodation facility and compound (AC03), Adjungbilly accommodation facility and compound (AC04) and Crookwell accommodation facility and compound (AC06)) and nomination of additional access tracks
- increased for Coolac-Tumut Serpentinite Shrubby Woodland TEC due to the nomination of additional access tracks
- reduced for Tableland Basalt Forest TEC due to the Green Hills corridor amendment
- generally remained consistent for Montane Peatlands and Swamps/Alpine Sphagnum Bogs and Associated Fens TEC and Monaro Tableland Cool Temperate Grassy Woodland TEC.

Avoidance and minimisation of direct impacts on TECs will continue to be prioritised during the finalisation of the detailed design in accordance with mitigation measures detailed in Appendix B.1 (Updated biodiversity mitigation measures).

Table 6-3 Potential impacts on threatened ecological communities

TEC	PCT(s)	Conservation status[1]	EIS project impact	Amended project impact	IBRA subregion
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South-Eastern Highlands, NSW South-Western Slopes, South-East Corner and Riverina Bioregion	266, 268, 277, 278, 280, 283, 352, 1330	BC Act - CE	331.78 ha	457.18 ha	Bungonia Crookwell Murrumbateman Inland Slopes Bondo
		EPBC Act - CE	111.47 ha	117.15 ha	Bungonia Crookwell Murrumbateman Inland Slopes
Coolac-Tumut Serpentinite Shrubby Woodland in the NSW South-Western Slopes and South-Eastern Highlands Bioregions	301	BC Act - E	1.42 ha	3.38 ha	Inland Slopes
Tableland Basalt Forest in the Sydney Basin and South-Eastern Highlands Bioregions	952, 953, 1097, 1107	BC Act - E	37.42 ha	6.62 ha	Bungonia Crookwell Bondo
Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South-East Corner, South-Eastern Highlands and Australian Alps bioregion/Alpine Sphagnum Bogs and Associated Fens	637, 939, 1256	BC Act - E	0.75 ha	0.92 ha	Crookwell Murrumbateman Snowy Mountains
		EPBC Act - E	0.56 ha	0.58 ha	Snowy Mountains

TEC	PCT(s)	Conservation status[1]	EIS project impact	Amended project impact	IBRA subregion
Monaro Tableland Cool Temperate Grassy Woodland in the South-Eastern Highlands Bioregion	679, 1191	BC Act - CE	1.7 ha	1.92 ha	Crookwell

Note:
1. Conservation status listings: CE - critically endangered; E - endangered; V – vulnerable

A total of 57 candidate threatened flora species were considered to have potential habitat within the amended project footprint. Of these, 56 threatened flora species have the potential to be directly impacted by the amended project.

The number of directly impacted threatened flora species has reduced compared to the EIS due to species no longer included in the amended project. Additional species were excluded following consultation with NSW DCCEEW Environment and Heritage, and/or the species being ruled out following further surveys. Two additional species have been identified in the amended project footprint, *Caladenia montana* (listed as vulnerable under the BC Act) and *Pimelea bracteata* (listed as critically endangered under the BC Act and EPBC Act).

Six of the 56 threatened flora species that have the potential to be directly impacted by the amended project have been recorded within the amended project footprint. These include Yass Daisy (*Ammobium craspedioides*), Hoary Sunray (*Leucochrysum albicans var. tricolor*), *Pimelea bracteata*, Bago Leek Orchid (*Prasophyllum bagoense*), Kelton's Leek Orchid (*Prasophyllum keltonii*) and Swamp Everlasting (*Xerochrysum palustre*). The remaining 40 species are assumed present. Avoidance and minimisation of direct impacts on threatened flora species will continue to be prioritised during the finalisation of the detailed design in accordance with mitigation measures detailed in Appendix B.1 (Updated biodiversity mitigation measures).

Of the 56 threatened flora species that have the potential to be directly impacted by the amended project, nine species are listed as critically endangered under the BC Act and/or EPBC Act. This number has been reduced compared to the EIS, as three critically endangered flora species are no longer considered impacted for the amended project, including *Euphrasia arguta*, *Prasophyllum sp*. Wybong, and Clover Glycine (*Glycine latrobeana*). Overall, except for *Bossiaea fragrans and Pimelea bracteata*, potential direct impacts on critically endangered species have been reduced for the amended project compared to the EIS.

Table 6-4 summarises potential direct impacts on critically endangered flora species. *Technical Report 1 – Revised Biodiversity Development Assessment Report* provides further details on the potential direct impacts on listed endangered and vulnerable flora species affected by the amended project.

Table 6-4 Summary of potential direct impacts on critically endangered flora species under the BC Act and/or EPBC Act

Species	Conservation status[1]	IBRA subregion	EIS impact	Amended project impact
Bossiaea fragrans	BC Act – CE EPBC Act - CE	Inland Slopes	6.1 ha	6.23 ha
Wee Jasper Grevillea (*Grevillea iaspicula*)	BC Act – CE EPBC Act - E	Murrumbateman	9 count	8 count
Tumut Grevillea (*Grevillea wilkinsonii*)	BC Act – CE EPBC Act - E	Inland Slopes	34.7 ha	21 ha

Species	Conservation status[1]	IBRA subregion	EIS impact	Amended project impact
Pimelea bracteata	BC Act – CE EPBC Act – CE	Bondo	N/A	4.66 ha
Delicate Pomaderris (*Pomaderris delicata*)	BC Act – CE EPBC Act – CE	Bungonia	8.0 ha	1.37 ha
Bago Leek Orchid (*Prasophyllum bagoense*)	BC Act – CE EPBC Act – CE	Snowy Mountains	31.9 ha	0.04 ha
Brandy Marys Leek Orchid (*Prasophyllum innubum*)	BC Act – CE EPBC Act – CE	Snowy Mountains	0.3 ha	0.02 ha
Kelton's Leek Orchid (*Prasophyllum keltonii*)	BC Act – CE EPBC Act – CE	Snowy Mountains	31.7 ha	0.03 ha
Blue-tongued Greenhood (*Pterostylis oreophila*)	BC Act – CE EPBC Act – CE	Snowy Mountains	0.6 ha	0.56 ha

Note:
1. Conservation status listings: CE - critically endangered; E - endangered

A total of 47 candidate threatened fauna species were considered to have potential habitat within the amended project footprint. Of these, 29 threatened fauna species and two endangered fauna populations have been identified as having the potential to be directly impacted by the amended project. The number of directly impacted threatened fauna species has reduced compared to the EIS due to species habitat no longer being included in the amended project. Additional species were excluded following consultation with NSW DCCEEW Environment and Heritage, and/or the species being ruled out following further surveys.

Fourteen of 29 threatened fauna species that have potential to be directly impacted by the amended project have been recorded during fauna surveys. The remaining 15 species have been assumed present. Avoidance and minimisation of direct impacts on threatened fauna species will continue to be prioritised during the finalisation of the detailed design in accordance with mitigation measures detailed in Appendix B.1 (Updated biodiversity mitigation measures).

Of the 29 threatened fauna species that have the potential to be directly impacted by the amended project, 11 species are listed as critically endangered or endangered under the BC Act and/or EPBC Act. This number has been reduced compared to the EIS, as one critically endangered fauna species and one endangered fauna species are no longer considered impacted for the amended project, including Southern Corroboree Frog (*Pseudophryne corroboree*) and Brush-tailed Rock-wallaby (*Petrogale penicillate*), respectively.

Table 6-5 summarises the potential direct impacts on critically endangered and endangered fauna species and the two endangered populations. *Technical Report 1 – Revised Biodiversity Development Assessment Report* provides further details on the potential direct impacts on listed vulnerable fauna species affected by the amended project.

Table 6-5 Summary of potential direct impacts on critically endangered and endangered fauna species under the BC Act and/or EPBC Act

Species/populations	Conservation status[1]	IBRA subregion	EIS impact	Amended project impact
Bush Stone-curlew (*Burhinus grallarius*)	BC Act - E	Inland Slopes	60.5 ha	30.99 ha
Gang-gang Cockatoo (*Callocephalon fimbriatum*)	BC Act - V EPBC Act - E	Bondo Bungonia Crookwell Inland Slopes Murrumbateman Snowy Mountains	306.4 ha	430.15 ha
Sloane's Froglet (*Crinia sloanei*)	BC Act - E EPBC Act - E	Inland Slopes	2.6 ha	0.66 ha
Alpine She-oak Skink (*Cyclodomorphus praealtus*)	BC Act - E EPBC Act - E	Snowy Mountains	12.2 ha	30.83 ha
Key's Matchstick Grasshopper (*Keyacris scurra*)	BC Act - E EPBC Act - E	Crookwell Inland Slopes Murrumbateman	229 ha	161.89 ha
Booroolong Frog (*Litoria booroolongensis*)	BC Act - E EPBC Act - E	Inland Slopes Crookwell	0.1 ha	0.6 ha
Yellow-spotted Tree Frog (*Litoria castanea*)	BC Act - CE EPBC Act - CE	Snowy Mountains Crookwell	1.4 ha	1.17 ha
Stuttering Frog (*Mixophyes balbus*)	BC Act - E EPBC Act - V	Bungonia	13.8 ha	13.87 ha
Greater Glider (*Petauroides volans*)	BC Act - E EPBC Act - E	Bondo Bungonia Inland Slopes Snowy Mountains	116.3 ha	109.28 ha
Koala (*Phascolarctos cinereus*)	BC Act - E EPBC Act - E	Bondo Bungonia Crookwell Inland Slopes Murrumbateman Snowy Mountains	418.4 ha	441.09 ha
Yellow-bellied Glider (*Petaurus australis*) population on the Bago Plateau	BC Act - EP	Bondo Snowy Mountains	19.4 ha	172.62 ha
Squirrel Glider (*Petaurus norfolcensis*) in the Wagga Wagga City Local Government Area	BC Act - EP	Inland Slopes	46.7 ha	5.43 ha
Smoky Mouse (*Pseudomys fumeus*)	BC Act - CE EPBC Act - E	Bondo	132.7 ha	5.78 ha

Note:
1. Conservation status listings: CE - critically endangered; E - endangered; EP - endangered population; V – vulnerable

Indirect and prescribed biodiversity impacts

The types of potential indirect impacts and prescribed biodiversity impacts associated with constructing the amended project remain consistent with those described in Chapter 8 (Biodiversity) of the EIS.

The types of indirect impacts that could occur during construction include:

- inadvertent impacts on adjacent habitat or vegetation
- reduced viability of adjacent habitat due to light, noise, dust, vibration and blasting
- transport of weeds and pathogens from the site to adjacent vegetation
- increased risk of starvation or exposure, and loss of shade or shelter
- trampling of threatened flora species
- removal and disturbance of rocks, including bush rock
- increase in pest animal populations and predation of native fauna.

The prescribed biodiversity impacts associated with construction include:

- impacts on the other habitat of threatened species or TECs, such as caves and other geological features, human made structures and non-native vegetation
- impacts on water quality, waterways and hydrological processes that are relied on by threatened species or TECs
- impact of vehicle strikes on threatened species or animals that are part of a TEC.

While the types of potential indirect impacts and prescribed biodiversity impacts remain consistent, the amended project has the potential to change the scale and location of the impacts compared to the EIS. This is primarily due to different impact locations or increased habitat impacts. Notwithstanding, the consequences of the potential indirect impacts and prescribed biodiversity impacts and potentially impacted entities are generally consistent with those identified for the EIS.

Avoidance and minimisation of potential indirect impacts and prescribed biodiversity impacts will continue to be prioritised during detailed design and construction of the amended project with the implementation of mitigation measures detailed in Appendix B.1 (Updated biodiversity mitigation measures).

Serious and irreversible impacts

Transgrid has sought to avoid and minimise potential impacts to threatened species and TECs at risk of serious and irreversible impacts (SAII) during the development of the amended project to the extent practicable.

Due to changes in potential direct, indirect and prescribed biodiversity impacts that may occur during construction of the amended project and consideration of further surveys carried out between September 2023 and March 2024, the potential for SAII has been updated for several SAII entities compared to the EIS project. In addition, eight flora species and two fauna species previously considered at risk of SAII in Chapter 8 (Biodiversity) of the EIS have been excluded from the amended project due to changes in the project footprint, further consultation with NSW DCCEEW Environment and Heritage and/or have been ruled out from further surveys carried out between September 2023 and March 2024.

Three SAII entities considered likely at risk of SAII are predicted within the amended project footprint, including White Box-Yellow Box-Blakely's Red Gum Grassy Box Woodland and Derived Native Grassland TEC (recorded), *Pimelea bracteata* (recorded), Sooty Owl (*Tyto tenebricosa*) (assumed present). In addition, seven SAII entities considered to have potential risk of SAII have also been recorded or assumed

present within the amended project footprint, including, Bago Leek Orchid (*Prasophyllum bagoense*), Brandy Mary's Leek Orchid (*Prasohyllum innubum*), Kelton's Leek Orchid (*Prasophyllum keltonii*), Blue-tongued Greenhood (*Pterostylis oreophila*), *Solanum armourense*, Yellow-spotted Tree Frog (*Litoria castanea*) and Smoky Mouse (*Pseudomys fumeus*). A further 14 TECs and threatened species recorded or assumed present have a low likelihood of SAII.

Table 6-6 summarises the SAII entities considered at risk of being impacted by the amended project. Overall, the risk of SAII to threatened species and TECs from the amended project has been reduced compared to the findings in the EIS. *Technical Report 1 – Revised Biodiversity Development Assessment Report* provides further detail on the extent and severity of the amended project's impacts on each SAII entity.

Table 6-6 SAII entities considered at risk to be impacted by the amended project

SAII entity	Conservation status[1]	EIS SAII assessment risk[2]	Amended project SAII assessment risk[2]
TECs			
White Box-Yellow Box-Blakely's Red Gum Grassy Box Woodland and Derived Native Grassland	BC Act – CE	Likely	Likely
Tableland Basalt Forest	BC Act – E	Likely	Potential
Coolac-Tumut Serpentinite Shrubby Woodland	BC Act – E	Potential	Potential
Monaro Tableland Cool Temperate Grassy Woodland	BC Act – CE	Potential	Potential
Threatened flora			
Bossiaea fragrans	BC Act – CE EPBC Act – CE	Unlikely	Unlikely
Crimson Spider Orchid (*Caladenia concolor*)	BC Act – E EPBC Act – V	Unlikely	Unlikely
Mauve Burr-daisy (Calotis glandulosa)	BC Act – V EPBC Act – V	Unlikely	Unlikely
Robertson's Peppermint (*Eucalyptus robertsonii subsp. hemisphaerica*)	BC Act – V EPBC Act – V	Unlikely	Unlikely
Superb Midge Orchid (*Genoplesium superbum*)	BC Act – E	Unlikely	Unlikely
Wee Jasper Grevillea (*Grevillea iaspicula*)	BC Act – CE EPBC Act – E	Unlikely	Unlikely
Tumut Grevillea (*Grevillea wilkinsonii*)	BC Act – CE EPBC Act – CE	Unlikely	Unlikely
Pimelea bracteata	BC Act – CE EPBC Act – CE	N/A	Likely
Delicate Pomaderris (*Pomaderris delicata*)	BC Act – CE EPBC Act – CE	Unlikely	Unlikely
Pale Pomaderris (*Pomaderris pallida*)	BC Act – V EPBC Act – V	Unlikely	Unlikely
Bago Leek Orchid (*Prasophyllum bagoense*)	BC Act – CE EPBC Act – CE	Likely	Potential

SAII entity	Conservation status[1]	EIS SAII assessment risk[2]	Amended project SAII assessment risk[2]
Brandy Marys Leek Orchid (*Prasophyllum innubum*)	BC Act – CE EPBC Act – CE	Potential	Potential
Kelton's Leek Orchid (*Prasophyllum keltonii*)	BC Act – CE EPBC Act – CE	Likely	Potential
Blue-tongued Greenhood (*Pterostylis oreophila*)	BC Act – CE EPBC Act – CE	Potential	Potential
Solanum armourense	BC Act – E	Potential	Potential
Threatened fauna			
Large-eared Pied Bat (*Chalinolobus dwyeri*)	BC Act – V EPBC Act – V	Unlikely	Unlikely
Yellow-spotted Tree Frog (*Litoria castanea*)	BC Act – CE EPBC Act – E	Potential	Potential
Large Bent-winged Bat (*Miniopterus orianae oceanensis*)	BC Act – V	Unlikely	N/A[3]
Stuttering Frog (*Mixophyes balbus*)	BC Act – E EPBC Act – V	Unlikely	Unlikely
Smoky Mouse (*Pseudomys fumeus*)	BC Act – CE EPBC Act – E	Likely	Potential
Sooty Owl (*Tyto tenebricosa*)	BC Act – V	Potential	Likely

Note:

1. Conservation status listings: CE - critically endangered; E - endangered; V – vulnerable
2. SAII assessment risk: Likely – SAII likely based on the extent of impacts and known presence/likelihood of occurrence; Potential – low risk of SAII due to the extent of impacts, limited likelihood of presence and/or proposed mitigation; Unlikely – risk of SAII based on a conservative assessment only and is considered unlikely.
3. Large Bent-winged Bat was conservatively assessed at risk of SAII as part of the EIS. However, additional survey as part of *Technical Report 1 – Revised Biodiversity Development Assessment Report* has excluded the potential for breeding habitats to occur within the amended project footprint. As such, Large Bent-winged Bat is no longer considered at risk of SAII for the amended project.

Avoidance and minimisation of impacts on SAII entities will continue to be prioritised during the finalisation of the detailed design. Mitigation measures detailed in Appendix B.1 (Updated biodiversity mitigation measures) will also be implemented to minimise and manage impacts during construction, such as the BMP, which will include adaptive management measures for uncertain/indirect/prescribed biodiversity impacts and a biodiversity monitoring program.

Impacts on aquatic species and habitats

The types of potential direct and indirect impacts on aquatic species and habitats due to the amended project remain generally consistent with those described in Chapter 8 (Biodiversity) of the EIS.

The amended project footprint includes 1,548 waterways, an increase of 409 compared to the EIS project footprint. However, similar to Chapter 8 (Biodiversity) of the EIS, most of these waterways are first and second order streams, reflecting the dominance of smaller waterways within the amended project footprint.

Changes to the transmission line corridor and the nomination of access tracks as part of the amended project have increased the amount of Key Fish Habitat (KFH) and potential habitat for threatened aquatic species within the amended project footprint that may be impacted. One hundred and ninety-two (192) indicative waterway crossings that are potentially required for the amended project intersect with mapped

KFH or potential habitats for threatened aquatic species. This is an increase of 162 from the EIS project footprint. However, the waterways subject to indicative access track crossings are typically degraded and in relatively poor condition.

Of the 192 indicative waterway crossings for the amended project, 115 have been identified within Class 1 (Major Key Fish Habitat) KFH waterways. However, of the 115, only 35 are associated with new or upgraded tracks (as described in Chapter 3 (Description of the amended project). The remaining 80 waterway crossings are associated with existing tracks/roads, which are anticipated to be subject to maintenance activities or minor upgrades as part of amended project. Where drainage work is needed within mapped KFH or potential habitats for threatened aquatic species, impacts would be avoided and/or minimised by implementing mitigation measures detailed in Appendix B.1 (Updated biodiversity mitigation measures).

One additional threatened aquatic species has been identified as potentially occurring within the amended project footprint. Riek's Crayfish (*Euastacus reiki*), listed as endangered under the EPBC Act, was listed on 7 September 2023 during the public exhibition period of the EIS. Broadscale predicted habitat mapping for Riek's Crayfish includes a large portion of the amended project footprint through the Bago State Forest. However, construction of the amended project is unlikely to result in a significant impact on Riek's Crayfish. This is due to the anticipated localised and temporary nature of potential impacts from any drainage work within the predicted habitat mapping and implementation of mitigation measures detailed in Appendix B.1 (Updated biodiversity mitigation measures) regarding the design and management of waterway crossings.

Consistent with Chapter 8 (Biodiversity) of the EIS, construction of the amended project is also unlikely to significantly impact the other identified threatened aquatic species and threatened aquatic ecological community.

Impacts on groundwater dependent ecosystems

Potential impacts on terrestrial groundwater dependent ecosystems (GDEs) may be increased for the amended project. The amended project footprint includes 32 potential terrestrial GDEs compared to 15 potential terrestrial GDEs from the EIS. These GDEs generally correspond with the location of large waterways in the amended project footprint. The increase in potential terrestrial GDEs is mainly due to the nomination of access tracks throughout the amended project footprint.

Thirteen potential terrestrial GDEs are located within 50 metres of potential controlled blasting areas proposed for the amended project (refer to Chapter 3 (Description of the amended project)). However, controlled blasting would be limited to specific locations. With the implementation of the proposed mitigation measures included in Appendix B (Updated mitigation measures) regarding controlled blasting and erosion and sediment control, it is expected that impacts on potential terrestrial GDEs would be minimised.

Other potential risks to groundwater and GDEs as a result of the amendments and refinements are discussed in Section 6.11.2.1. Overall, and consistent with the outcomes in Chapter 8 (Biodiversity) of the EIS, construction of the amended project is unlikely to pose a significant risk to GDEs.

Key threatening processes

The likelihood of relevant key threatening processes listed under the EPBC Act, BC Act and *Fisheries Management Act 1994* (FM Act) and the proposed mitigation approach to reduce impacts during the construction of the amended project remains consistent with that described in Chapter 8 (Biodiversity) of the EIS. Key threatening processes include those related to:

- clearing and degradation of native vegetation and loss of habitat features
- infection and spread of diseases and weeds, and impact from pest species
- increased risk of high frequency fires
- impacts to natural flow regimes of rivers and streams.

6.2.2.2. Operational impacts

Direct impacts

Potential direct impacts on native vegetation and habitats of threatened species during the operation of the amended project would occur through ongoing vegetation management to ensure vegetation clearance requirements and Asset Protection Zones (APZs) are maintained. However, similar to the approach undertaken for the EIS, potential direct impacts on native vegetation, TECs and threatened species habitat during operation will be reduced wherever practicable including retention of shrubs and groundcovers on easement. Clearing estimates are outlined in Section 6.2.2.1.

Indirect and prescribed biodiversity impacts

Similar to that described in Chapter 8 (Biodiversity) of the EIS, some indirect impacts associated with constructing the amended project may also occur during operation. However, the extent of these impacts would be less than during construction given the reduced scale of work during operation. Additional indirect impacts that may arise during the operation of the amended project remain consistent with the EIS and include:

- reduced viability of adjacent habitat due to edge effects
- changed fire regimes
- electric and magnetic field (EMF) exposure
- fauna collision and electrocution with transmission lines.

The proposed mitigation approach to reduce indirect impacts during the operation of the amended project remains consistent with that described in Chapter 8 (Biodiversity) of the EIS.

Potential prescribed biodiversity impacts during the operation of the amended project would also be similar to those described in Chapter 8 (Biodiversity) of the EIS and would relate to impacts on habitat connectivity and injury or mortality from transmission line collision, entanglement, or electrocution.

The amended project would not increase connectivity impacts, with impacts remaining comparable to those assessed in Chapter 8 (Biodiversity) of the EIS, including consequences and the likely entities that could be impacted. Similar to the approach for the EIS, the development and implementation of the Connectivity Strategy is the primary mitigation measure proposed to mitigate impacts of isolation and facilitate fauna movement throughout the amended project footprint and broader landscape. In addition, potential connectivity and fragmentation impacts associated with TECs would be avoided and/or minimised as the detailed design is finalised where practicable and in accordance with mitigation measures detailed in Appendix B.1 (Updated biodiversity mitigation measures).

Prescribed impacts associated with the injury or mortality from transmission line collision, entanglement, or electrocution and the proposed mitigation approach to manage impacts during the operation of the amended project remain consistent with that described in Chapter 8 (Biodiversity) of the EIS.

Serious and irreversible impacts

Consistent with Chapter 8 (Biodiversity) of the EIS, the majority of SAII impacts associated with the amended project are related to the removal of habitat during construction. However, some impacts on SAII entities could potentially occur during operation due to increased fragmentation and/or loss of habitat connectivity.

SAII entities that could be impacted by increased fragmentation and/or loss of habitat connectivity include the TECs and threatened fauna listed in Table 6-6. However, the amended project would not increase connectivity and fragmentation impacts, with impacts remaining comparable to those assessed in Chapter 8 (Biodiversity) of the EIS. Mitigation measures detailed in Appendix B.1 (Updated biodiversity mitigation measures), including the Connectivity Strategy, which outlines connectivity for gliders to be re-established over existing easements, will be implemented to avoid and/or mitigate potential connectivity and fragmentation impacts.

Impacts on aquatic species and habitats and groundwater dependent ecosystems

The amended project would have limited operational impacts on aquatic species and habitats, and GDEs. The main operational impacts would be associated with impacts to surface water and groundwater quality during maintenance activities and changes to waterway geomorphology (refer to Section 6.11.2.2). While the amended project may change the location of potential impacts, overall, the potential operational impacts of the amended project would remain consistent with the impacts described in Chapter 8 (Biodiversity) of the EIS.

Key threatening processes

The likelihood of relevant key threatening processes listed under the EPBC Act, BC Act and FM Act and the proposed mitigation approach to reduce impacts during the operation of the amended project remains consistent with that described in Chapter 8 (Biodiversity) of the EIS.

6.2.2.3. Matters of national environmental significance

Potential impacts for EPBC Act listed species and TECs as a result of the amended project have been summarised in Section 6.2.2.1 and Section 6.2.2.2 as relevant.

An updated EPBC Act Protected Matters Search Tool of the locality (ie a 10-kilometre buffer around the amended project footprint) as part of the revised biodiversity assessment identified 127 EPBC Act listed species and TECs as potentially occurring within this buffer.

Due to changes in potential direct and indirect impacts associated with the construction and operation of the amended project compared to the EIS project and consideration of further surveys carried out between September 2023 and March 2024, the likelihood of significant impacts on some EPBC Act listed species and TECs has been updated. Additionally, seven EPBC Act listed species that were not previously considered for the EIS have been considered for the amended project.

Overall, of the 127 EPBC Act listed entities identified, there is a likelihood that 40 could be significantly impacted as a result of the amended project. The level of likelihood is based on presence within the amended project footprint, the extent and severity of potential impacts, and the ability to avoid and/or

minimise potential impacts during the finalisation of the detailed design. A precautionary approach has also been applied where there is incomplete survey coverage and/or there is insufficient certainty that impacts can be avoided during finalisation of detailed design. Of the 40 EPBC Act listed entities with a likelihood of being significantly impacted, one TEC, six threatened flora species, 10 threatened fauna species and three migratory species have been recorded within the amended project footprint. The remaining EPBC Act listed entities with a likelihood of being significantly impacted are assumed present. An additional 19 EPBC Act listed entities assessed as part of the revised biodiversity assessment were considered unlikely to be significantly impacted as a result of the amended project.

Table 6-7 summarises the EPBC Act listed entities with a likelihood of being significantly impacted due to the amended project. *Technical Report 1 – Revised Biodiversity Development Assessment Report* provides further detail on the extent and severity of the amended project's impacts for all EPBC Act listed entities including those considered unlikely to be significantly impacted.

Table 6-7 EPBC Act listed entities with a likelihood of being significantly impacted by the amended project

EPBC Act listed entity	EPBC Act conservation status[1]	EIS significant impact likelihood[2]	Amended project significant impact likelihood[2]
TECs			
White Box-Yellow Box-Blakely's Red Gum Grassy Box Woodland and Derived Native Grassland	CE	Likely	Likely
Alpine Sphagnum Bogs and Associated Fens	E	Potential (precautionary)	Unlikely
Threatened flora			
Bynoe's Wattle (*Acacia bynoeana*)	V	Potential (precautionary)	Potential (precautionary)
Yass Daisy (*Ammobium craspedioides*)	V	Potential	Likely
Buttercup Doubletail (*Diuris aequalis*)	E	NA	Potential (precautionary)
Cambage Kunzea (*Kunzea cambagei*)	V	Potential (precautionary)	Potential (precautionary)
Hoary Sunray (*Leucochrysum albicans var. tricolor*)	E	Potential	Likely
Pimelea bracteata	CE	N/A	Likely
Cotoneaster Pomaderris (*Pomaderris cotoneaster*)	E	Potential (precautionary)	Potential (precautionary)
Bago Leek Orchid (*Prasophyllum bagoense*)	CE	Potential	Potential
Brandy Marys Leek Orchid (*Prasophyllum innubum*)	CE	Unlikely	Potential
Kelton's Leek Orchid (*Prasophyllum keltonii*)	CE	Potential	Potential
Blue-tongued Greenhood (*Pterostylis oreophila*)	CE	Potential (precautionary)	Potential (precautionary)
Austral Toadflax (*Thesium australe*)	V	Potential (precautionary)	Potential (precautionary)
Swamp Everlasting (*Xerochrysum palustre*)	V	Potential (precautionary)	Likely

EPBC Act listed entity	EPBC Act conservation status[1]	EIS significant impact likelihood[2]	Amended project significant impact likelihood[2]
Threatened fauna			
Regent Honeyeater (*Anthochaera phrygia*)	CE	Potential (precautionary)	Potential (precautionary)
Southern Whiteface (*Aphelocephala leucopsis*)	V	N/A	Potential (precautionary)
Pink-tailed Legless Lizard (*Aprasia parapulchella*)	V	Likely	Likely
Sharp-tailed Sandpiper (*Calidris acuminata*)	V, M	Potential	Potential (precautionary)
Gang-gang Cockatoo (*Callocephalon fimbriatum*)	E	Potential	Potential
Glossy Black-Cockatoo (*Calyptorhynchus lathami*)	V	Potential	Potential
Brown Treecreeper (*Climacteris picumnus victoriae*)	V	N/A	Potential
Spotted-tailed Quoll (*Dasyurus maculatus*)	E	Potential	Potential
Striped Legless Lizard (*Delma impar*)	V	Potential	Potential
Latham's Snipe (*Gallinago hardwickii*)	V, M	Potential	Potential (precautionary)
Painted Honeyeater (*Grantiella picta*)	V	Potential	Potential
Key's Matchstick Grasshopper (*Keyacris scurra*)	E	Potential	Potential
Swift Parrot (*Lathamus discolor*)	E	Potential	Potential
South-Eastern Hooded Robin (*Melanodryas cucullata cucullate*)	E	N/A	Potential
Greater Glider (*Petauroides volans*)	V	Potential	Potential
Yellow-bellied Glider (*Petaurus australis*)	V	Potential	Potential
Koala (*Phascolarctos cinereus*)	E	Likely	Likely
Superb Parrot (*Polytelis swainsonii*)	V	Potential	Potential
Grey-headed Flying-fox (*Pteropus poliocephalus*)	V	Potential	Potential
Pilotbird (*Pycnoptilus floccosus*)	V	Potential (precautionary)	Potential (precautionary)
Diamond Firetail (*Stagonopleura guttata*)	V	N/A	Potential
Golden Sun Moth (*Synemon plana*)	V	Potential	Potential

EPBC Act listed entity	EPBC Act conservation status[1]	EIS significant impact likelihood[2]	Amended project significant impact likelihood[2]
Migratory			
Fork-tailed Swift (*Apus pacificus*)	M	Potential (precautionary)	Potential (precautionary)
Red-necked Stint (*Calidris ruficollis*)	M	Potential	Potential (precautionary)
Common Greenshank (*Tringa nebularia*)	M	Potential	Potential (precautionary)
Marsh Sandpiper (*Tringa stagnatilis*)	M	Potential	Potential (precautionary)

Note:

1. EPBC Act conservation status listings: CE - critically endangered; E - endangered; V – vulnerable; M – migratory
2. Significant impact likelihood: Likely – impact based on the known presence or a moderate and above potential to occur within the amended project footprint and limited ability to reduce extent and/or severity of potential impacts during finalisation of detailed design; Potential – impact based on the known presence or a moderate and above potential to occur within the amended project footprint and high possibility to reduce extent and/or severity of potential impacts during finalisation of detailed design; Potential (precautionary) – impact based on incomplete survey coverage/assumed presence and/or there is insufficient certainty that impacts can be avoided during finalisation of detailed design.

Avoiding and minimising impacts on EPBC Act listed species and TECs will continue to be prioritised during the finalisation of the detailed design. Mitigation measures detailed in Appendix B.1 (Updated biodiversity mitigation measures) will also be implemented to minimise and manage impacts, such as the BMP and Connectivity Strategy. Any residual impacts would be appropriately offset (refer to Section 6.2.4).

6.2.3. Updated mitigation measures

The approach to management and avoidance/minimisation of impacts on biodiversity remains largely consistent with the approach provided in Chapter 8 (Biodiversity) of the EIS. However, a number of biodiversity mitigation measures presented in the EIS have been updated as a result of the proposed amendments and refinements to avoid and minimise biodiversity impacts and consideration of detailed feedback provided by NSW DCCEEW Environment and Heritage.

The main updates include, but are not limited to:

- further detail on approaches to avoid impacts during finalisation of the detail design and construction methodology, such as the use of biodiversity constraints mapping and additional survey to guide the prioritisation of areas of high biodiversity conservation significance to avoid where practicable
- incorporation of an adaptive management measures in the BMP
- requirements for supplementary biodiversity surveys following planning approval in areas not previously subject to survey
- additional species-specific mitigation measures to further minimise and manage impacts on threatened flora and fauna and TECs
- further detail required to be considered as part of the development of the Connectivity Strategy
- further detail on avoiding and/or minimising impacts to aquatic species and habitats during the design, construction and management of proposed waterway crossings
- additional requirements for continued consultation with NSW DCCEEW Environment and Heritage and DPI Fisheries regarding the management of impacts.

The consolidated list of biodiversity mitigation measures for the amended project is provided in Appendix B.1 (Updated biodiversity mitigation measures).

6.2.4. Updated offset requirements

In accordance with the *Biodiversity Assessment Method* (Department of Planning, Industry and Environment (DPIE), 2020b) (BAM), offset requirements are necessary to address any residual biodiversity impacts associated with the amended project. The offset requirements are based on the updated indicative disturbance area and include 75 species, with some species being both recorded and assumed present due to survey limitations and land access. Additional surveys will be conducted following project approval to further exclude species based on field surveys.

As the amended project would not result in a net loss of KFH, or significant impacts on threatened aquatic species, offsets for aquatic species and key fish habitats are not proposed under the FM Act.

The Biodiversity Offset Strategy for the amended project remains consistent with that described in Chapter 8 (Biodiversity) of the EIS and is documented in *Technical Report 1 – Revised Biodiversity Development Assessment Report*. The strategy proposes a combination of the following offset delivery options, in order of preference:

- establishing Biodiversity Stewardship Agreement sites on lands with like-for-like biodiversity values to those impacted by the amended project
- purchasing and retiring existing biodiversity credits currently available on the biodiversity credit register or via the Biodiversity Credits Supply Fund and Taskforce
- making a payment into the Biodiversity Conservation Fund for residual credits not sourced from the other options above.

Technical Report 1 – Revised Biodiversity Development Assessment Report provides further detail on the offset requirements for the project.

6.3. Aboriginal heritage

6.3.1. Approach to assessment

Technical Report 2 - Revised Aboriginal Cultural Heritage Assessment Report provides the Aboriginal heritage assessment approach and methodology for the project, assesses the impacts associated with the amended project and responds to issues raised during public exhibition of the EIS, where required.

The legislative and policy context and methodology for the assessment is presented in *Technical Report 2 - Revised Aboriginal Cultural Heritage Assessment Report*. As a result of changes to the amended project footprint and updates to methodology in response to government agency feedback, the methodology for the revised assessment included:

- an update of the sensitivity models
- an updated Aboriginal Heritage Information Management System (AHIMS) search (18 October 2023) for the amended project footprint including a wider search area in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (Department of Environment, Climate Change and Water (DECCW), 2010a)
- field survey and test excavation undertaken between September and October 2023 of accessible properties
- a review of results from the additional field survey and test excavation
- additional consultation with Registered Aboriginal Parties (RAPs) and Heritage NSW.

Searches of the National Native Title Tribunal register were conducted in April 2021 and April 2024 and found no registered native title claimants, native title holders, or current Indigenous land use agreements (ILUA) identified within the amended project footprint. Noting that while the wider Gundungurra ILUA area does overlap with the amended project footprint, the actual lands subject to the ILUA (which includes national parks, state conservation areas and Forestry Corporation of NSW (FCNSW) lands) do not overlap with the amended project footprint.

The study area for the revised Aboriginal cultural heritage assessment is the amended project footprint and is shown in Figure 6-2.

6.3.1.1. Update of sensitivity models

A preliminary Aboriginal archaeological sensitivity model was developed for the EIS to categorise the project footprint into low, moderate and high sensitivity areas for surface and subsurface artefact scatters. The preliminary Aboriginal archaeological sensitivity model was updated for the amended project using a combination of several criteria including updated field survey and test excavation results, slope, previously recorded AHIMS site data, and large bodies of permanent water and waterways, and in response to the Heritage NSW submission on the EIS.

The field surveys and test excavations for the amended project, completed between September 2023 and October 2023, aimed to verify the accuracy of the preliminary Aboriginal archaeological sensitivity model and the identification of potential archaeological deposits (PADs). The test excavation results indicated that two separate models were needed, one to predict subsurface archaeological sensitivity and the other to predict surface archaeological sensitivity.

Both sensitivity models aimed to identify locations of low, moderate and high sensitivity within the amended project footprint. High sensitivity areas are flat to low gradient, easily accessible and in proximity to perennial bodies of water. Moderate sensitivity areas are generally low to moderate gradient, difficult to

access and are further away from waterways. Low sensitivity areas are categorised as high gradient, difficult to access landforms that are distant from water sources. However, the subsurface model reflects the fact that archaeological deposits typically accumulate in areas where people repeatedly occupy. These areas are more dependent on perennial water sources and level to gentler slopes.

6.3.1.2. Aboriginal cultural heritage consultation process

Consultation with Aboriginal people has been carried out in accordance with *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010b) as part of the Aboriginal heritage assessment process for the amended project.

A draft copy of the *Technical Report 2 - Revised Aboriginal Cultural Heritage Assessment Report* was provided to RAPs for comment on 7 February 2024. No responses to the draft *Technical Report 2 - Revised Aboriginal Cultural Heritage Assessment Report* were received following the close of the review period.

Transgrid has also undertaken engagement with RAPs and Local Aboriginal Land Councils following the EIS public exhibition from 11 October 2023 to the end of March 2024. The main topics raised included cultural sensitivity, environmental impacts, project effectiveness and community opportunities and challenges. Refer to *Technical Report 2 - Revised Aboriginal Cultural Heritage Assessment Report* for further information on the RAP consultation.

6.3.2. Assessment of amended project

6.3.2.1. Construction impacts

Potential impacts on Aboriginal heritage items from construction of the amended project include:

- direct disturbance to surface and/or subsurface features of an item that would generally result in a total loss of heritage value
- partial direct disturbance, where there would be direct impacts on only some of the surface and/or subsurface features of an item, generally resulting in partial loss of value
- potential direct disturbance (total or partial), where construction takes place adjacent to an item
- indirect impacts, including impacts on the views to and from heritage items.

Construction activities that have the potential to cause direct impact to Aboriginal heritage items in the amended project footprint include:

- establishment work such as clearing of vegetation
- construction of transmission line structures, including potential controlled blasting
- construction of the proposed Gugaa 500 kV substation
- modification of the Bannaby 500 kV substation and Wagga 330 kV substation
- construction of telecommunications connections
- construction of the new and upgraded access tracks and roads
- establishment of the worker accommodation facilities and construction compounds.

There are 178 Aboriginal sites and PADs located within the amended project footprint that may be directly or indirectly impacted by the project, these are shown in Figure 6-2. Figure 6-2 also indicates newly identified sites that have been found during field surveys for HumeLink and previously recorded sites from AHIMS searches. The 178 sites include:

- 39 previously recorded sites of AHIMS including three PADs (including a modified tree/PAD which was originally recorded as a PAD when an additional modified tree was identified in association with the site)
- 113 artefact locations
- 10 new PADs
- five modified trees
- 11 test excavation locations where Aboriginal objects were found.

However, this assessment is considered a worst-case scenario as it is based on direct impacts occurring throughout the entire amended project footprint. It is likely that the final directly impacted area would be much smaller than the amended project footprint assessed. This is because the amended project footprint presents a conservative transmission line corridor that is generally 200 metres wide, which is larger than the final transmission line easement, which would typically be 70 metres in width (except for a few locations that may require wider easements for specific engineering, safety or land use reasons). The amended project footprint also includes a wider buffer along access tracks for all new and upgraded access tracks, which would typically be 10 metres wide (except in a few locations that may require wider sections). Therefore, not all the land within the amended project footprint would be directly disturbed during construction. The number of sites to be impacted would be confirmed during finalisation of the design and construction methodology, which would continue to identify opportunities to avoid or minimise impacts.

For surface archaeological sensitivity, the amended project footprint includes approximately 2,554 hectares identified as high sensitivity and 2,450 hectares identified as moderate surface sensitivity. This is an increase from the 1,108 hectares identified as high sensitivity and 2,529 hectares identified as moderate sensitive presented in the EIS. For subsurface archaeological sensitivity, the amended project footprint includes approximately 1,272 hectares identified as high sensitivity and 1,786 hectares identified as moderate sensitivity. However, not all the land within the amended project footprint would be used for construction and operation of the project. Therefore, the amount of land impacted by the project within areas of high or moderate archaeological sensitivity for surface and subsurface artefacts is likely to be substantially less and would be confirmed during further detailed design and construction planning.

Artefact scatters, isolated finds, isolated find and charcoal stain, modified tree/PAD and modified trees recorded during the archaeological survey and previously recorded AHIMS sites are presented in Table 6-8.

Table 6-8 Sites of scientific significance – artefact scatters, isolated finds, isolated find and charcoal stain, modified tree/PAD and modified trees

Scientific significance	Amendment report (number of sites)	EIS (number of sites)
Low	118	69
Moderate	35	15
High	4	0

PADs recorded during the archaeological survey and previously recorded PADs from AHIMS are presented in Table 6-9.

Table 6-9 Sites of scientific significance - PADs

Scientific significance	Amendment report (number of sites)	EIS (number of sites)
Low	3	0
Moderate	2	0
Moderate to high	6	4
High	1	0

In addition to the sites presented in Table 6-8 and Table 6-9, eight previously recorded sites are indicated as destroyed on AHIMS and have no significance.

A summary of the comparison of Aboriginal sites that may be directly or indirectly impacted by the amended project between the EIS and amended project is outlined in Table 6-10. There is a noticeable increase in Aboriginal sites since the EIS, this increase is due to the inclusion of additional access tracks, changes in the transmission line corridor alignment and additional sites that were found during the further field surveys. Whilst the number of sites have increased, the impact on areas of cultural significance have been avoided as a result of further consultation and design refinement. Mitigation measures have also been amended to increase avoidance during construction.

Table 6-10 Comparison of Aboriginal cultural heritage findings between the EIS and amended project

	EIS project footprint	Amended project footprint
Previously recorded PADs identified in AHIMS	2	3 including one modified tree/PAD
PADs identified by Navin Officer Heritage Consultants during surveys for the project	6	10
Previously recorded sites identified in AHIMS (excluding PADs)	19	36
Artefact scatters and modified trees (excluding PADs) identified during surveys and test excavations	63	129
Total number of Aboriginal cultural heritage sites	**90**	**178**

Areas and species of cultural significance

Culturally significant sites

At the completion of the EIS public exhibition period, a number of submitters raised concerns over potential impacts on Aboriginal cultural heritage sites including Mudjarn Nature Reserve and the Derringullen Women's site. As a result, the revised Aboriginal Cultural Heritage Assessment Report (ACHAR) includes further information on these areas of cultural significance.

Mudjarn Nature Reserve is an Aboriginal place associated with significant ceremonial sites, burials and a source of natural materials to manufacture traditional weapons and tools. The EIS project footprint and the amended project do not traverse Mudjarn Nature Reserve. The reserve is located about 300 metres from the amended project footprint (transmission line corridor) and would not be directly impacted by the amended project (refer to Figure 6-2 for the location). Furthermore, the indirect visual impact to the significance of this site is assessed to be negligible due to the distance from the amended project.

Consultation with a RAP identified the Derringullen Creek Women's Site, a culturally important traditional women's site, to be located within the EIS project footprint. The RAP raised concerns that a transmission

line traversing the site would be disruptive to the connection of the site to the sky. Concern was also raised about helicopters flying overhead during line inspections.

As a result, the transmission line corridor was narrowed through this area to avoid the transmission line traversing the Derringullen Creek Women's Site. The amended project footprint includes an existing access track that traverses the Derringullen Creek Women's Site. This track may be used to provide access to a limited number of transmission line structures (two to three) along the transmission line corridor. Minor upgrades of the access track may be required to allow for heavy vehicle access.

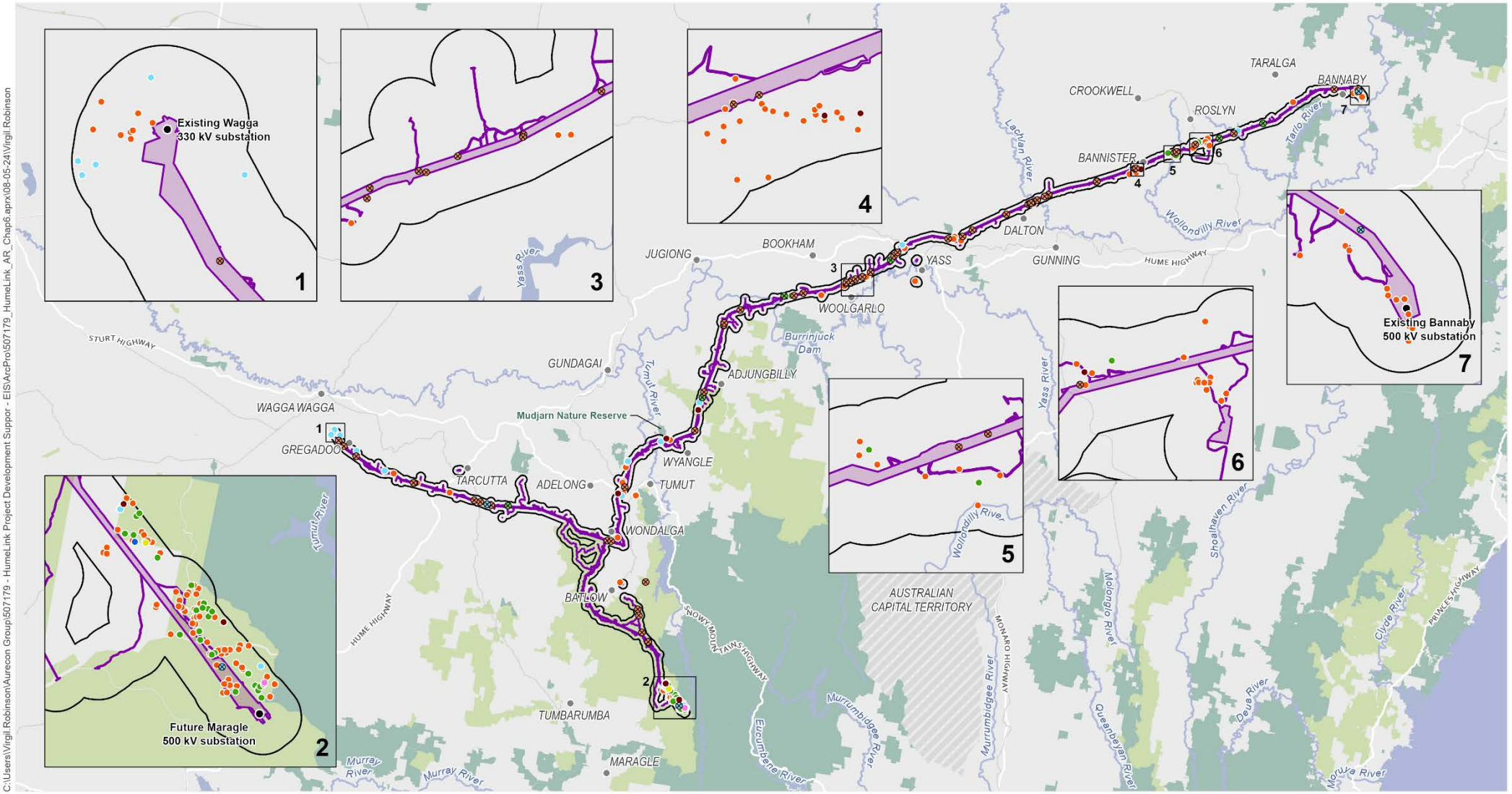
Whilst the amended project footprint provides the potential for the construction of a new two-kilometre access track from the transmission line corridor at this location connecting to Black Range Road to the north. Consideration will be given to avoiding the Derringullen Creek Women's site during further detailed design and construction planning in accordance with mitigation measure AH4 (refer to Appendix B (Updated mitigation measures).

Where impacts to the site cannot be avoided, further consultation with the relevant RAP will be undertaken to seek guidance around minimising and managing the extent of impacts in accordance with new mitigation measure AH15. In addition, mitigation measures AH10 and AH11 (which include briefing workers on heritage sites adjacent to work areas and cultural awareness training) would be implemented to ensure workers in the area are aware of this culturally sensitive site and the relevant protocols that need to be followed to minimise inadvertent impacts to the site.

Bogong moths

The Bogong Moth (*Agrotis infusa*) is of cultural significance and a central part of the Dreamtime for many Indigenous peoples of south-eastern Australia. The annual Bogong moth migration in spring sees the moths migrate towards the Australian Alps where they aestivate (enter a dormant state) at high altitudes in large numbers. Given the species' high cultural and ecological importance, potential impacts to the species are being considered in line with requirements for EPBC Act listed threatened species and communities.

Within the amended project footprint, the Bogong Moth has a moderate likelihood of occurrence during spring migration to summer aestivation sites in the Bogong Ranges. The amended project would result in the loss of approximately 619.66 hectares of potential foraging habitat for the species, this is an approximately 45 per cent reduction in habitat loss from the EIS. Potential residual impacts to Bogong Moth are not considered to be significant. Refer to *Technical Report 1 – Revised Biodiversity Development Assessment Report* for further information on this species. There is also likely to be an increase in artificial lighting during construction of the project, however, the consequences of this would be relatively minor given work would mostly be carried out during daylight hours and mitigation measures to reduce light spill.



Amended project footprint
AHIMS search area
National park and reserve
State forest
Waterbody
Waterway
Major road
Railway

Previously identified site
Aboriginal ceremonial and dreaming
Aboriginal resource and gathering
Artefact
Modified tree (carved or scarred)
PAD
Stone arrangement
Other (multiple categories)

Newly identified site
Artefact / artefact scatter
Modified tree
PAD

Source: *Aurecon, Transgrid, NOHC, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-2: Previously recorded and new Aboriginal heritage sites and PADs

6.3.2.2. Operational impacts

Activities during operation of the amended project that may impact Aboriginal heritage items include:

- vegetation clearing/trimming within the easement
- access track maintenance
- transmission line structure and line maintenance including heavy machinery placement
- stormwater drainage systems maintenance.

Operational impacts have not changed since the EIS. Potential indirect impacts would be low to negligible with the implementation of mitigation measures provided in Appendix B.

6.3.3. Updated mitigation measures

The approach to management and avoidance/ minimisation of impacts to Aboriginal heritage remains largely consistent with the approach provided in Chapter 9 (Aboriginal heritage) of the EIS. A number of Aboriginal heritage mitigation measures presented in the EIS have been updated as a result of the proposed amendments and refinements to avoid and minimise Aboriginal heritage impacts.

There have also been changes to the numbering of mitigation measures in the revised ACHAR. The updates are shown in **green** and ~~**strikethrough**~~ in Table 6-11. The following updates to mitigation measures include:

- minor wording changes to AH2, AH3 and AH14
- clarification of actions in areas of archaeological sensitivity for the construction of the transmission line structures, creek crossings, accommodation facilities and compounds for revised AH5
- the EIS mitigation measures numbered AH5 and AH7 have been removed as this is now covered in the new and amended mitigation measures AH5, AH6 and AH7
- new mitigation measure AH6 has been added to clarify actions for the construction of new or upgraded access tracks
- new mitigation measure AH7 has been added to clarify the actions for the removal of root balls
- clarification of AH8 in response to Heritage NSW comment to ensure consultation is completed with RAPs regarding the salvage of trees
- additional wording added to AH9 stating sites may be moved rather than collected
- clarification of AH12 regarding unexpected finds and when this applies
- clarification of AH13 regarding the long-term management of salvaged artefacts and consultation with RAPs
- new mitigation measure AH15 has been added to ensure consultation is completed with RAPs regarding potential impacts from the upgrade of an existing access track through Derringullen Creek Women's Site.

The consolidated list of mitigation measures for the amended project is provided in Appendix B (Updated mitigation measures).

Table 6-11 Summary of revised and new Aboriginal heritage mitigation measures

Reference	Impact	Mitigation measure	Timing	Relevant location
AH2	Impact to Aboriginal sites	The finalisation of the project design and construction methodology, and associated final disturbance areas, will be developed to avoid harm to sites of moderate or above Aboriginal heritage significance as far as ~~practical~~ **practicable**. The objective is to further reduce potential impacts through **considered placement of** transmission line structure location**s** and design refinement of proposed infrastructure and **the associated** construction methodology. Avoidance and minimisation of harm to sites and **potential archaeological deposits (**PADs**)** will be prioritised.	Detailed design	All locations
AH3	Impact to Aboriginal sites in unassessed areas of the project footprint	Additional assessment will occur in accordance with the *Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW* (2010a) for areas where ground disturbing activities are required in locations outside of the previously assessed area. Where required, additional heritage surveys will be carried out with the **Registered Aboriginal Parties (**RAPs**)** prior to ground disturbing activities occurring in any such areas ~~**(including areas where only visual inspection has been undertaken)**~~. If no Aboriginal objects are found or if Aboriginal objects are found and they would not be impacted, then a letter report will be prepared by an archaeologist that documents the findings and gives clearance to proceed. Where Aboriginal objects, scarred trees or area**s** of **potential archaeological deposits (**PAD**s)** are located in unassessed areas and would be directly impacted, ~~**addendum**~~ report/s ~~**to *Technical Report 2 – Aboriginal Cultural Heritage Assessment Report***~~ will be prepared. The report/s will: • detail findings of the survey activities • detail where test excavation is required • outline any additional mitigation strategies beyond those required • be presented to the RAPs for comment. Final reports will be provided to RAPs and to Heritage NSW for their information prior to the commencement of ground disturbing activities in these locations.	Detailed design **and construction**	All locations ~~**(outside of the previously assessed area)**~~
~~**AH5**~~	~~**Impact to Aboriginal sites – PADs**~~	~~**An archaeological subsurface test excavation program will be carried out in parts of any PADs where project activities would have direct impact and a test excavation program has not already been completed in the area of impact. Direct impacts include grading of tracks and construction work sites, excavation for transmission line structure construction and tree removal that includes the root ball.**~~	~~**Detailed design**~~	~~**PAD areas not already tested**~~

Reference	Impact	Mitigation measure	Timing	Relevant location
~~AH6~~ AH5	Impacts ~~to~~ from construction of transmission line structures, new waterway crossings, worker accommodation facilities and construction compounds in areas of high and moderate Aboriginal archaeological sensitivity (subsurface archaeological sensitivity model)	Where detailed design confirms there would be direct impacts from the construction of transmission line structures, new waterway crossings, worker accommodation facilities and construction compounds in areas with high and moderate archaeological sensitivity that have not been previously subject to test excavations, prior to impact a desktop assessment and site inspection will be completed to determine the level of previous impact from past ground disturbing activities and to determine if the area contains a potential archaeological deposit (PAD). If it is determined that the area contains a PAD and has undergone low previous impact then an archaeological subsurface test excavation program will be carried out in the area of direct impact. ~~Direct impacts include grading of tracks and construction areas, excavation for transmission line structure construction and tree removal that includes the root ball.~~	Detailed design and construction	Areas of high and moderate sensitivity not already tested where project activities would have direct impact
~~AH7~~	~~Impacts to areas of moderate Aboriginal archaeological sensitivity~~	~~A field and desktop assessment will be completed in areas assessed as having moderate archaeological sensitivity where detailed design has confirmed project activities would have direct impact and a test excavation program has not already been completed in the area of impact. This is to determine the level of previous impact from past ground disturbing activities. If it is determined that the area has undergone low previous impact then an archaeological subsurface test excavation program will be carried out. Direct impacts include grading of tracks and construction areas, excavation for transmission line structure construction and tree removal that includes the root ball.~~	~~Detailed design~~	~~Areas of high and moderate sensitivity not already tested where project activities would have direct impact~~
AH6	Impacts from the construction of new or upgraded access tracks in areas of high and moderate Aboriginal archaeological sensitivity (model for predicting surface artefact scatters)	Following any stripping and grading works and prior to placement of any fill or road base material for construction of the access track, a site walkover will be completed and any surface artefacts will be recorded and moved off of the track. The artefact locations will be recorded as sites and then entered on the AHIMS database. The recording will include a record of their original location. Artefacts may be grouped into sites and the date provided to AHIMS accordingly.	Construction	Areas of high and moderate sensitivity not already tested where project activities would have direct impact

Reference	Impact	Mitigation measure	Timing	Relevant location
AH7	**Tree removal that includes the root ball in areas of high and moderate Aboriginal archaeological sensitivity (model for predicting surface artefact scatters)**	**Following the root ball removal in areas assessed as having high and moderate sensitivity, the area will be inspected and any surface artefacts will be recorded and moved away from the area of impact. The artefact locations will be recorded as sites and then entered on the AHIMS database.**	**Construction**	**Areas of high and moderate sensitivity not already tested where tree root ball removal would be undertaken**
AH8	Impact to Aboriginal sites – Modified/**scarred** trees	Harm to modified trees ~~**(including those of cultural significance)**~~ **and trees of cultural significance** will be avoided where possible through design development and construction planning. Modified trees will only be removed to directly facilitate construction of permanent infrastructure and/or to meet Vegetation Clearance Requirements for the transmission line. If the removal of a scarred tree (a type of modified tree)**, or a tree of cultural significance, that has been assessed to be an Aboriginal object** cannot be avoided, the tree will be subject to 3D scanning. ~~**Reports will be provided to RAPs and Heritage NSW. Following this, the scarred trunk will be salvaged.**~~ **Prior to any impacts to modified or scarred trees, or a tree of cultural significance, consultation will be undertaken with the Registered Aboriginal Parties (RAPs) on salvaging the scarred tree trunk.**	Detailed design	Modified/**scarred** trees
AH9	Impact to Aboriginal sites – Isolated Finds, Artefact scatters and **potential archaeological deposits (**PADs**) (moderate or high archaeological significance)**	All portions of artefact scatters and isolated finds **of moderate or high archaeological significance** that will be directly impacted will require surface collection ~~**and salvage**~~ **and/or movement** prior to construction commencement in those areas. ~~**Additionally, based on the outcomes of the test excavations, salvage excavations will occur in accordance with the Code of Practice.**~~ **Where test excavations identify archaeological deposits of moderate or high archaeological significance which cannot be avoided, salvage excavations will occur.**	Detailed design **and construction**	Directly impacted sites and PADs
AH12	Unexpected finds	If at any time during construction, any ~~**items of potential Aboriginal heritage archaeological significance**~~ **unanticipated Aboriginal objects (which are inconsistent with approved heritage impacts in T*echnical Report 2 – Revised Aboriginal Cultural Heritage Assessment Report*)**, or human remains are discovered, they will be managed in accordance with an unexpected finds protocol that is aligned with the protocol in Attachment 6 of *Technical Report 2 – **Revised** Aboriginal Cultural Heritage Assessment Report*.	Construction	All locations

Reference	Impact	Mitigation measure	Timing	Relevant location
AH13	~~**Retrieved**~~ **Salvaged** archaeological material	**The long-term management of** ~~**Retrieved**~~ **salvaged** archaeological materials will be ~~**stored in appropriate facilities confirmed**~~ **determined** in consultation with the **Registered Aboriginal Parties (**RAPs**)**.	Construction	As relevant
AH14	Post construction impacts to heritage items by maintenance activities	Sites of heritage significance that would remain in-situ within the transmission line easement, **at substation locations** and along access tracks will be mapped and recorded within GIS systems managed by Transgrid to reduce the potential for inadvertent impacts which may occur during maintenance activities.	Operation	Transmission line, substations and access tracks
AH15	**Impacts from the upgrade of existing access track through Derringullen Creek Women's Site**	**If impacts to the Derringullen Creek Women's Site cannot be avoided during further detailed design and construction planning, further consultation with the relevant Registered Aboriginal Party (RAP) will be undertaken to seek guidance around minimising and managing the extent of impacts.**	**Detailed design and construction**	**Derringullen Creek Women's Site**

6.4. Non-Aboriginal heritage

6.4.1. Approach to assessment

Technical Report 3 - Historic Heritage Impact Assessment Addendum assesses the potential historic heritage (also referred to as non-Aboriginal heritage) impacts from the proposed amendments and refinements of the project.

There has been no change to the legislative and policy context presented in *Technical Report 3 – Historic Heritage Impact Assessment* prepared for the EIS.

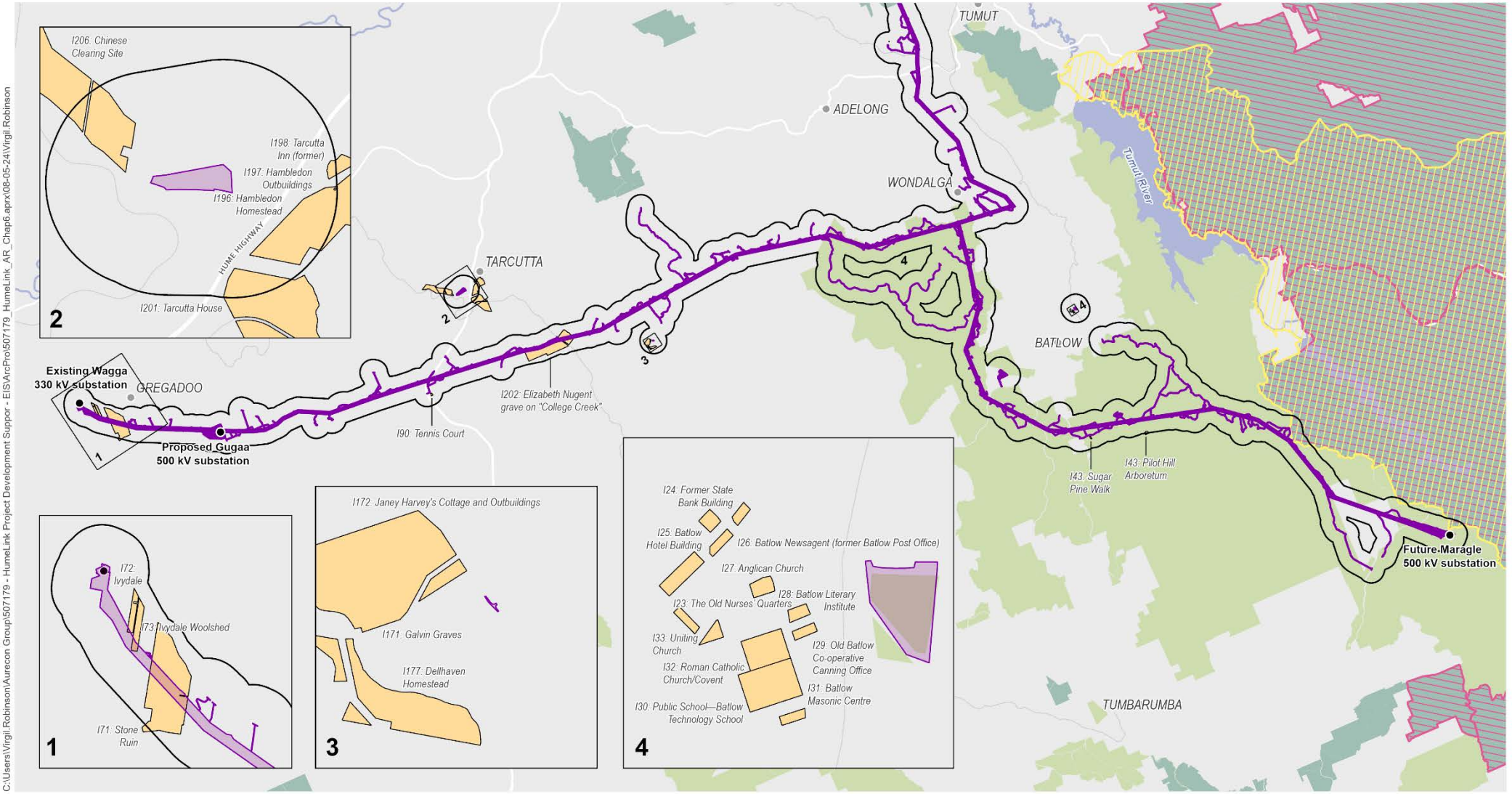
The assessment of the amendments and refinements has been prepared in accordance with the assessment approach methodology outlined within *Technical Report 3 – Historic Heritage Impact Assessment*.

The non-Aboriginal heritage study area was updated to capture the amended project footprint (as outlined in Chapter 3 (Description of the amended project) including a one kilometre wide buffer either side (refer to Figure 6-3).

The assessment of the proposed amendments and refinements included:

- additional field survey carried out between September and October 2023 to inspect the non-Aboriginal heritage study area across accessible properties
- review of findings from additional survey work
- review of literature and relevant databases (for heritage listings under Local Environmental Plans (LEP), State Heritage Register (SHR), Register of the National Estate (RNE) and National Heritage List (NHL)) in October 2023 for the amended non-Aboriginal heritage study area.

Figure 6-3 shows the amended non-Aboriginal heritage study area, amended project footprint and heritage listed items within the amended non-Aboriginal heritage study area.



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Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-3a: Amended non-Aboriginal heritage study area and amended project footprint with heritage listed items

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Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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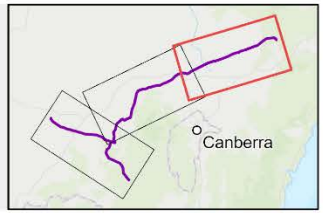
Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-3b: Amended non-Aboriginal heritage study area and amended project footprint with heritage listed items

Amended project footprint
Amended non-Aboriginal heritage study area
National park and reserve
State forest
Waterway
Major road
Railway
Substation
Potential historic site
LEP listed item
RNE listed item
LEP and RNE listed item
LEP and SHR listed item



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:300,000
0 7 14 km

Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-3c: Amended non-Aboriginal heritage study area and amended project footprint with heritage listed items

6.4.2. Assessment of amendments and refinements

6.4.2.1. Construction impacts

There are two heritage items of local significance (Ivydale and Coolalie limestone kilns and quarry) within the amended project footprint. These items were located in the non-Aboriginal heritage study area presented in *Technical Report 3 - Historic Heritage Impact Assessment* prepared for the EIS. The heritage curtilages of the two locally listed heritage items are now within the amended project footprint, these sites are described in Table 6-12. The assessment found that the amended project footprint intersecting the curtilages of these sites would not directly impact the heritage significance of any items associated with the heritage listings. In addition, one item previously assessed in the EIS has new impacts (Derringullen Creek Fossil Area) as a result of the amendments and refinements.

Table 6-12 presents the revised impacts as a result of the amendments and refinements and excludes the non-Aboriginal heritage items and historic sites where the impact remains the same as the EIS.

Table 6-12 Impact assessment of non-Aboriginal heritage items as a result of amendments and refinements during construction

Site name	Heritage significance	Impact to item	Would the amended project impact the heritage significance of an item?
Coolalie Limestone kilns and Quarry	Local	A new access track proposed as part of the amended project is located within the north-east corner of the heritage curtilage of the site. The historic item itself would not be impacted and there would be no direct impacts to the item.	No
Ivydale	Local	The property was previously not within the EIS project footprint and was within the non-Aboriginal heritage study area only. The southern end of the heritage curtilage is now located within the amended project footprint and the building associated with the listing is approximately 800 m north of the amended project footprint. The amended project footprint intersects the curtilage of this site and would not directly impact the heritage significance of the item. Furthermore, as there is an existing transmission line in the area, there is no additional indirect (visual) impact.	No
Derringullen Creek Fossil Area	Local and registered on the RNE[1]	Derringullen Creek Fossil Area was assessed in the EIS as the RNE curtilage was intersected by the project footprint (transmission line corridor). For the amended project, both the LEP and RNE curtilages of the item would now be traversed through the use of existing access tracks.	No

Note:

1 The heritage curtilages for both listings overlap but are not the same, as the RNE curtilage is larger than the LEP listed curtilage.

An additional State heritage listed item (Hambledon Homestead SHR 00351) and 18 locally heritage listed items are within the amended non-Aboriginal heritage study area, however these items are outside of the amended project footprint. In addition, there has been no change to the impacts described in the EIS on the two places on the National Heritage List partly within the amended non-Aboriginal heritage study area, but not within the amended project footprint: the Australian Alps National Parks and Reserves and the Snowy Mountains Scheme. Additionally, as described in the EIS, the amended project has been determined to be a controlled action with respect to potential impacts on National Heritage places, refer to Section 6.3 for

potential impacts on the Bogong moth, which is listed as having Indigenous cultural values as part of the Australian Alps National Parks National Heritage Listing.

Table 6-13 summarises the 19 additional heritage items as well as the revised impacts to non-Aboriginal heritage items and historic sites which were assessed in the EIS. These non-Aboriginal heritage items and historic sites are within the non-Aboriginal heritage study area and outside the amended project footprint. Further, Table 6-13 excludes the non-Aboriginal heritage items and historic sites where the impact remains the same as the EIS.

Table 6-13 Impact assessment of non-Aboriginal heritage items within the non-Aboriginal heritage study area outside the amended project footprint as a result of amendments and refinements during construction

Site name	Heritage significance	Distance from amended project footprint	Impact to item	Would the amended project impact the heritage significance of an item?
Snowy Mountains Scheme	National	80 m	The amended project footprint is located in proximity to this item. There may be an indirect visual impact from the amended project on this item from vegetation clearance and the proximity of transmission line structures. The Snowy Mountains Scheme is strongly symbolic for large parts of the Australian community due to its key historical events, people and engineering significance. None of the heritage values associated with this item would be impacted. The closest amended project component is the transmission line corridor.	No
Australian Alps National Parks and Reserves	National	15 m	The amended project footprint is located in proximity to this item. This is consistent with the EIS. There may be an indirect visual impact from the amended project on this item from vegetation clearance and the proximity of transmission line structures located at a distance of 100 m from the nearest point of this item. The closest amended project component are existing access tracks that are proposed to be used for the amended project.	Negligible
Hillas Farm Homestead and Outbuildings	State	100 m	There would be no direct impact to this item from the amended project. As outlined within *Technical Report 8 – Landscape Character and Visual Impact Assessment* of the EIS, there would be partially obstructed views from the State heritage item to the transmission line corridor portion of the project footprint resulting in a moderate to low visual impact. The closest amended project component is an access track.	Negligible
Hambledon Homestead	State	360 m	There would be no impact to this item from the amended project. The closest amended project component is the Tarcutta accommodation facility and compound (AC03).	No
Hambledon Outbuildings	Local	360 m	There would be no impact to this item from the amended project. The closest amended project component is the Tarcutta accommodation facility and compound (AC03).	No
Bannaby Shearing Shed c.1886	Local	660 m	There would be no impact to this item from the amended project. The closest amended project component is an access track.	No

Site name	Heritage significance	Distance from amended project footprint	Impact to item	Would the amended project impact the heritage significance of an item?
Tarcutta Inn (former)	Local	930 m	There would be no impact to this item from the amended project. The closest amended project component is the Tarcutta accommodation facility and compound (AC03).	No
Chinese Clearing site	Local	274 m	There would be no impact to this item from the amended project. The closest amended project component is the Tarcutta accommodation facility and compound (AC03).	No
Tarcutta House	Local	790 m	There would be no impact to this item from the amended project. The closest amended project component is the Tarcutta accommodation facility and compound (AC03).	No
Galvin Graves	Local	130 m	There would be no impact to this item from the amended project. The closest amended project component is an intersection upgrade.	No
Janey Harvey's Cottage and Outbuilding	Local	130 m	There would be no impact to this item from the amended project. The closest amended project component is an intersection upgrade.	No
Dellhaven Homestead	Local	390 m	There would be no impact to this item from the amended project. The closest amended project component is an intersection upgrade.	No
Yass Junction Railway Station	Local	880 m	There would be no impact to this item from the amended project. The closest amended project component is the Yass substation compound (C10).	No
Yass railway weir	Local	372 m	There would be no impact to this item from the amended project. The closest amended project component is the Yass substation compound (C10).	No
Albury villa	Local	983 m	There would be no impact to this item from the amended project. The closest amended project component is the Yass substation compound (C10).	No
Sugar Pine Walk	Local	15 m	There would be no impact to this item from the amended project as this item was irreparably damaged in the 2020 bushfires. The closest amended project component is existing access tracks to be used for the amended project.	No
Pilot Hill Arboretum	Local	890 m	There would be no impact to this item from the amended project. The closest amended project component are the transmission line structures.	No
Gilmore School	Local	65 m	There would be no impact to this item from the amended project. The closest amended project component is an existing access track to be used for the amended project.	No
Gilmore Hall	Local	880 m	There would be no impact to this item from the amended project. The closest amended project component is an existing access track to be used for the amended project.	No

Site name	Heritage significance	Distance from amended project footprint	Impact to item	Would the amended project impact the heritage significance of an item?
Gilmore Church	Local	930 m	There would be no impact to this item from the amended project. The closest amended project component is an existing access track to be used for the amended project.	No
Gadara Homestead (Downing Homestead)	Local	270 m	There would be no impact to this item from the amended project. The closest amended project component is an existing access track to be used for the amended project.	No
Gocup School and residence	Local	730 m	There would be no impact to this item from the amended project. The closest amended project component is an existing access track to be used for the amended project.	No

6.4.2.2. Operational impacts

The assessment of operational impacts on non-Aboriginal heritage items for the amended project remains unchanged from the EIS.

6.4.3. Updated mitigation measures

The approach to the avoidance/minimisation and management of non-Aboriginal heritage impacts remains consistent with the description in Chapter 10 (Non-Aboriginal heritage) of the EIS. However, minor amendments have been made to NAH2 to manage the impacts to locations outside the previously surveyed heritage survey area, refer to Table 6-14. The updates are shown in **green** and ~~**strikethrough**~~ in Table 6-14. The consolidated list of mitigation measures for the amended project is provided in Appendix B (Updated mitigation measures).

Table 6-14 Summary of revised non-Aboriginal heritage mitigation measures

Reference	Impact	Mitigation measure	Timing	Relevant location
NAH2	Impact to unsurveyed areas	**Additional assessment will occur in areas where ground disturbing activities are required in locations outside of the previously surveyed heritage survey area.** Additional heritage surveys will be carried out prior to ground disturbing activities **occurring** in **any such** areas **(including areas ~~which were previously inaccessible and/or~~** where only visual inspection has been undertaken**)**. **~~Whether or not~~ If no** historic items are found **or if historic items are found and they would not be impacted**, **then** a letter report will be prepared by a heritage specialist **~~for all additional surveyed areas~~** that documents the findings **and gives clearance to proceed**. Where historic items are located and would be impacted, a **~~draft survey addendum report(s) to this~~** report will be prepared for the survey areas. The report(s) will: • detail findings of the survey activities • detail where test excavation is required • outline any additional mitigation strategies beyond those required **in Appendix B (Updated mitigation measures) of the Amendment Report.** Final reports will be provided **to** Heritage NSW for their information prior to the commencement of ground disturbing activities in these locations.	Detailed design	All locations (outside of the previously surveyed heritage survey area)

6.5. Land use and property

6.5.1. Approach to assessment

The land use and property impact assessment has been prepared in accordance with the assessment approach and methodology outlined within *Technical Report 5 – Land Use and Property Impact Assessment* prepared for the EIS and focuses on changes to impacts described in the EIS. The assessment also includes the agricultural impacts from *Technical Report 4 – Agricultural Impact Assessment Addendum.*

In alignment with the impact assessment principles of the NSW Department of Industries' *Land Use Conflict Risk Assessment Guide* (LUCRA Guide) (2011), the land use and property impact assessment has considered:

- changes to land use and property impacts associated with the construction of the amended project
- changes to land use and property impacts associated with the operation of the amended project
- changes to mitigation and management measures to minimise land use and property impacts of the amended project.

There has been no change to the legislative and policy context presented in *Technical Report 5 – Land Use and Property Impact Assessment* and *Technical Report 4 – Agricultural Impact Assessment* prepared for the EIS as a result of the amended project.

There has been no change to the land use and property study area compared to the EIS as this sufficiently covers the area surrounding the amended project footprint and consists of the combined area of the Wagga Wagga City, Snowy Valleys, Cootamundra-Gundagai Regional, Upper Lachlan Shire and Yass Valley LGAs.

The agricultural study area has been amended to include the amended project footprint and a buffer of 1.5 kilometres encompassing the agricultural areas likely to be directly and indirectly affected by the amended project (refer to *Technical Report 4 – Agricultural Impact Assessment Addendum* for figures in Attachments 1 to 4).

The loss of land or change in land use may be perceived and experienced differently by different people and could result in environmental, economic and/or social impacts. This chapter presents a quantitative assessment of land area impacted by the amended project focusing on the amendments and refinements since the EIS. Further assessment of economic impacts is outlined within Section 6.6 and social impacts are outlined in Section 6.7.

Updated land use classification for amended project footprint during construction

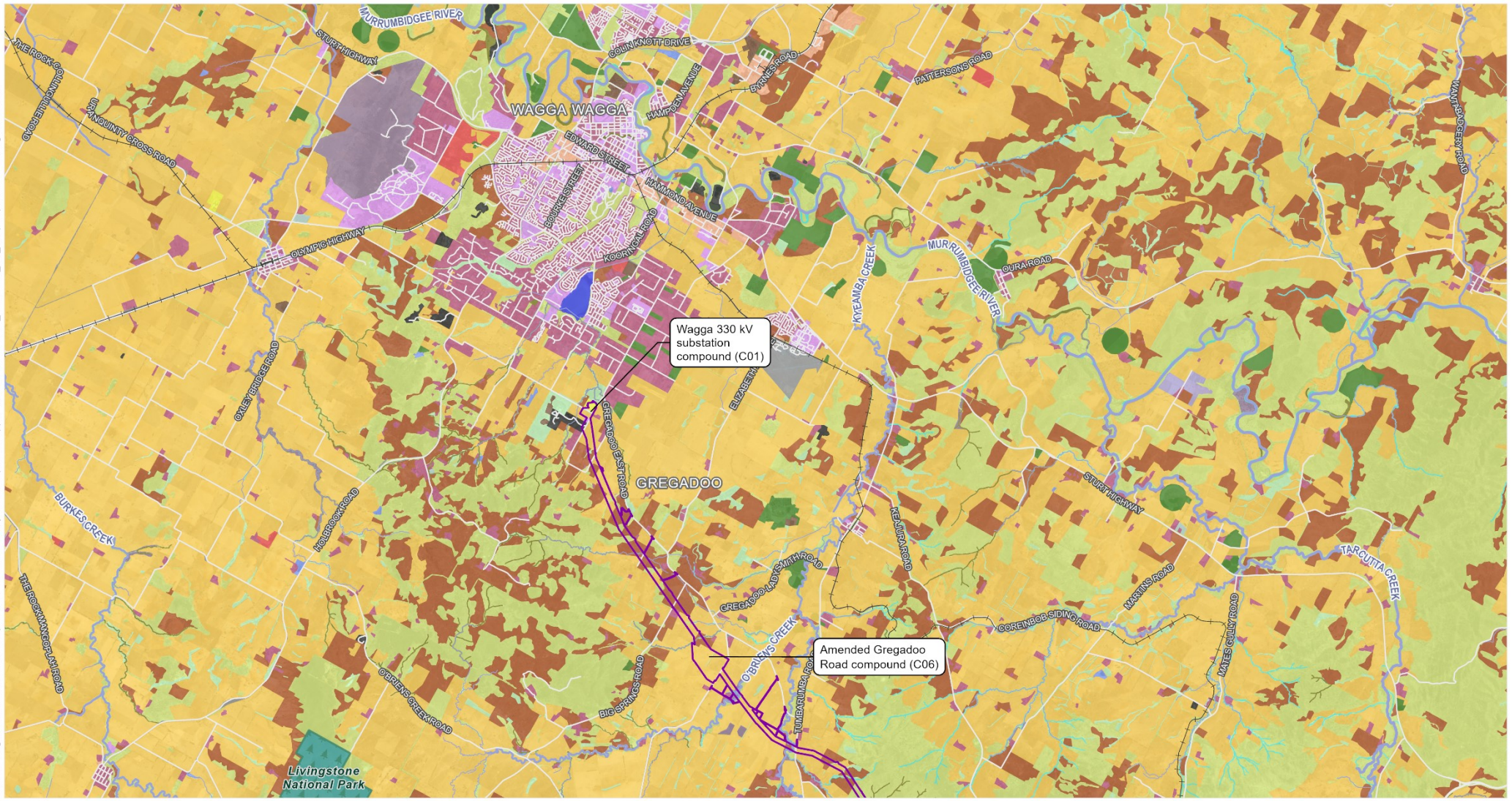
Table 6-15 provides a summary of the land uses in the amended project footprint during construction based on the Australian Land Use and Management (ALUM) classification system (Australian Bureau of Agricultural and Resource Economics and Sciences, 2016).

Figure 6-4 shows an overview of the land uses within and surrounding the amended project footprint.

Table 6-15 Summary of land use classes in the amended project footprint during construction and comparison to the EIS (indicative, subject to further design development)

Land use	Land and property study area	EIS project footprint	Amended project footprint	Difference in hectares compared with EIS	% of total land use across land use and property study area	
	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Amended project footprint	Difference compared with EIS
Natural environment						
1.2.0 Managed resource protection	10,543	26.4	32.0	5.6	0.3%	<0.1%
1.3.0 Other minimal use	6,751	6.4	7.6	1.2	0.1%	<0.1%
Sub-total for natural environment	**17,294**	**33**	**40**	**+7**	**0.2%**	**<0.1%**
Agriculture and primary production						
Agricultural land use						
2.1.0 Grazing native vegetation	698,533	2,171.9	2,097.4	-74.5	0.3%	<-0.1%
3.2.0 Grazing modified pastures	855,829	4,200.1	3,786.4	-413.7	0.4%	-0.1%
3.3.0 Cropping	469,306	802.2	920.8	118.6	0.2%	<0.1%
3.6.0 Land in transition	595	3.3	0.3	-3	<0.1%	-0.6%
4.4.0 Irrigated perennial horticulture	2,730	4.1	16.1	12	0.6%	+0.4%
Sub-total Agriculture	**2,026,993**	**7,182**	**6,821**	**-361**	**0.3%**	**<-0.1%**
Forestry land use						
2.2.0 Production native forestry	212,683	1,067.1	1,700.6	633.5	0.8%	0.3%
3.1.0 Plantation forests	32,797	21.5	27.4	5.9	0.1%	<0.1%
Sub-total Forestry	**245,480**	**1,089**	**1,728**	**+639**	**0.7%**	**0.3%**
Sub-total Agriculture and primary production	**2,272,473**	**8,270**	**8,549**	**+279**	**0.4%**	**<0.1%**

Land use	Land and property study area	EIS project footprint	Amended project footprint	Difference in hectares compared with EIS	% of total land use across land use and property study area	
	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Amended project footprint	Difference compared with EIS
Urban						
5.3.0 Manufacturing and industrial	1,023	0.1	1.5	1.4	0.1%	<0.1%
5.4.0 Residential and farm infrastructure	50,715	14.0	26.9	12.9	<0.1%	<0.1%
5.5.0 Services	4,097	4.3	4.4	0.1	0.1%	<0.1%
Sub-total Urban	**55,835**	**18**	**33**	**+14**	**<0.1%**	**<0.1%**
Infrastructure and utilities						
5.6.0 Utilities	363	57.3	60.5	3.2	16.7%	0.9%
5.7.0 Transport and communication	12,329	8.4	16.2	7.8	0.1%	<0.1%
5.9.0 Waste treatment and disposal	392	5.7	0.0	-5.7	0.0%	-1.5%
Sub-total infrastructure and utilities	**13,084**	**71.4**	**76.7**	**+5.3**	**0.6%**	**<0.1%**
Extractive industries						
5.8.0 Mining	1,062	3.6	3.7	0.1	0.3%	<0.1%
Water						
6.1.0 Lake	14,962	5.3	5.3	0	<0.1%	0.0%
6.2.0 Reservoir/dam	1,158	0.5	0.5	0	<0.1%	<0.1%
6.3.0 River	43,329	124.6	104.5	-20.1	0.2%	<-0.1%
6.5.0 Marsh/wetland	8,182	23.7	23.0	-0.7	0.3%	<0.1%
Sub-total water	**67,631**	**154**	**133**	**-21**	**0.2%**	**<-0.1%**
Total all land use categories	**2,921,763**	**8,551**	**8,835**	**+284**	**0.3%**	**<0.1%**



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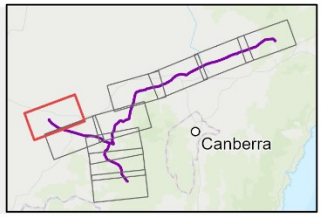
Amended project footprint
National park and reserve
Waterway
Railway

Land Use 2017

- 1.1.0 Nature conservation
- 1.2.0 Managed resource protection
- 1.3.0 Other minimal use
- 2.1.0 Grazing native vegetation
- 3.1.0 Plantation forests
- 3.2.0 Grazing modified pastures
- 3.3.0 Cropping
- 3.6.0 Land in transition
- 4.4.0 Irrigated perennial horticulture
- 5.3.0 Manufacturing and industrial
- 5.4.0 Residential and farm infrastructure
- 5.5.0 Services
- 5.6.0 Utilities
- 5.7.0 Transport and communication
- 5.8.0 Mining
- 5.9.0 Waste treatment and disposal
- 6.1.0 Lake
- 6.2.0 Reservoir/dam
- 6.3.0 River
- 6.5.0 Marsh/wetland
- Other agricultural and primary production land use classes



Source: *Aurecon, Transgrid, DPE, Spatial Services (DCS), ESRI Basemap*

1:150,000
0 3 6km

Projection: GDA 1994 MGA Zone 55

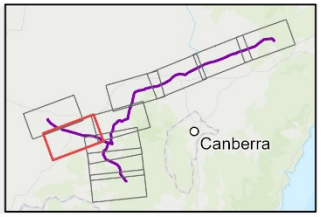
HumeLink

FIGURE 6-4a: Land uses within and surrounding the amended project footprint

Amended project footprint
National park and reserve
State forest
Waterway
Railway

Land Use 2017

- 1.1.0 Nature conservation
- 1.2.0 Managed resource protection
- 1.3.0 Other minimal use
- 2.1.0 Grazing native vegetation
- 2.2.0 Production native forestry
- 3.1.0 Plantation forests
- 3.2.0 Grazing modified pastures
- 3.3.0 Cropping
- 4.4.0 Irrigated perennial horticulture
- 5.3.0 Manufacturing and industrial
- 5.4.0 Residential and farm infrastructure
- 5.5.0 Services
- 5.7.0 Transport and communication
- 5.8.0 Mining
- 6.2.0 Reservoir/dam
- 6.3.0 River
- 6.5.0 Marsh/wetland
- Other agricultural and primary production land use classes



Source: *Aurecon, Transgrid, DPE, Spatial Services (DCS), ESRI Basemap*

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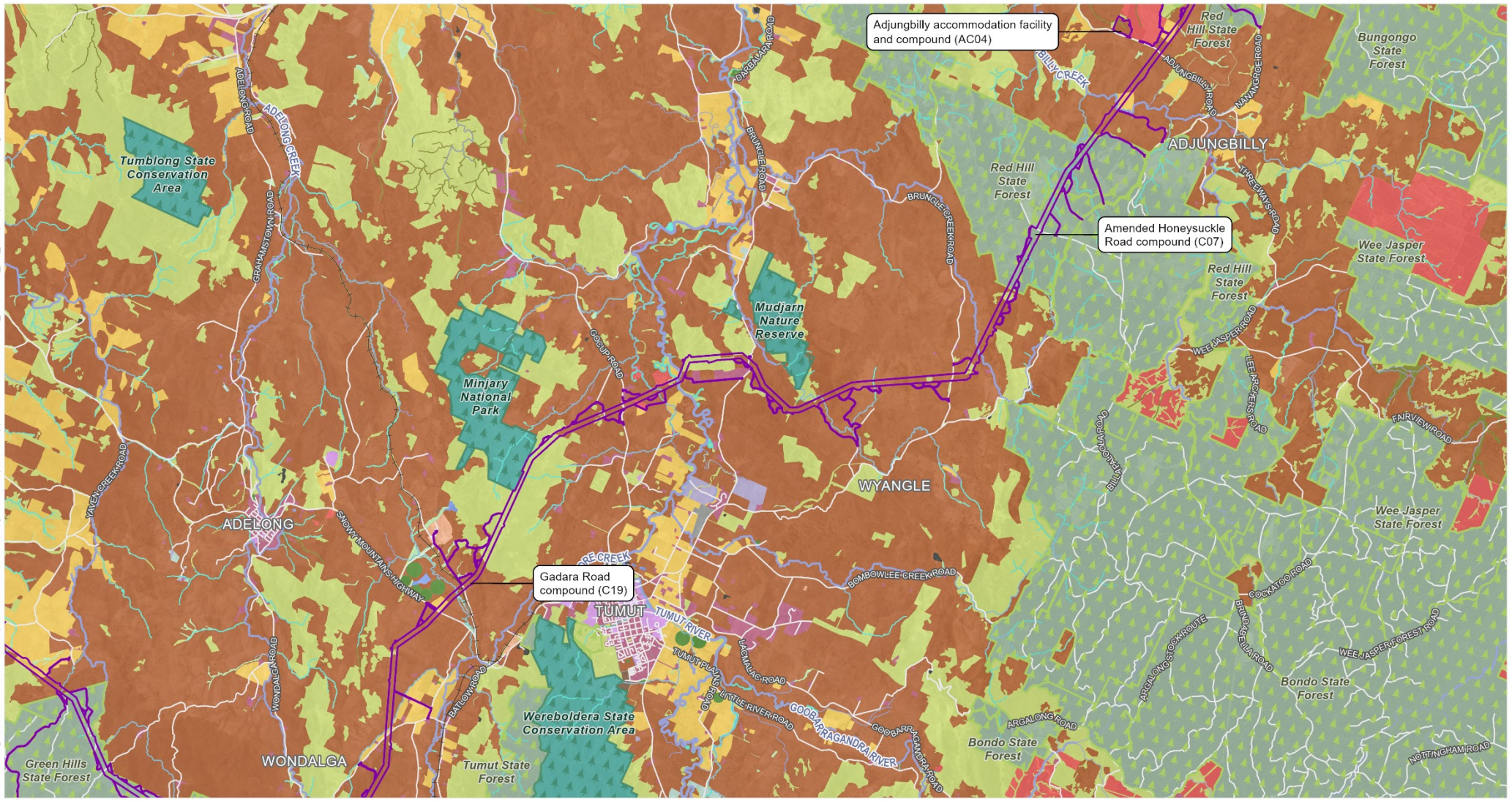
0 3 6 km

Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-4b: Land uses within and surrounding the amended project footprint



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Source: *Aurecon, Transgrid, DPE, Spatial Services (DCS), ESRI Basemap*

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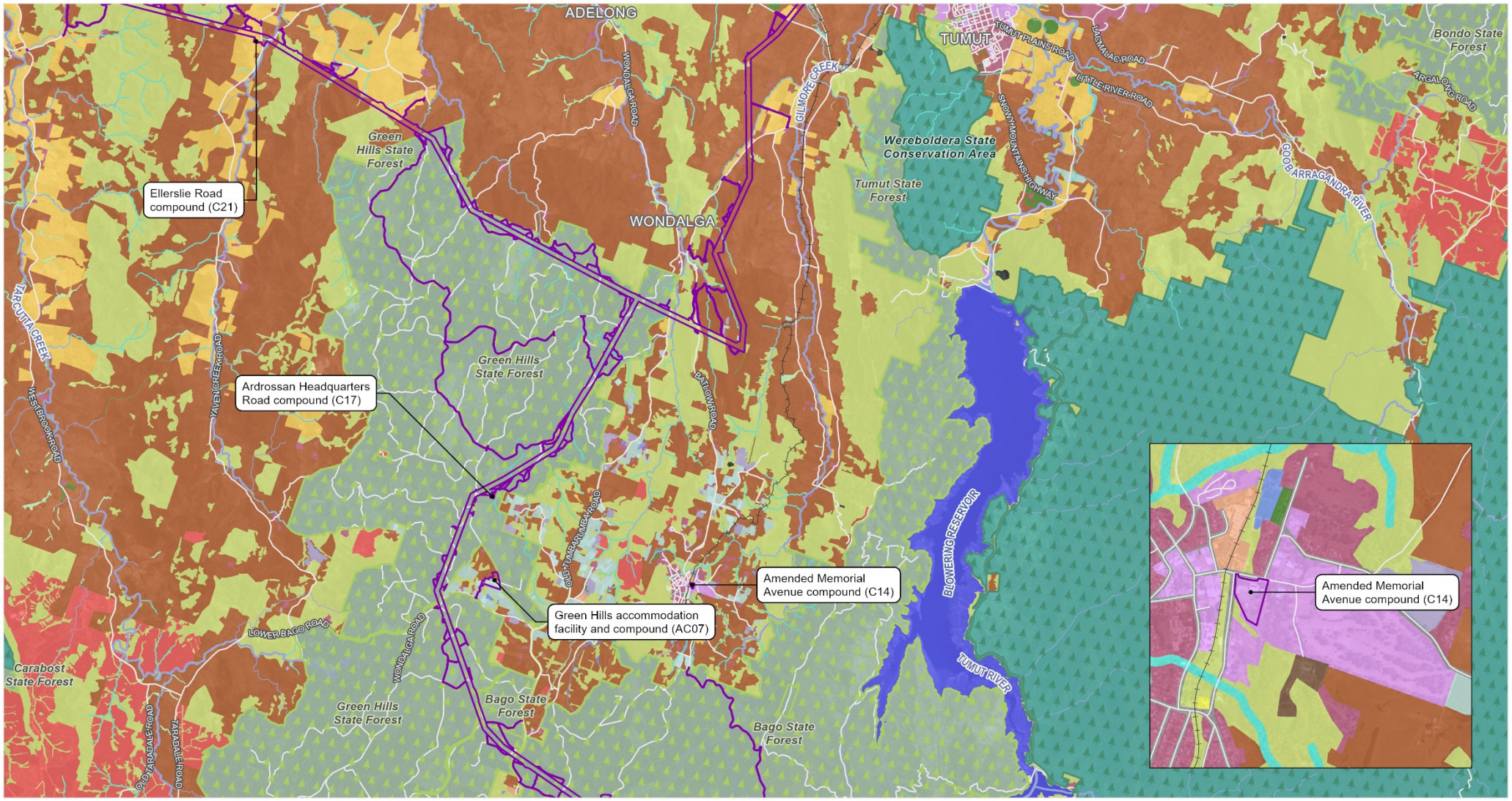
Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-4c: Land uses within and surrounding the amended project footprint



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Source: *Aurecon, Transgrid, DPE, Spatial Services (DCS), ESRI Basemap*

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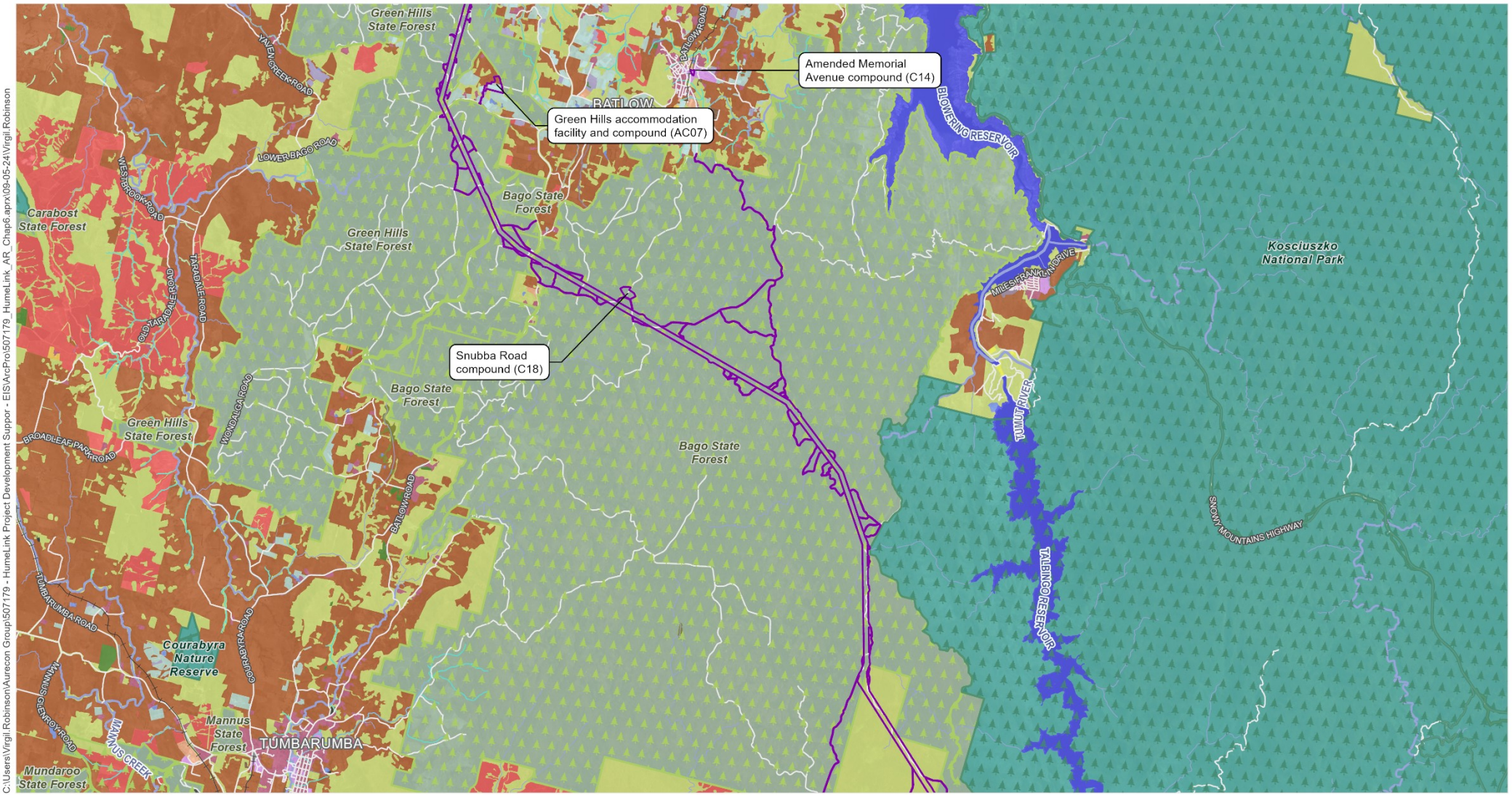
0 3 6km

Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-4d: Land uses within and surrounding the amended project footprint



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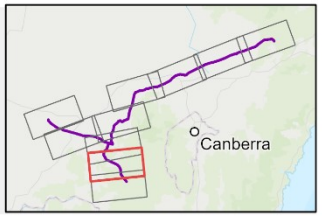
Amended project footprint
National park and reserve
State forest
Waterway
Railway

Land Use 2017

1.1.0 Nature conservation
1.2.0 Managed resource protection
1.3.0 Other minimal use
2.1.0 Grazing native vegetation
2.2.0 Production native forestry
3.1.0 Plantation forests
3.2.0 Grazing modified pastures
3.3.0 Cropping
3.6.0 Land in transition
4.4.0 Irrigated perennial horticulture
5.3.0 Manufacturing and industrial
5.4.0 Residential and farm infrastructure
5.5.0 Services
5.6.0 Utilities
5.7.0 Transport and communication
5.8.0 Mining
5.9.0 Waste treatment and disposal
6.1.0 Lake
6.2.0 Reservoir/dam
6.3.0 River
6.5.0 Marsh/wetland
Other agricultural and primary production land use classes



Source: *Aurecon, Transgrid, DPE, Spatial Services (DCS), ESRI Basemap*

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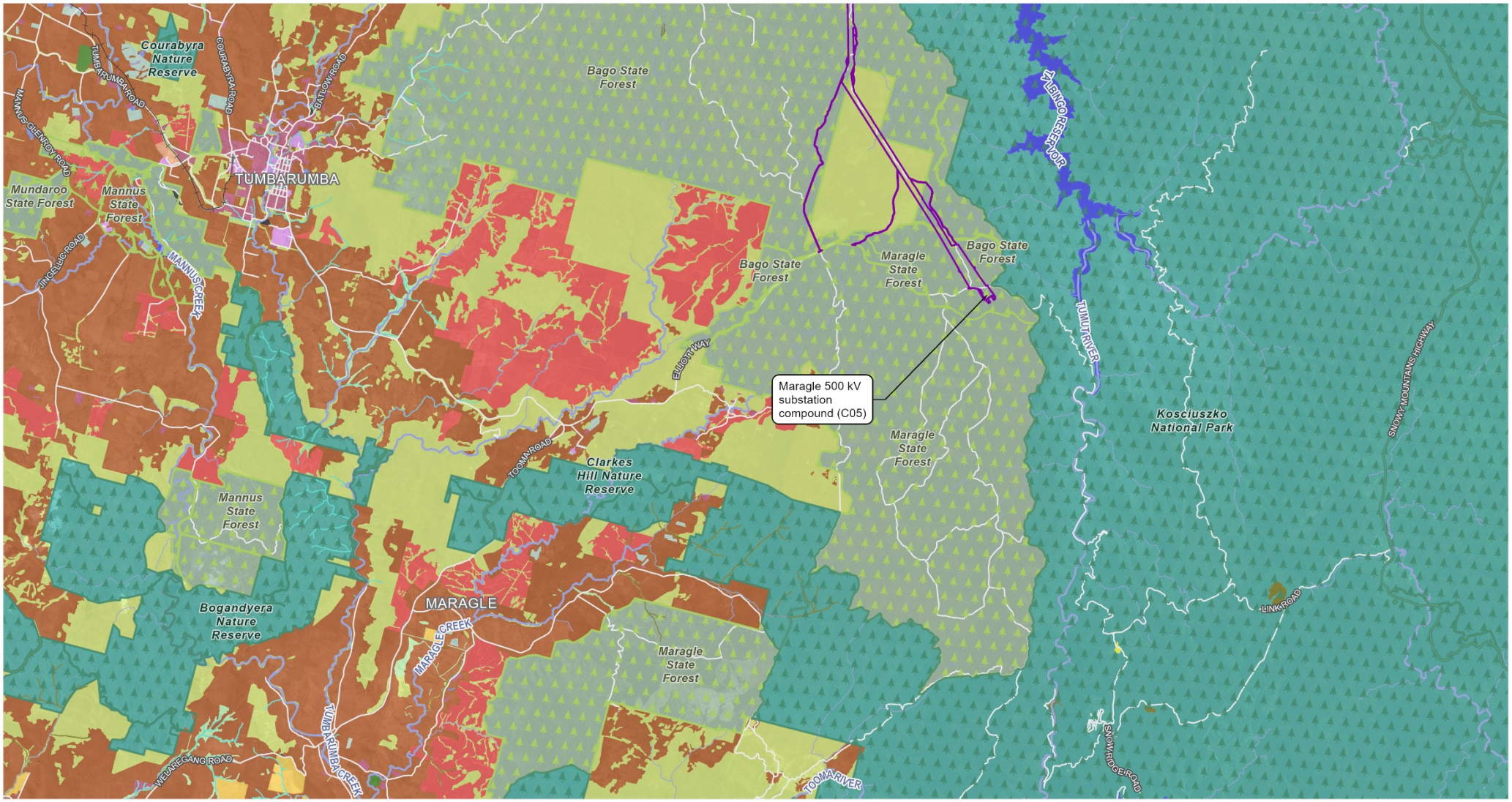
0 3 6km

Projection: GDA 1994 MGA Zone 55

HumeLink

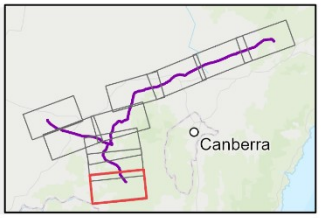
FIGURE 6-4e: Land uses within and surrounding the amended project footprint



Amended project footprint
National park and reserve
State forest
Waterway
Railway

Land Use 2017

1.1.0 Nature conservation
1.2.0 Managed resource protection
1.3.0 Other minimal use
2.1.0 Grazing native vegetation
2.2.0 Production native forestry
3.1.0 Plantation forests
3.2.0 Grazing modified pastures
3.3.0 Cropping
3.6.0 Land in transition
4.4.0 Irrigated perennial horticulture
5.3.0 Manufacturing and industrial
5.4.0 Residential and farm infrastructure
5.5.0 Services
5.6.0 Utilities
5.7.0 Transport and communication
5.8.0 Mining
5.9.0 Waste treatment and disposal
6.1.0 Lake
6.2.0 Reservoir/dam
6.3.0 River
6.5.0 Marsh/wetland
Other agricultural and primary production land use classes



Source: *Aurecon, Transgrid, DPE, Spatial Services (DCS), ESRI Basemap*

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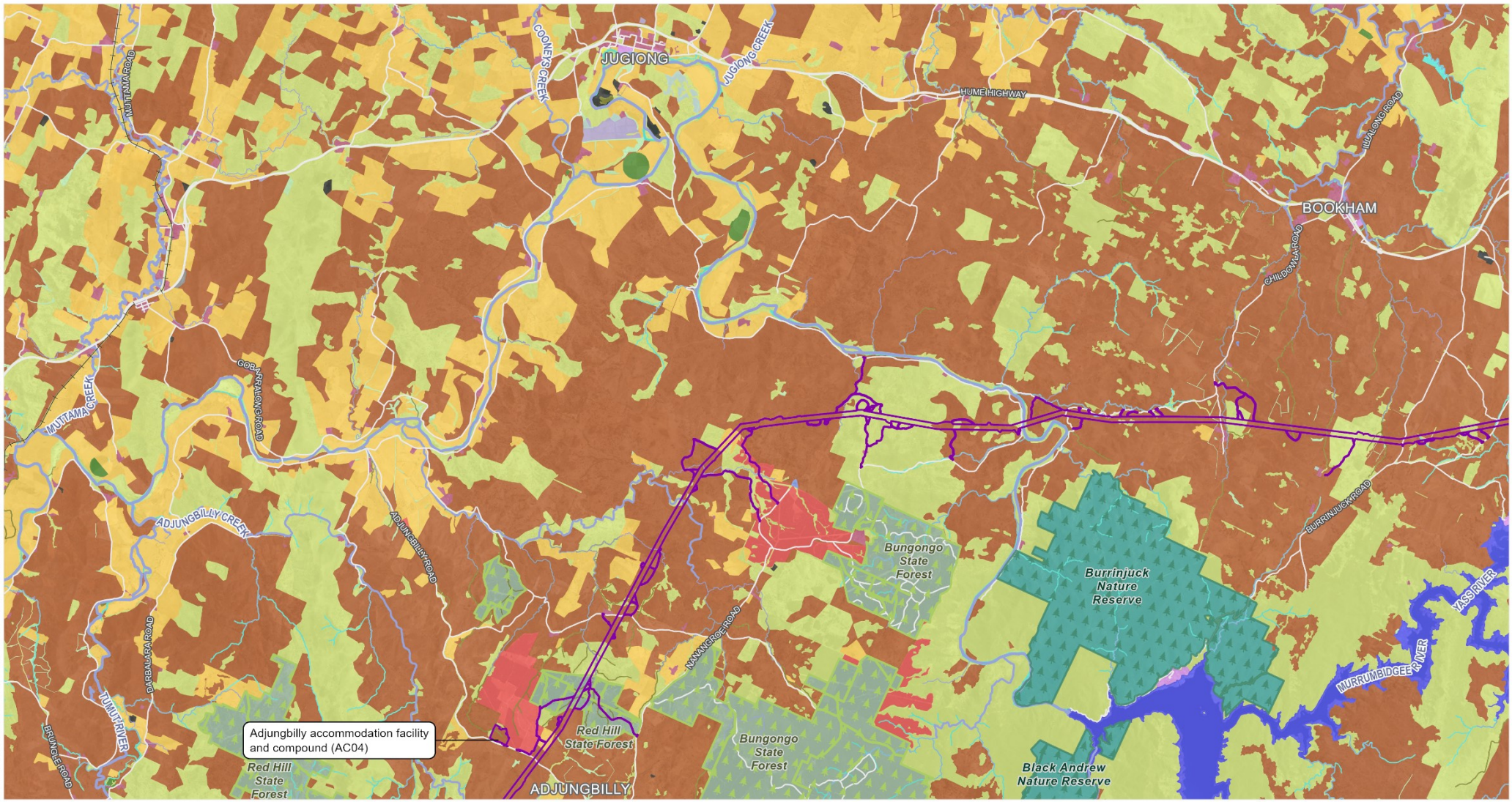
Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-4f: Land uses within and surrounding the amended project footprint



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Source: *Aurecon, Transgrid, DPE, Spatial Services (DCS), ESRI Basemap*

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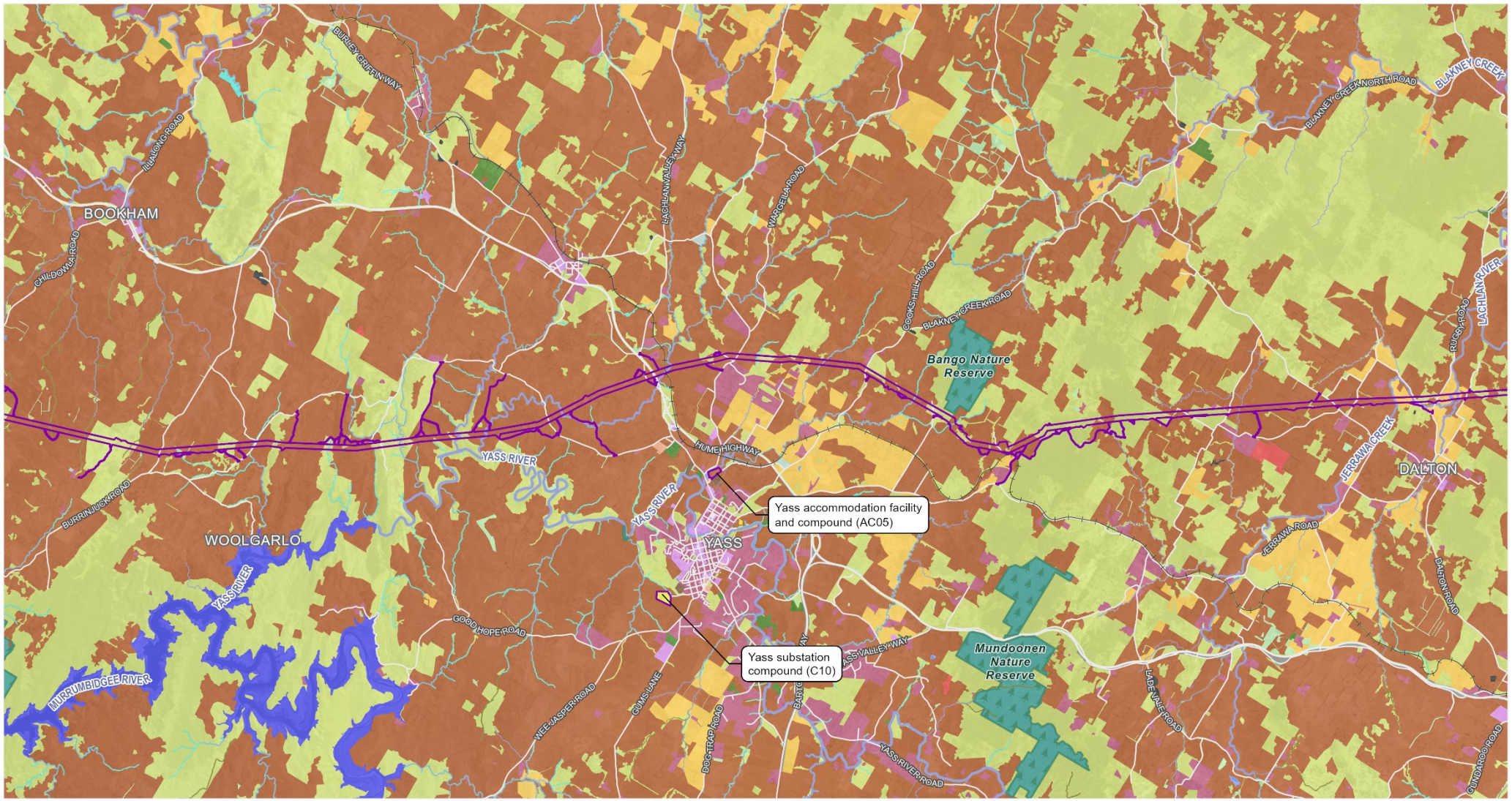
0 3 6 km

Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-4g: Land uses within and surrounding the amended project footprint



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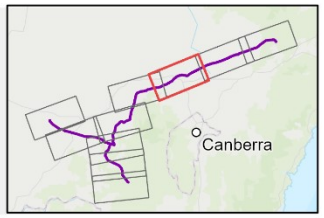
Amended project footprint
National park and reserve
Waterway
Railway

Land Use 2017

- 1.1.0 Nature conservation
- 1.2.0 Managed resource protection
- 1.3.0 Other minimal use
- 2.1.0 Grazing native vegetation
- 3.1.0 Plantation forests
- 3.2.0 Grazing modified pastures
- 3.3.0 Cropping
- 4.4.0 Irrigated perennial horticulture
- 5.3.0 Manufacturing and industrial
- 5.4.0 Residential and farm infrastructure
- 5.5.0 Services
- 5.6.0 Utilities
- 5.7.0 Transport and communication
- 5.8.0 Mining
- 5.9.0 Waste treatment and disposal
- 6.1.0 Lake
- 6.2.0 Reservoir/dam
- 6.3.0 River
- 6.5.0 Marsh/wetland
- Other agricultural and primary production land use classes



Source: *Aurecon, Transgrid, DPE, Spatial Services (DCS), ESRI Basemap*

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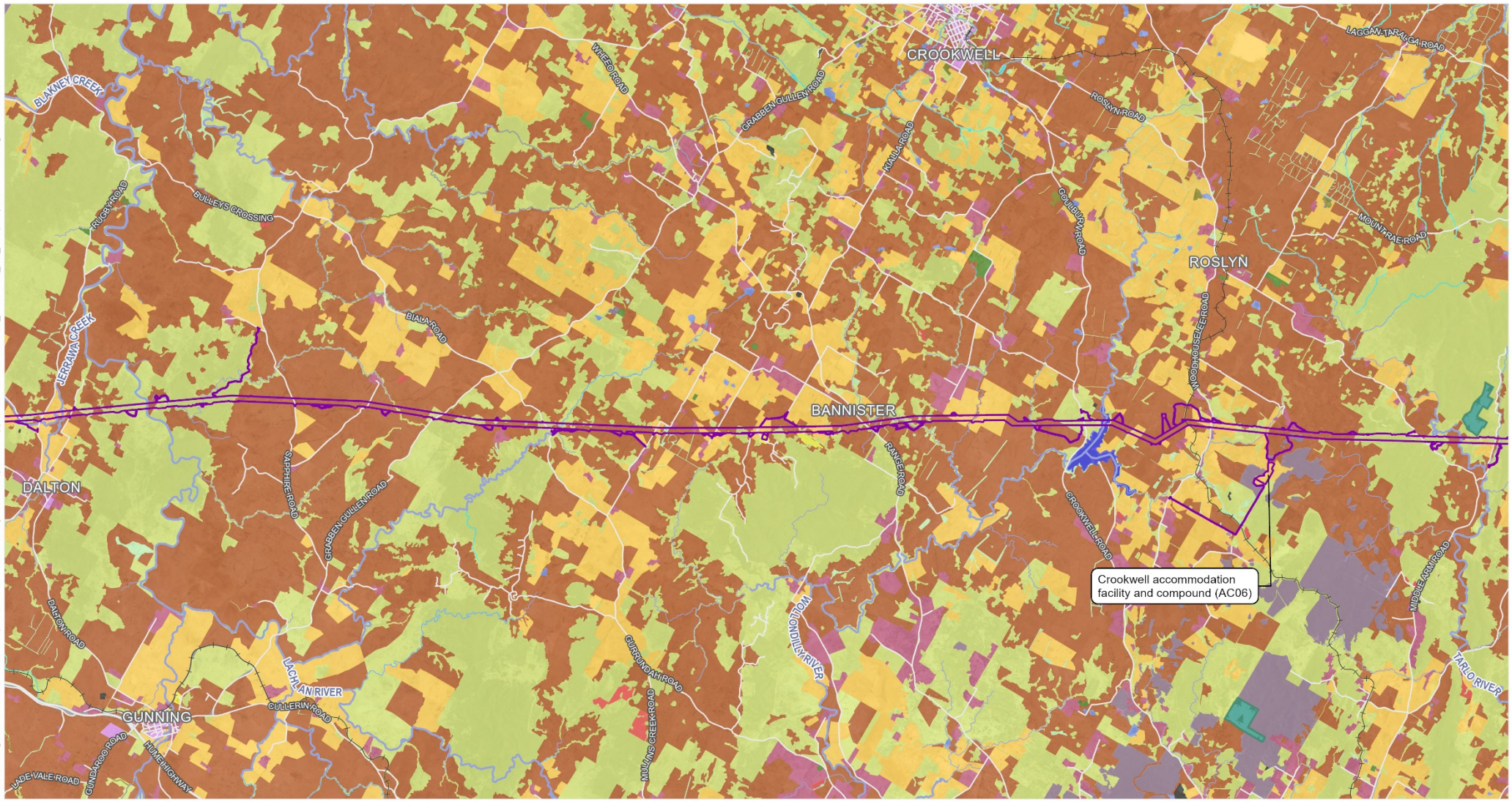
Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-4h: Land uses within and surrounding the amended project footprint



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Source: *Aurecon, Transgrid, DPE, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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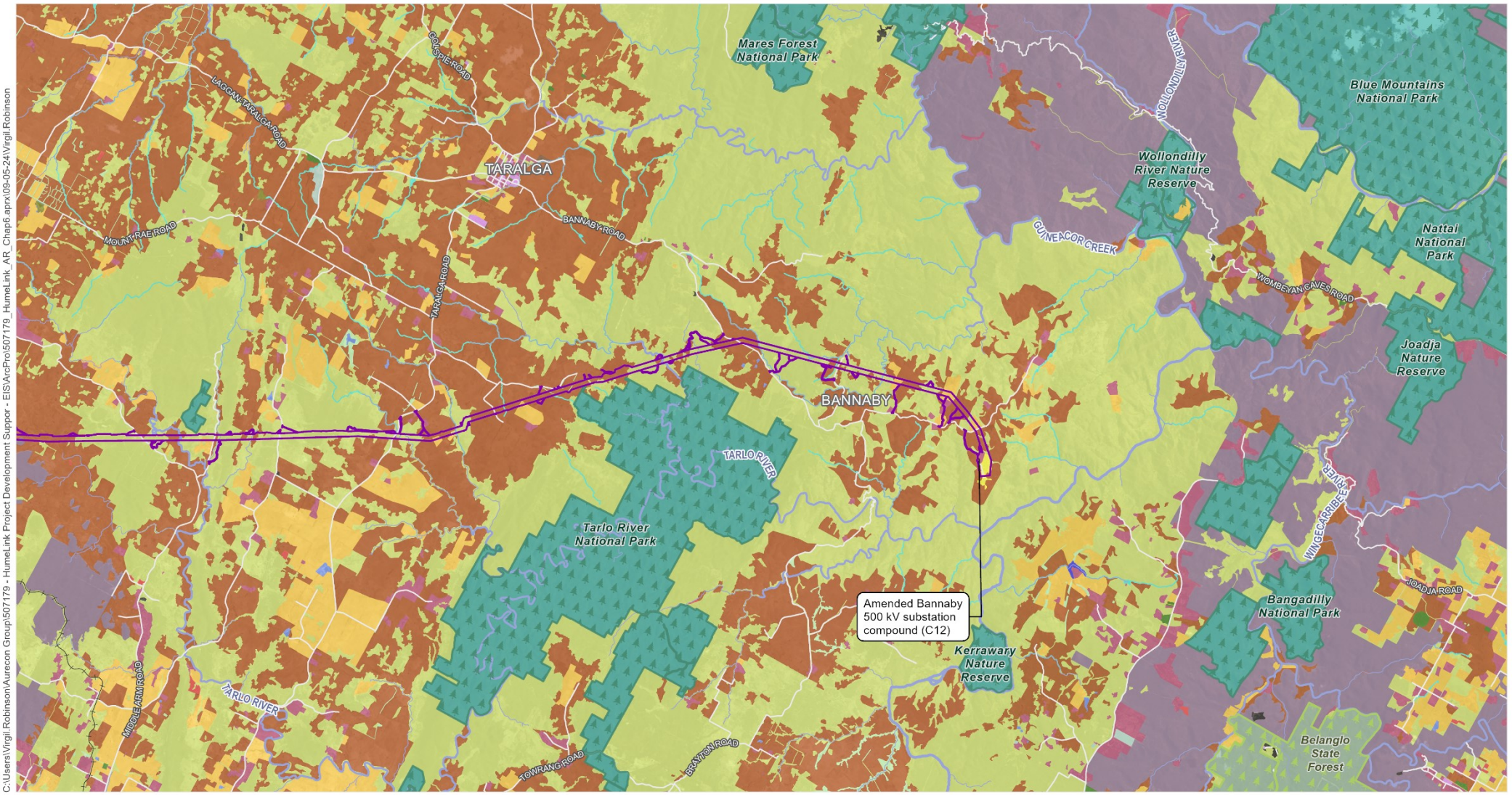
FIGURE 6-4i: Land uses within and surrounding the amended project footprint



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Source: *Aurecon, Transgrid, DPE, Spatial Services (DCS), ESRI Basemap*

1:150,000

0 3 6km

Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-4j: Land uses within and surrounding the amended project footprint

6.5.2. Assessment of amendments and refinements

6.5.2.1. Construction impacts – property

The amended project footprint spans a total area of 8,835 hectares, 284 hectares more than the EIS project footprint, which represents a 3.3 per cent increase in the land area intersected by the amended project.

The total area of the amended project footprint comprises 6,814 hectares of freehold land, about 412 hectares less than the EIS project footprint, reducing its share of the total area from 84.5 per cent to 77.1 per cent.

The amendment project footprint intersects 969 hectares of NSW Government land and 645 hectares of Crown land, which has increased by 461 hectares and 137 hectares, respectively, compared to the EIS project footprint. This is largely a result of the realignment of the transmission line corridor through Green Hills State Forest and the additional access tracks through Crown land.

As per the EIS, the amended project does not intersect any Commonwealth land.

Built environment

There are 11 dwellings, one of which is deemed uninhabitable, located within the amended project footprint, which is an increase of one dwelling compared to the EIS.

Two of the dwellings within the amended project footprint are likely to require demolition or relocation, which is an increase of one dwelling compared to the EIS project. Engagement with affected landowners has been ongoing for some time and these impacts are being addressed through the property negotiation process.

Overall, impacts on property and structures across the amended project footprint during construction are considered to be moderate as per the impact assessment rating in the EIS.

Access tracks

The amended project footprint requires about 650 hectares of land for access to the amended project, including about 609 hectares required for access tracks and about 41 hectares required for access track intersections with adjoining roads. Access tracks have largely been selected in consultation with landowners with the aim of utilising existing tracks where possible and providing mutually beneficial outcomes for the amended project and the individual landowner's land use needs.

New, amended or removed construction compounds and worker accommodation facilities

The five proposed combined worker accommodation facilities and construction compounds to support construction of the project would occur across around 105 hectares of land, which represents an increase of 94 hectares compared to the EIS project.

The amended project footprint proposes 11 standalone construction compounds to support the construction phase. The area required for amended construction compounds range in size from around two hectares to over 30 hectares. The overall land would be temporarily required during construction for construction compounds within the amended project footprint is around 238 hectares. As construction compound requirements and layouts are still being refined through further detailed design it is likely that several compounds may require a smaller area than the amount of land that has been identified and assessed.

Transgrid proposes acquisition or lease arrangements for the following new or amended construction compounds and worker accommodation facilities which are not currently owned or leased by Transgrid:

- around 123 hectares of freehold land would be leased from private landowners for Gadara Road compound (C19), Ellerslie Road compound (C21), Tarcutta accommodation facility and compound (AC03), Adjungbilly accommodation facility and compound (AC04), Yass accommodation facility and compound (AC05), Crookwell accommodation facility and compound (AC06) and Green Hills accommodation facility and compound (AC07)
- around 38 hectares would be leased from State Government entities (FCNSW) for the Amended Honeysuckle Road compound (C07), Ardrossan Headquarters Road compound (C17) and Snubba Road compound (C18)
- around 103 hectares would be permanently acquired as a result of the proposed Gugaa 500 kV substation (refer to Section 6.5.2.3). Of this, around 32 hectares would be utilised for the amended Gregadoo Road compound (C06). This is a change from a lease to an acquisition and an increase of 15.6 hectares compared to the EIS project.

Seven construction compounds and the Tumbarumba accommodation facility have been removed from the amended project:

- 28.6 hectares of land is no longer required to be leased from Snowy Valleys Council due to the removal of the Snowy Mountains Highway compound (C02), Bowmans Lane compound (C15), and the Tumbarumba accommodation facility (AC1)
- 22.2 hectares of land is no longer required to be leased from private landowners due to the removal of the Snubba Road compound (C03), Adjungbilly Road compound (C09) and Woodhouselee Road compound (C11)
- 2.6 hectares of land is no longer required to be leased from FCNSW due to the removal of the Red Hill Road compound (C08)
- 2.6 hectares of crown land (managed by FCNSW) is no longer required to be leased due to the removal of Snubba Road compound (C16).

Overall, impacts to private landowner tenure and ownership arising from the construction of the amended project would be temporary in nature and landowners would be compensated through commercial leases or purchase agreements (as relevant), which would contribute to mitigating these impacts. Furthermore, land temporarily used for construction, and not required for permanent infrastructure, would be restored or rehabilitated in consultation with the affected landowners and returned as soon as practicable at the completion of construction.

Transmission line structures and other ancillary facilities

The amended transmission line corridor is about five kilometres longer than the EIS project and would require additional transmission line structures, larger construction benches, and additional brake and winch sites. About 438 hectares of land is anticipated to be needed for the construction of the transmission line structures, compared to 407 hectares identified in the EIS. Temporary arrangements would take place across land with various tenure and ownership arrangements and would be confirmed during further detailed design and construction planning, in consultation with the relevant landowner.

Telecommunications connections

The additional telecommunications connections would cover an area of approximately 15 hectares. About 0.04 hectares would no longer required for the telecommunications hut at Killimicat.

Native Title, Aboriginal Land Claims, and Indigenous Land Use Agreements

Native Title Act 1993 (Commonwealth)

To date, searches of the National Native Title Register and Register of Native Title Claims, administered by the National Native Title Tribunal, did not identify any Crown land within the amended project footprint as being the subject of a claim or determination under the *Native Title Act 1993* (Commonwealth). Transgrid has not received search results in respect of roads that form part of the amended project footprint. Based on the searches undertaken to date, Transgrid does not anticipate that any of the Crown land areas that form part of the roads would be subject to a claim or determination under the *Native Title Act 1993* (Commonwealth).

In respect of areas of Crown land over which there has been no determination of native title, Transgrid would follow relevant procedures under the *Land Acquisition (Just Terms Compensation) Act 1991* (NSW) and the *Native Title Act 1993* (Commonwealth) and having regard to applicable Indigenous Land Use Agreements (ILUA), to enable the grant of the necessary interest in Crown lands required for the project. Further, to the extent that any roads are found to be subject to a claim or determination under the *Native Title Act 1993* (Commonwealth), Transgrid would follow the relevant procedures under the *Land Acquisition (Just Terms Compensation) Act 1991* (NSW) and the *Native Title Act 1993* (Commonwealth).

Aboriginal Land Rights Ac6t 1983 (NSW)

Searches of the Register of Aboriginal Land Claims were undertaken to identify any Crown land areas within the amended project footprint subject to an Aboriginal Land Claim (ALC). To date, the following ALCs have been identified as applicable to Crown land parcels within the amended project, pursuant to the *Aboriginal Land Rights Act 1938* (NSW):

- ALC 37091
- ALC 37092
- ALC37016
- ALC 49377
- ALC 10969 (blanket ALC)
- ALC 38763
- ALC 39736
- ALC 39339
- ALC 38760
- ALC 39332
- ALC 15057
- ALC 37122
- ALC 54805
- ALC 37027
- ALC 37032
- ALC 9444.

Separately, Transgrid has not received search results in respect of the roads that form part of the amended project footprint. To the extent that any undetermined land claims remain, Transgrid will work will the relevant Local Aboriginal Land Council and NSW Aboriginal Land Council to reach an agreement to the extent that the project affects the claim.

Indigenous Land Use Agreements

The amended project footprint does not intersect any new ILUAs compared to two identified in Chapter 11 (Land use and property) of the EIS.

6.5.2.2. Construction impacts - land use

Agricultural and primary production is the largest primary land use class in the land use and property study area and the amended project footprint. It comprises about 77.8 per cent of the land use and property study area and 96.8 per cent of the project footprint.

Table 6-16 provides a summary of potential land use impacts on each land use category arising from amended project during construction and their associated impact rating. Overall the impact rating for each land use category remained the same as the impact rating in the EIS, with the exception of forestry where the project impact rating has increased from moderate to moderate-major.

Table 6-16 Land use impacts during construction

Land use	Description	Amended project impact assessment ratings
Agriculture and primary production – Agricultural land	Agricultural land use About 6,821 ha (or around 77% of the amended project footprint) is mapped as agricultural land. This constitutes 0.3% of the total agriculture and primary production land within the land use and property study area). This represents about 360 ha less than the amount of agricultural land intersected by the EIS project footprint, or a reduction of 0.03% of the agricultural land use within the land use and property study area. Grazing areas intersected by the amended project footprint is about 5,884 ha (which is about 488 ha less compared with EIS project footprint). Cropping land intersected by the amended project footprint is about 921 ha (which is about 119 ha more than EIS project footprint). Approximately 147 ha of agricultural land would be temporarily required for the construction compounds and the combined worker accommodation facilities and construction compounds comprising approximately: • 31 ha of grazing land at Adjungbilly accommodation facility and compound (AC04) • 1 ha of grazing land at amended Bannaby 500 kV substation compound (C12) • 22 ha of cropping land at Crookwell accommodation facility and compound (AC06) • 10 ha at Ellerslie Road compound (C21) (about half is grazing land and half is cropping land) • 5 ha of grazing land at Gadara Road compound (C19) • 14 ha of grazing land at Tarcutta accommodation facility and compound (AC03) • 23 ha at Green Hills accommodation facility and compound (AC07) (including both irrigated perennial horticulture land and grazing land) • 11 ha of grazing land at Yass accommodation facility and compound (AC05) • 30 ha cropping land at Amended Gregadoo Road compound (C06). The actual area required for construction compounds and worker accommodation facilities may be less than that presented in the amended project footprint, however this is subject to further construction planning. Impacts to agricultural land uses arising from the construction of the amended project are temporary and assessed as being minor (consistent with the EIS).	Minor

Land use	Description	Amended project impact assessment ratings
	Agricultural productivity Based on the preliminary detailed design and construction methodology, the area of agricultural land that is likely to be used during construction is estimated to be 2,623 ha (approximately 0.2% of the total area of agricultural holdings in the land use and property study area). Agricultural land use across the transmission line corridor (about 1,617.8 ha) would largely continue during construction, as grazing and cropping would be possible during the majority of the construction period apart from during construction of the transmission line structures. Therefore about 1,005 ha of agricultural land would be unavailable during construction. Construction activities are not expected to substantially restrict movements of agricultural landowners, workers, their livestock, or equipment within the agricultural study area. It is possible that some movement would be affected temporarily due to restricted access to sections of the project footprint, eg during construction of transmission line structures or stringing activities. However, these restrictions would be relatively short term and, limited in area. Land use restrictions would be carried out in consultation with landowners and the relevant agreements in the property management plans. Therefore, any restrictions are unlikely to markedly affect movements for agricultural purposes. Noise and movement produced by proposed helicopter use, drone use and controlled blasting activities could impact livestock in specific circumstances, especially during calving and lambing periods. Any potential impacts on livestock would be appropriately managed through the implementation of the updated environmental management measures provided in Appendix B. Overall the direct impact of the amended project on agricultural production would be relatively low during construction and would have a minor effect on agricultural productivity in the context of the total area of agricultural holdings in the land use and property study area. Further detail on the value of agricultural production is provided in *Technical Report 4 – Agricultural Impact Assessment Addendum.* Travelling stock reserves (TSR) The amended project footprint intersects 21 ha of TSR land across eight TSRs. This is a reduction of 2.6 ha of TSR land compared to the EIS project footprint, however four additional TSRs have potential to be affected temporarily by restricted access to construction areas, compared to the EIS. Any access restrictions during construction within TSRs would be temporary and the impact on livestock movements and use of TSRs arising from construction of the amended project is considered negligible (consistent with the EIS). Land and soil capability The general land and soil capability descriptions included in the EIS would remain unchanged for the amended agricultural study area (as defined in *Technical Report 4 – Agricultural Impact Assessment Addendum)*. The amended project footprint and amended agricultural study area would have a larger proportion of class 6 land (low capability land) than the EIS project footprint and EIS agricultural study area (about 4 to 8% higher). This is mainly associated with the Green Hills corridor amendment where there is a high proportion of class 6 land. The area of biophysical strategic agricultural land (BSAL) within the amended project footprint is 509 ha (equivalent to about 5.8% of the amended project footprint and an increase of 62 ha compared to EIS). The area of draft State significant agricultural land (SSAL) within the amended project footprint is 631 ha (equivalent to about 7.1% of the amended project footprint and an increase of 97 ha compared to the EIS), which is 24% higher than the amount of BSAL. The increases are mostly due to the additional access tracks required for the amended project including existing tracks/roads which currently provide property access, but support little or no grazing or cropping activities.	

Land use	Description	Amended project impact assessment ratings
	The impact on BSAL and SSAL would be minor due to the relatively small area involved and because agricultural production would only be temporarily lost on most of this area during construction and for a limited time afterwards. Areas not required for operational purposes would be rehabilitated (if required) and returned to their former land uses (or as agreed with landowners) after construction has been completed. <u>Biosecurity risks</u> No change in impacts compared to the assessment in Chapter 11 (Land use and property) of the EIS.	
Agriculture and primary production – Forestry	The amended project footprint intersects approximately 1,728 ha (or around 20% of the amended project footprint) of land classified as forestry land uses. This constitutes 0.08% of the total agriculture and primary production land within the land use and property study area. Forestry land intersected by the amended project footprint is around 639 ha more than that intersected by the EIS project footprint. This comprises: • about 1,701 ha of production native forestry land (an increase of about 634 ha compared to the EIS project footprint) • about 27 ha of plantation forest land (an increase of 5.9 ha compared to the EIS project footprint). The amended project no longer requires the construction or use of the Adjungbilly Road compound (C09), Snubba Road compound (C16), Snubba Road compound (C03) and Red Hill Road compound (C08) which were located on forestry land. <u>Production native forestry</u> Notably the Green Hills corridor amendment, has resulted in an overall increase in the amount of forestry land within the amended project footprint. The Green Hills corridor amendment was initially proposed by the community and adopted in consultation with FCNSW to minimise impacts on forestry land uses. About 1,650 ha of production native forestry land intersected by the amended project footprint is attributable to the Green Hills corridor amendment and additional access tracks. The remaining 50 ha of production native forestry is attributable to revised or new construction compounds (compared to about 25 ha for the EIS), including: • Amended Honeysuckle Road compound (C07) intersecting about 15 ha of Red Hill State Forest • Maragle 500 kV substation compound (C05) intersecting about 12 ha of Bago State Forest. Most of the compound would be cleared as part of the Snowy 2.0 Transmission Connection project before work for this project commences • Ardrossan Headquarters Road compound (C17) intersecting about 7 ha of Green Hills State Forest, which does not contain forested areas, however, does include existing buildings and structures likely used to support forestry operations • Snubba Road compound (C18), intersecting about 16 ha of Bago State Forest. Some of the forestry land identified for use as construction compounds are either cleared or do not currently host forestry resources, the selection of these sites over other potential construction compounds with forestry cover, reduces the potential forestry land use impact. Despite the increase in area, however, the amount of forestry land intersected by the amended project footprint still represents only around 0.7% of the forestry land use across the land use and property study area. <u>Plantation forests</u> The amended project footprint intersects about 27 ha of land identified as being used for plantation.	Moderate-major

Land use	Description	Amended project impact assessment ratings
	The Adjungbilly Road compound (C09) was associated with around 12.1 ha of plantation forest, which was observed to be significantly forested, which is now no longer required for the amended project. The amended Adjungbilly Road accommodation facility and compound (AC04) intersects land mapped as plantation forestry land (around 0.1 ha). However, based on satellite imagery, this area appears to be a largely cleared existing access track. Other relatively small areas of plantation forest are intersected by the amended project including: • near Oberne Creek and Ellerslie • near Gocup and Killimicat • near Adjungbilly and Gobarralong. Overall, considering the increase of forestry land impacted by the amended project footprint (in area and proportion of the land use and property study area defined in the EIS), temporary impacts to forestry land uses resulting from the construction of the amended project have increased from moderate as assessed in the EIS to moderate-major for the amended project. Transgrid is currently negotiating with FCNSW regarding compensation for the loss of forestry land due to the amended project. Transgrid would compensate forestry operators for any lost plantation forestry land in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991* and/or through the provision of replacement land. This approach would help reduce the impacts on forestry land.	
Infrastructure and utilities	The amended project footprint intersects approximately 77 ha of infrastructure and utility land uses, accounting for approximately 0.6% of the total for these land uses across the land use and property study area. This represents an increase of about 5 ha compared to the EIS project footprint. A large portion of this impact is a result of intersecting with existing Transgrid assets including the Amended Bannaby 500 kV substation compound (C12), Wagga 330 kV substation compound (C01) and Yass substation compound (C10). Around 3 ha of additional utilities land use compared to the EIS project footprint is due to the amended project footprint's intersection with components of the Gullen Range Wind Farm, near Bannister, where a proposed access track intersects the solar farm area. The amended project footprint no longer intersects about 5.7 ha of waste treatment and disposal land use as a result of the removal of Bowmans Lane compound (C15) from the amended project. Similarly, around 16 ha of transport and communication land use area is intersected by the amended project footprint, an increase of about 8 ha compared to the EIS project footprint. Much of these additional areas of intersection of transport and communication land use areas in the amended project footprint arise due to the additional detail available in relation to road intersections and access tracks. The amended project footprint also intersects two APA Group gas pipelines associated with the Moomba to Sydney Pipeline System at Gadara Road, Gadara and at Dalton near Felled Timber Road. In addition, the amended project footprint intersects a Jemena gas pipeline at Cooks Hill Road, Bango. Whilst the transmission line crosses gas pipelines and other utilities, the transmission line structures could be micro-sited to avoid impacts to the utilities. Refer to Section 6.13.2.4 for further discussion. To minimise impacts to infrastructure and utilities, an updated mitigation measure LP9 is proposed to ensure the location of all services and utilities within the construction area are confirmed during detailed design, and any required protection or relocation are designed in consultation with utility providers. Impacts to infrastructure and utility land uses arising from the construction of the amended project are temporary and assessed as being negligible (consistent with the EIS).	Negligible

Land use	Description	Amended project impact assessment ratings
Urban-Residential and farm infrastructure	Only a small amount of the amended project footprint (around 33 ha) consists of urban land uses. This represents an increase of around 14 ha compared to the EIS project footprint. This equates to about 0.4% of the amended project footprint, and around about 0.05% of the total residential and farm infrastructure land use area in the land use and property study area. Most of this area is residential and farm infrastructure land use area (about 27 ha).The increase in intersected residential and farm infrastructure land use area is due in part to the nomination of additional access tracks. This has resulted in numerous intersections of small areas of residential and farm infrastructure land use. In addition, two compounds impact this land use, including: • about 3.8 ha for amended Bannaby 500 kV substation compound (C12) • about 2.2 ha for Green Hills accommodation facility and compound (AC07). Construction of the amended project would require some adjustments to land used for residential and farm infrastructure. This would mainly accommodate access tracks or the transmission line easement. A number of these properties already contain existing transmission line structures and the land use is maintained. Overall, construction impacts on residential and farm infrastructure land uses are assessed to be minor (consistent with the EIS).	Minor
Urban-Manufacturing and industrial	The amended project footprint intersects about 1.5 ha of manufacturing and industrial land use area, at the Visy Pulp and Paper Plant in Gadara, west of Tumut, and at the Yass accommodation facility and compound (AC05). This is an increase of 1.4 ha compared to the EIS. Works occurring within the manufacturing and industrial land use area associated with the Visy Pulp and Paper Plant could result in temporary or intermittent impacts to the operator during construction. These would be managed through consultation with the landowner, operator and/or the relevant authority. Interruptions would be short-term and scheduled to minimise any potential impacts. The Yass accommodation facility and compound (AC05) intersects a small amount of manufacturing and industrial land use area and a gravel hardstand area that appears to be in use for material sorting and vehicle storage. The small bulk grain storage area intersected by the EIS project footprint (0.14ha) at Woodhouselee is no longer intersected by the amended project footprint. The construction of the amended project is unlikely to impact the manufacturing and industrial land use at the affected areas, and any impacts would occur over a small area. The impact to manufacturing and industrial land uses arising from construction would therefore be negligible (consistent with the EIS).	Negligible
Urban – Services	The amended project footprint is largely unchanged compared to the EIS project footprint in relation to impacts to services land uses, which remain negligible.	Negligible
Natural environment	Consistent with the EIS, the amended project footprint avoids areas of nature conservation land uses (eg National Parks). The amended project intersects about 40 ha of natural environmental land use including 32 ha of managed resource protection land (including riparian areas and landscaped areas) and 7.7 ha of other minimal use land (residual native vegetation). These areas of intersection represent a small increase compared to the EIS project footprint (6.8 ha), generally as a result of the inclusion of additional area within the amended project footprint for access tracks and intersections. However, the difference is negligible (0.2%) in proportional terms across the natural environment land uses within the land use and property study area.	Minor

Land use	Description	Amended project impact assessment ratings
	Vegetation within managed resource protection areas may need to be cleared to construct physical structures and access tracks, and to establish appropriate clearances from the transmission line structures. Only minimal quantities of natural environment land are associated with construction compounds or combined worker accommodation facilities and construction compounds, including: • about 0.1 ha of managed resource protection (a tree windbreak) at the Amended Gregadoo Road compound (C06) • about 0.04 ha of other minimal use land (residual native vegetation) at the Crookwell accommodation facility and compound (AC06). Where natural environment land is not required to be permanently cleared, it would be rehabilitated and reinstated (as agreed with the landowner) upon completion of construction. Overall, potential impacts on natural environment land use impacts from construction of the amended project remain minor (consistent with the EIS) in the broader context of the land use and property study area. <u>National Parks</u> The amended project footprint is located close (within one km) to a number of national parks, nature reserves, and state conservation areas including: • Minjary National Park – adjacent to the west of the amended project footprint • Mudjarn Nature Reserve – about 623 m north of the amended project footprint • Bango Nature Reserve – about 140 m north of amended project footprint • Back Arm Nature Reserve – about 75 m north of the amended project footprint • Tarlo River National Park – about 11 m south of the amended project footprint • Kosciuszko National Park – about 73 m east of the amended project footprint. The main construction activity to be carried out adjacent to national parks and nature reserves would be associated with construction of the transmission line structures and clearing within the transmission line easement. Table 11-8 within Chapter 11 (Land use and property) of the EIS outlines the potential indirect impacts in accordance with *Developments adjacent to National Parks and Wildlife Service lands: Guidelines for consent and planning authorities* (NPWS, 2020). Overall, potential indirect impacts on adjacent national parks and nature reserves are expected to be minimal (consistent with the EIS) and managed in accordance with mitigation measures proposed for the project.	
Extractive industries	Only a small area of land classified as extractive industries land use is intersected by the amended project footprint, totalling just 3.7 ha (a minor increase of 0.1 ha compared with the EIS). The amended project footprint intersects land and access roads associated with the Gregadoo Waste Management Centre, however, as noted in *Technical Report 5 – Land Use and Property Impact Assessment* prepared for the EIS, this area is incorrectly identified in the land use dataset as a mining land use area. Other mining land use areas intersected by the amended project footprint are two small areas of less than 1 ha, both associated with land that appears to be in use as local quarries, one located east of Batlow Road and Wondalga Road, south-west of Tumut, and one directly west of Pejar Dam. An updated review of mining licences intersected by the amended project footprint was undertaken in November 2023. As with the EIS project footprint, the amended project footprint does not intersect mining leases. The amended project footprint intersects a total of 20 mining exploration licences, four more than the EIS project footprint. Additional exploration licences (all for minerals) intersected by the amended project footprint are shown below: • EL8939, Trk Resources Pty Ltd, Expiry 04/02/2027	Negligible

Land use	Description	Amended project impact assessment ratings
	• EL9556, Jamieson Minerals Pty Ltd, Expiry 20/04/2025 • EL9589, Legacy Minerals Pty Ltd, Expiry 28/07/2029 • EL9593, ABX2 Pty Ltd, Expiry 09/08/2026 Though it is possible these activities may occur in part of an exploration licence area that would be intersected by the amended project, it is likely that the activities would be able to proceed alongside the amended project during construction, or in an adjacent part of the exploration licence area. As such, a minor temporary impact may be realised should a proponent wish to undertake mining exploration activities within the amended project footprint during the construction period. The impact assessment in relation to impacts to extractive industries land uses or mining titles is unchanged compared to the EIS, and remains negligible.	
Water	The amended project footprint intersects a total of around 133 ha of water land uses, typically associated with crossings over lakes, rivers, and creeks, and areas classified as marshes or wetlands (around 21 ha less compared to the EIS project footprint). This reduction is largely achieved through the reduced amended project footprint area at Wondalga south-west of Tumut. The impact assessment in relation to water land uses is unchanged compared to the EIS, and remains negligible.	Negligible

Note: For the purposes of this assessment and calculations it has been assumed that the Crookwell accommodation facility and compound (AC06) is agricultural land (cropping). The Crookwell accommodation facility and compound (AC06) would occupy land which has been previously disturbed, and currently used as a construction compound, as part of the construction of the Crookwell 3 Wind Farm (SSD-6695).

6.5.2.3. Operational impacts - property

The indicative total area of land affected by operation of the amended project is 3,175.9 hectares which has increased by 586 hectares compared to the EIS project. These changes are related to:

- the additional area required for transmission line easements, which has increased in length by five kilometres to 365 kilometres and in width in some areas
- an increased area of nominated access tracks (which has conservatively been assessed as having potential to be retained during operation, refer to Section 3.4.2.2).

Thirty-four hectares of land required for the proposed Gugaa 500 kV substation would be required during operation (an increase of around 12 hectares compared to the EIS), along with about 37 hectares of land for transmission line structures (increase of about one hectare compared to EIS).

Freehold land (0.04 hectares) associated with the proposed telecommunications hut located at Killimicat would no longer be required for the amended project.

Tenure and ownership adjustments

The amended project would require permanent alterations to property tenure or ownership arrangements to facilitate operation, as outlined in Chapter 11 (Land use and property) of the EIS.

Whilst only around 34 hectares of freehold land would be required for the operational phase of the proposed Gugaa 500 kV substation, the amended project includes the purchase of additional freehold land in this location. Acquisition required for the amended project would lead to some of the landowner's holdings in the local area becoming isolated, impacting their ability to use their land efficiently. To mitigate this issue, Transgrid would acquire a larger parcel of land from the landowner, bringing the total acquisition

to around 103 hectares. This has been proposed both as a result of design changes required to enable the efficient undertaking of future works for the Victoria to NSW Interconnector West (VNI West) project and to minimise the impacts of acquisition on the relevant landowner.

As such, the operational impact on tenure and ownership would remain moderate as per the impact rating in the EIS.

Other property impacts

As indicated in Section 6.5.2.1, the amended project includes additional telecommunications connections between the transmission line and existing substations which require a two-metre-wide easement for underground fibre optic cables between the transmission line and three existing Transgrid substations (refer to Chapter 3 (Description of the amended project)).

The final telecommunications connections alignments and their easements would be subject to negotiations with the relevant landowners, however, operational property impacts are anticipated to be negligible as they would be largely underground.

Other operational property impacts, such as built environment alterations, movement restrictions and land value remain unchanged compared with Chapter 11 (Land use and property) of the EIS.

6.5.2.4. Operational impacts - land use

Table 6-17 provides a summary of potential land use impacts on each land use category arising from project amendments and refinements during operation and their associated impact rating. Overall the impact rating for each land use category remained the same as the impact rating in the EIS with the exception of forestry where the project impact rating has increased from moderate to moderate-major.

Table 6-17 Land use impacts during operation

Land use	Description	Amended project impact assessment ratings
Agriculture and primary production – Agricultural land	The total area of agricultural land affected during operation is approximately 2,477 ha. Of this, 1,884 ha would consist of the transmission line easement. While the easement would be subject to some restrictions as outlined within Transgrid's *Living and working with electricity transmission lines* guideline, some agricultural activities (such as grazing) could continue in the easement during operation. Therefore, the area of agricultural land use unavailable during operation is estimated at 593 ha. This is equivalent to 0.04% of the total area of agricultural holdings in the land use and property study area. The total area of agricultural land affected by the operation of the amended project would represent an increase of 306 ha compared to the EIS project. Most of this change is related to the transmission line easement and changes to the assessed area of access tracks to be retained (following a conservative assumption that all access tracks utilised for construction would be retained for operation). Access tracks would be dispersed throughout the amended project footprint and would only impact a small amount of land use in any one location, however, cumulatively, these represent a large area, particularly relating to agricultural land uses. Whilst new or improved access tracks may provide some benefit to landowners or support agricultural land uses, land required for permanent access would no longer be able to be used for agricultural purposes. Operation of the proposed Gugaa 500 kV substation would result in the permanent loss of up to approximately 34 ha of cropping land use area, which would change to utilities land use.	Minor

Land use	Description	Amended project impact assessment ratings
	Agricultural productivity Impacts on agricultural productivity remain largely as outlined within Chapter 11 (Land use and property) of the EIS. Overall, the impact of the amended project on agricultural production would remain minimal during operation due to the small area affected relative to the total size of agricultural enterprises within the surrounding LGAs. Travelling stock reserves Impacts on TSR remain negligible as outlined within Chapter 11 (Land use and property) of the EIS. Land and soil capability The area of BSAL within the amended project footprint would be 509 ha, equivalent to 5.8% of the amended project footprint. This is an increase of 14% compared to the EIS project. The increase mostly arises from the larger area of access tracks required for the amended project. However, this would be considered an overestimate as some of the access tracks would be temporary and returned to agricultural use as agreed to with landowners. The impact on BSAL would be minor due to the small area involved. Most of the area would be restored or rehabilitated (if required) and returned to its former land use during operation. The area of draft SSAL within the amended project footprint would be 631 ha, an increase of 18% compared to the EIS project. This is equivalent to 7.1% of the amended project footprint and is 24% higher than the amount of BSAL. The increase mostly arises from the larger area of access tracks. As for BSAL, the impact on SSAL would be minor due to the small area involved and the restoration or rehabilitation of most of the area. Biosecurity risks No change in impacts compared to the assessment in Chapter 11 (Land use and property) of the EIS. Consistent with the EIS project, permanent agriculture impacts from the operation of the amended project are considered to be minor.	
Agriculture and primary production – Forestry	Based on the current design, it is estimated that the amended project would result in up to about 615 ha[1] of forestry land use being cleared, the vast majority of which would be production native forestry (600 ha) and the remainder plantation forest (14 ha). This is an increase of about 252 ha of production native forestry land and about 11 ha of plantation forestry land compared to the EIS project footprint. This increase is largely due to the Green Hills corridor amendment. Despite the increase in area, however, the amount of forestry land required to be cleared still represents only around 0.33% of the forestry land use across the land use and property study area. In addition to direct impacts associated with land clearing, restrictions on operating within and near easements may further reduce or alter access arrangement for forestry equipment on a permanent basis. It should be noted that a large area of these plantations has been previously impacted by bushfires and is currently clear of trees or consists of replanting in more recent years. Transgrid is negotiating to compensate forestry operators for any lost plantation forestry land. Any compensation or arrangements for land replacement is being considered in consultation with FCNSW. This would offset permanent impacts, though would potentially have flow-on land use impacts associated with transferring land currently used for other purposes to forestry land uses. Permanent impacts to forestry land uses arising from the operation of the amended project are considered to be moderate-major, an increase compared to the EIS for which the operational impact on forestry land uses was rated as moderate.	Moderate-major

Land use	Description	Amended project impact assessment ratings
Infrastructure and utilities	Based on the preliminary detailed design, the operation of the proposed Gugaa 500 kV substation would result in a permanent addition of approximately 34 ha of utilities land use from former agricultural land. Where the transmission line crosses gas pipelines and other utilities, impacts may potentially occur during maintenance activities, but due to likely avoidance through micro-siting during construction, any operational impacts would be considered negligible. The impact assessment in relation to impacts on infrastructure and utilities land uses is unchanged compared to the EIS, and remains negligible.	Negligible
Urban, Extractive industries, Water	The impact assessments in relation to impacts on urban, extractive industries and water land uses are unchanged from the EIS, and remain negligible.	Negligible
Natural environment	Due to the small amount of area affected, the impact assessment in relation to permanent impacts to natural environment land uses arising from the operation of the amended project is unchanged compared to the EIS, and remains minor.	Minor

Note: For this assessment and calculation of operational forestry land use area, it has been assumed that all vegetation within transmission line easements and disturbance areas subject to permanent access tracks would be cleared.

6.5.3. Updated mitigation measures

The approach to management and avoidance/ minimisation of land use and property impacts remains largely consistent with the approach provided in Chapter 11 (Land use and property) of the EIS. The mitigation measures identified for the EIS project remain applicable to the amended project. Additional measures have been identified as a result of submission raised to mitigate indirect land use and property impacts including:

- stringing transmission lines across Pejar Dam
- landowners' ability to utilise aerial farming operations
- impacts to utilities and services.

Minor updates for clarity have also been made to LP2 and LP4. The updates are shown in **green** and ~~**strikethrough**~~ in Table 6-18. The consolidated list of mitigation measures for the amended project is provided in Appendix B (Updated mitigation measures).

Table 6-18 Summary of revised and new land use and property mitigation measures

Reference	Impact	Mitigation measures	Timing	Relevant location
LP2	Property impacts	A property management plan will be developed for directly impacted properties in consultation with landowners and stakeholders. The property management plans will outline the protocols that will be implemented to address landowner concerns during construction. This may include: • the process for rectification of any damage to property infrastructure caused by construction • the process for **restoration or** rehabilitation and stabilisation of disturbed areas following the completion of construction • measures to minimise disruption to agricultural practices during construction • any fencing and gate requirements • specific biosecurity protocols.	Detailed design and construction	All locations
LP4	Biosecurity	Biosecurity controls will be implemented to minimise the risk of off-site transport or spread of disease, pests or weeds. Controls will be in accordance with **a Biosecurity Management Plan developed as part of the Biodiversity Management Plan to be implemented during construction, and** Transgrid's *Biosecurity Procedure and Biosecurity Environmental Guidance Note* **to be implemented during operation,** and **will** include development of specific controls if high biosecurity risks are identified. Appropriate measures will be implemented with respect to foot and mouth disease to control any risk of introduction via the project. The specific controls applicable to a property will be identified in consultation with the affected landowner. The effectiveness of these controls will be monitored in a manner and time interval consistent with the level of risk on each property. In the event of new infestations of notifiable weeds as a result of construction activities, the relevant control authority will be notified as per *Biosecurity Act 2015* (NSW) and Biosecurity Regulation 2017.	Construction and operation	All locations
LP7	**Stringing transmission line across Pejar Dam**	**Should boats be used to string transmission lines across Pejar Dam, they will be:** • **operated in a manner that minimises wash and bank erosion** • **appropriately maintained, and include spill containment kits** • **clean and free of visible debris and biological material before entering the water.** **Should drones or helicopters be used to string transmission lines across Pejar Dam, consultation will be undertaken with Goulburn Mulwaree Council to determine if further mitigation measures are required.**	**Detailed design and construction**	**Pejar Dam**
LP8	**Consultation regarding aerial farming**	**Consultation will be undertaken with relevant landowners who utilise aerial farming operations to identify appropriate mitigation arrangements (where feasible) such as the installation of aerial warning markers on the transmission lines.**	**Construction and operation**	**Transmission line**

Reference	Impact	Mitigation measures	Timing	Relevant location
LP9	Impacts to utilities and services	The location of all services and utilities within the construction area will be confirmed during detailed design, and any required protection or relocation will be designed in consultation with utility providers.	Detailed design	All locations

6.6. Economic

6.6.1. Approach to assessment

An updated economic assessment has been prepared to assess the potential economic impacts of the amended project, which have changed as a result of the proposed amendments and refinements to the project. The assessment also includes the agricultural productivity impacts from *Technical Report 4 – Agricultural Impact Assessment Addendum.*

There has been no change to the legislative and policy context presented in *Technical Report 6 – Economic Impact Assessment* prepared for the EIS. There has been no change to the economic study area compared to the EIS as this sufficiently covers the around surrounding the amended project footprint.

The assessment has been prepared generally in accordance with the methodology outlined in *Technical Report 6 – Economic Impact Assessment* prepared for the EIS. However, the updated assessment uses more recent data from the Australian National Accounts 2020-21 Input-Output (I-O) tables (ABS, 2023), replacing the Australian National Accounts 2019-20 I-O tables (ABS, 2022) that were previously used in *Technical Report 6 – Economic Impact Assessment* prepared for the EIS.

6.6.2. Assessment of amendments and refinements

6.6.2.1. Construction impacts

Impacts from construction expenditure and employment on economic activity

Transgrid estimate the indicative capital investment value (CIV) for the amended project at $4.507 billion, noting this figure excludes project costs subject to separate planning approvals, financing costs, land acquisition costs and Goods and Services Tax. The assessment of economic impacts is based on a more conservative use of the indicative design and construction cost of $4.09 billion in 2023 dollars for the amended project only. Both the CIV and design and construction costs were determined during the development of the stage 2 contingent project application to the Australian Energy Regulator. The $4.09 billion figure marks an increase of $823 million from the $3.27 billion figure stated in the EIS. The overall cost estimate of HumeLink has increased to $4.88 billion (June 2023 dollars, excluding equity raising costs). These cost increases are driven by global demand, supply chain disruption and increased prices for raw materials and are commensurate with increases in major projects globally during this period.

Chapter 12 (Economic) of the EIS outlines the two types of multiplier effects (production induced and consumption induced multiplier effects) that result in the level of additional economic activity generated by a source industry (eg the construction industry). Taking into account the multipliers adopted, the forecasted increase in total gross output as a result of the amended project is $12.1 billion at a national level, $11.3 billion at the State level and $8.5 billion at the regional economy level. This reflects an increase compared to the EIS project in total gross output of $2.7 billion at the national level, $2.4 billion at the State level, and $2.1 million at the regional level. This increase represents a conservative assessment, as the final CIV for the amended project is higher than the design and construction cost used in the economic impact assessment.

Design and construction of the amended project would directly contribute around $1.5 billion to the regional economy. Accounting for multiplier impacts, a total of $3.6 billion would be contributed to or supported in the regional economy. The gross value added (GVA) for the amended project is $5.4 billion at a national level and $5.1 billion at the State level. This represents an increase of $1.2 billion at the national level, $1

billion at the State level, and $0.8 billion at the regional level compared to the EIS project. This increase can be attributed to increased investment and, consequently, economic activity associated with the amended project.

Employment generated from construction

According to the Australian Bureau of Statistics (ABS), every million dollars of design and construction work undertaken generates 1.91 job years. A job year is one full-time equivalent job over one year. Based on the estimated design and construction costs, 7,790 job years would be directly generated nationally by the amended project.

With the application of multiplier effects, approximately 32,639 job years would be supported in the national economy from the construction of the amended project. This indicates an increase of 5,346 job years at the national level, 4,680 at the State level, and 4,651 at the regional level compared to the EIS project.

Worker remuneration

Based on ABS data, for every dollar spent on construction $0.21 goes to the construction workers in increased salaries (ABS, 2022). From the estimated capital cost, total workers' remuneration nationally would increase by $874 million directly because of the amended project. Including multipliers, the forecast increase in total salaries at a national level is $2.8 billion, $2.7 billion at State level and $1.9 billion in the regional economy. This represents an increase of $633 million at the national level, $569 million at the State level, and $465 million at the regional level compared to the EIS project.

Other economic impacts from construction of the amended project are discussed in Table 6-19.

Table 6-19 Economic impacts from construction of the amended project

Impact	Detail
Tourism	Impacts on tourist accommodation are likely to be reduced under the amended project due to the provision of new temporary worker accommodation facilities in Tarcutta, Lower Bago, Crookwell, Yass and Adjungbilly. The worker accommodation facility at Tumbarumba outlined in the EIS is no longer proposed. The majority of workers for construction of the amended project would be accommodated in the temporary worker accommodation facilities provided by Transgrid, thereby reducing the need for them to occupy short-term accommodation in nearby towns. The additional worker accommodation facilities proposed in the amended project compared to the EIS project could relieve potential pressures on existing tourist accommodation, indirectly mitigating any potential adverse effects on the tourism sector that may have otherwise occurred from construction workers causing a surge in competition for accommodation or temporary rate increases. Notwithstanding the proposed increase in temporary worker accommodation facilities for the amended project, there remains a need for some existing short-term accommodation in towns to be used to house a small number of construction workers, particularly during site establishment and decommissioning of the worker accommodation facilities. It is likely that existing accommodation near the amended project can provide the required capacity for construction workers while still retaining a substantial number of available rooms to cater for tourists in the region. These existing tourist accommodation facilities are expected to benefit from the increased revenue generated by construction workers staying at their facilities. Any adverse impacts on tourism resulting from the construction disturbances (eg traffic impacts, noise and visual impacts) is likely to be outweighed by the benefits of consumption induced impacts in the economic study area resulting from additional workers. This would benefit existing businesses in the economic study area including retail, accommodation and food services.

Impact	Detail
Temporary loss of existing land use	The amended project would require new temporary construction compounds and worker accommodation facilities to be established to support construction activities. These facilities would be located on private and public property and may prevent the use of the area for existing land uses (refer to Section 6.5.2.2 for further information on land use impacts). It is expected that potential impacts would be minimised through compensation provided via leases and landowner agreements. Land required for temporary facilities would be returned post-construction to a similar condition as previous, or as agreed with the landowner, and as such the associated economic impacts to the region from these temporary changes in land use are considered minimal and temporary.
Temporary impacts on agricultural productivity	The economic impacts of the project on existing agricultural enterprises at the regional level would be minimal. Based on the area of agricultural land that is expected to be unavailable during construction (refer to *Technical Report 4 – Agricultural Impact Assessment Addendum),* $593,009 per annum of agricultural production is estimated to be lost during the construction period. Allowing for an average 2.5-year period of disruption across all work sites, the total loss of agricultural production for the amended project during construction is estimated at approximately $1,482,523, compared to $837,800 in the EIS. The amended value of agricultural production loss is based on a complete loss of potential agricultural production on affected areas during construction. But since 'existing' and 'upgraded' tracks have a pre-existing impact on agricultural production, the loss in these areas would be less than the full potential agricultural production. Therefore, the amended value of agricultural production loss is considered highly conservative and likely overestimates the impact of the amended project. Most of the impacts would be temporary, and permanent impacts would be relatively small compared to the value of regional agricultural production. The agricultural production loss is estimated to: • reduce total GVA by around $206,949 per annum assuming a GVA per worker of $98,500 (as per EIS) – equivalent to around $517,373 during construction, indicating a $224,996 greater loss compared to the EIS project • reduce total worker remuneration by around $45,655 per annum, assuming an average salary of $21,730 (as per EIS) – approximately $114,137 over two and half years, reflecting a $49,636 higher loss than the EIS project • result in the loss of 2.1 full-time equivalent jobs per annum based on an average output per worker of $282,250 per annum (as per EIS) – equivalent to 5.3 jobs over two and a half years, representing a loss of 2.3 more job years than the EIS project. The above estimated economic impacts of the amended project on existing agricultural enterprises at the regional level are considered minimal given that it represents a loss of only 0.02% of total gross output of agricultural businesses in the economic study area. Overall the direct temporary impact of the amended project on agricultural production would remain relatively low during construction and would have a minor effect on agricultural productivity in the context of the total area of agricultural holdings in the five impacted LGAs. Further detail is provided in *Technical Report 4 – Agricultural Impact Assessment Addendum.*
Impacts on State forests and private plantation	Five construction compounds associated with the construction of the amended project are located on land that is (in part or in full) classified as forestry land use. Of these, only the Maragle 500 kV substation compound (C05) is currently forested, however the majority of this area would be cleared as part of the Snowy 2.0 Transmission Connection project. The economic cost of clearing the 0.98 ha of forestry within the uncleared area of the Maragle 500 kV substation compound (C05) amounts to $1,274 per year over the two and a half years of construction. The impact of this construction compound on forestry would cease upon completion of construction, due to the restoration of the land to its original condition or as agreed with the landowner. However, there would be a minor level of lost productivity and associated costs for the operator due to costs and delays associated with replanting. The other construction compounds do not currently contain forestry resources.

6.6.2.2. Operational impacts

Reliable and affordable power

Since public exhibition of the EIS, the net market benefits associated with HumeLink have been recalculated by Transgrid to have increased from $491 million to more than $1 billion (Transgrid, 2024a). However, it is noted that this increase in net market benefits is primarily driven by the latest AEMO information on timing of energy generation projects, and emissions targets and renewable energy policies changing the inputs and assessments for AEMO benefits modelling rather than the amended project itself.

Impacts on the agricultural industry

The value of agricultural production loss for the amended project is assessed at $350,106 per annum, $200,106 per annum more than compared to the EIS project (further detail is provided in *Technical Report 4 – Agricultural Impact Assessment Addendum*). This translates to:

- a loss of 1.2 full-time equivalent jobs, compared to 0.7 full-time equivalent jobs in the EIS project
- total GVA reduced by an additional $69,833 per annum to a total of $122,180 per annum, based on a GVA per worker of $98,500 as per the EIS.

The value of agricultural production loss would overestimate the impact of the amended project due to the fact that the operational assessment of the transmission line structures has applied a worst case indicative footprint for each transmission line structure footing and has assumed that all access tracks will be retained for operation.

The above estimated economic impacts of the amended project on existing agricultural enterprises at the regional level are considered minimal, given that it represents a loss of only 0.01 per cent of total gross output of agricultural businesses in the economic study area.

Impacts on State forests and private plantation

For this assessment, it is assumed that vegetation within the transmission line easement would be cleared or kept at a limited height for safety and operational reasons, rendering forestry an unsuitable land use within the transmission line easements. The assessment also assumes the full extent is vegetated. It should be noted that large areas of plantation within the Green Hills corridor amendment have been previously impacted by bushfires and are either currently clear of trees or consist of replanting in more recent years.

Based on the indicative design, the amended project would result in up to 614.7 hectares of forestry land use areas being permanently cleared compared to about 351.8 hectares for the EIS project (refer to Section 6.5.2.4). This increase in impact is primarily due to the Green Hills corridor amendment, which would result in more of the proposed transmission line going through forestry land uses. Consultation with FCNSW is ongoing regarding the impact on forestry land, including finalising transmission line easements and associated compensation.

Assuming a loss of productivity at a rate of $1,300 per hectare for log harvesting, the economic cost would increase by approximately $799,110 annually. The net present value (NPV), calculated at a five per cent discount rate over 30 years, amounts to $12.3 million. Over 70 years it calculates to an NPV of $15.5 million. Multiplier impacts from forestry and logging are around 2:1 (ABS I-O tables). Hence a loss of $15.5 million in NPV could arguably result in a loss of $31 million, which reflects a worst-case scenario where the loss in forestry land could not be substituted. Notwithstanding, this loss remains negligible compared to the Gross Regional Product of $9.3 billion in the economic study area. The increase in the cost of forestry in

NPV terms over 70 years from the EIS estimate is around $4.5 million. Including the multiplier effects the increase is almost $8.9 million.

Transgrid would compensate forestry operators for any lost plantation forestry land in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991* and/or through the provision of replacement land. This approach would help minimise the reduction in forestry land available for timber supply.

6.6.3. Updated mitigation measures

No changes to the economic mitigation measures presented in the EIS are required as a result of the proposed amendments and refinements. The consolidated list of mitigation measures for the amended project is provided in Appendix B (Updated mitigation measures).

6.7. Social

6.7.1. Approach to assessment

Technical Report 7 – Social Impact Assessment Addendum assesses the potential social impacts from the proposed amendments and refinements to the project.

There has been no change to the legislative and policy context presented in *Technical Report 7 – Social Impact Assessment* prepared for the EIS.

The social locality (social study area) has been reviewed based on the scale and nature of the predicted social impacts for the amended project. The area of social locality reflects the considerations set out in the *Social Impact Assessment Guideline* (SIA Guideline) (DPE, 2023b). In general the social locality is unchanged between the EIS project and the amended project, however one additional key community (Tarcutta (ABS Reference UCL122128)) has been included in the assessment due to a new worker accommodation facility proposed within Tarcutta in the amended project (the Tarcutta accommodation facility and compound (AC03)).

The assessment has been prepared generally in accordance with the methodology outlined in *Technical Report 7 – Social Impact Assessment* prepared for the EIS. Additional tasks undertaken include:

- evaluation of the social locality and key communities in the context of the amended project footprint
- data gathering and desktop analysis
- targeted community and stakeholder engagement
- assessment of potential social impacts associated with amendments and refinements across the social locality and key communities within amended project footprint
- revision of residual significance impact ratings for the amended project.

6.7.1.1. Additional community and stakeholder engagement

As outlined in Chapter 5 (Engagement), Transgrid has continued to engage with affected landowners, local communities and other stakeholders throughout the development of the Amendment Report and Submissions Report. Community members who attended the community information sessions, street meetings and webinars were provided the opportunity to raise comments and feedback on the amendments and refinements, including the proposed new construction ancillary facilities. Key themes raised included:

- capacity of each proposed worker accommodation facility
- construction compound features
- traffic management and safety
- local business opportunities.

This was supplemented with targeted stakeholder engagement undertaken specific to the potential social impacts of the proposed amendments and refinements as described in *Technical Report 7 – Social Impact Assessment Addendum*. Key stakeholders invited for consultation were identified based on their expected sensitivity to potential impacts arising from the project amendments and refinements, specifically service providers in key communities near worker accommodation facilities and construction compounds.

Targeted stakeholder meetings were undertaken between December 2023 and January 2024. This included meetings with the Tumbarumba Chamber of Commerce, Rural Fire Service (RFS) Riverina – Wagga Wagga, Wagga Wagga City Council – Visitor Economy Development, Wagga Wagga Business

Chamber, Industry Capability Network NSW and Charles Sturt University. Key topics raised during the meetings centred on accommodation/tourism, business development/employment, impacts on traffic and the road network as well as housing affordability.

Additional details on key topics and themes raised by community and stakeholders are outlined in Appendix D (Engagement Outcomes Report).

The social issues and concerns raised from both general and targeted engagement were considered in the preparation of *Technical Report 7 – Social Impact Assessment Addendum*.

6.7.2. Assessment of amendments and refinements

6.7.2.1. Construction impacts

This section identifies and assesses the potential changes to social impacts that may arise during the construction of the project amendments and refinements.

The provision of additional temporary worker accommodation facilities is an important aspect of the amended project with potential to result in both positive and negative social impacts in the social locality. As a result of stakeholder and community feedback on the likely shortage in existing available accommodation in nearby towns and following further construction planning, five new combined worker accommodation facilities and construction compounds are proposed as part of the amended project. These new worker accommodation facilities are located in Tarcutta, Adjungbilly, Yass, Crookwell and Green Hills[3]. Worker accommodation facilities have been assessed throughout Table 6-20 for construction impacts against the social impact categories identified in the *SIA Guideline* (DPE, 2023b). The inclusion of additional worker accommodation facilities reduces a number of potential negative impacts associated with existing accommodation availability in nearby towns during construction, which was a concern identified from engagement conducted during the EIS and from submissions received on the EIS.

Table 6-20 summarises the potential social impacts that may occur as a result of the proposed amendments and refinements to the project. Where an impact is relevant to more than one impact category, it is reported in the most relevant category.

Table 6-20 Key potential social impacts during construction

Social impact category	Impact description
Way of life	
Availability and affordability of housing	The worker accommodation facility proposed as part of the EIS at Tumbarumba has been removed as this location was not suitable to facilitate the construction program, mainly due to its distance from other parts of the project footprint. The five new temporary worker accommodation facilities proposed as part of the amended project would be sufficient to accommodate most of the non-resident workers. This would assist in alleviating the pressure on short-term accommodation in nearby towns for tourists, the rental market and housing affordability. Some workers, such as those that are present on-site for a short period of time, may stay in local accommodation, resulting in benefits to these facilities. There would also be a small demand for local temporary accommodation during site establishment and demobilisation of the worker accommodation facilities. The number of workers required to be housed in existing accommodation during these stages would be substantially lower than the peak construction workforce, which would limit impacts on local accommodation availability.

[3] These would replace the worker accommodation facilities proposed at Tumbarumba as part of the EIS.

Social impact category	Impact description
	Consequently, the risk of worker accommodation requirements exceeding the private rental market availability, impacts on short-term tourist accommodation availability during construction and potential anxieties caused by perceptions of risk to local housing affordability have been greatly reduced as a result of this project amendment. While there may be minor increases in demand, this is not expected to materially affect affordability. As such, material social impacts related to the availability and affordability of housing are unlikely to occur. A Workforce and Workforce Development Plan will identify and plan for the daily needs of workers within the temporary worker accommodation facilities during construction and guide the management and mitigation of potential impacts arising from capacity constraints on existing social infrastructure, local goods and services as further assessed below in 'Accessibility'. The residual significance rating for the availability and affordability of housing for the amended project has reduced for this aspect compared with the EIS project from medium (negative) to low (negative).
Amenity	The amendments and refinements have changed the distribution and increased the number of locations that would experience potential amenity impacts associated with noise, vibration, dust, traffic and access and visual amenity within the amended project footprint. For example, the establishment and use of new temporary worker accommodation facilities and construction compounds proposed in the amended project would have the potential for additional amenity impacts including noise, traffic, visual and air quality impacts compared to the EIS project. The transmission line corridor changes mean that different people would experience impacts from construction of the transmission line. There may also be additional amenity impacts compared to the EIS project associated with the nomination of additional access tracks, telecommunications connections, expanded use of helicopters and drones as well as crushing and controlled blasting activities. This may be of concern to surrounding residences and the local community who value the existing amenity of their surroundings. Vulnerable groups (such as those with a daily need for physical assistance or elevated levels of psychological distress) may be more sensitive to construction noise and vibration, including disturbance from the movement of construction vehicles. However, this amenity impact would be temporary (ie limited to the duration of the construction in the worst-case) and minimised through several mitigation measures in Appendix B that have been developed to manage construction related noise and vibration, air quality, traffic and visual impacts. The residual significance rating related to disruptions to amenity from the amended project is medium (negative), which is unchanged from the EIS project. Refer to Sections 6.8, 6.9, 6.14 and 6.15 of this Amendment Report for further assessment of amenity impacts of the amendments and refinements.
Community	
Population changes from temporary construction workforce	The introduction of non-resident workers residing at the five combined worker accommodation facilities in Tarcutta, Adjungbilly, Yass, Crookwell and Green Hills may impact on the demographic characteristics and local community composition of local towns and population centres across the region. The changes in population from non-resident workers coming/going, and the presence of newcomers in the community, may impact on local community's way of life, cohesion, and function – including actual and perceived impacts. The population changes expected during construction as a result of the amendments include: • a general increase in population in the social locality from a maximum workforce of 1,600 workers during peak construction (increased from 1,200 workers in the EIS project), which represents a 0.9 per cent increase to the 2021 population of the social locality • a noticeable increase in population and change in demographic characteristics (such as a greater proportion of working age males) in towns near combined worker accommodation facilities and construction compounds, particularly Tarcutta, Batlow and Gundagai, which may temporarily impact on the way these communities function as well as people's sense of place and belonging • impacts as described in the EIS associated with the Tumbarumba accommodation facility (AC1) would no longer occur as this facility is no longer included in the amended project • reduced impacts to the population of local centres and therefore community composition compared to the EIS project, attributed to workers mostly being accommodated in dedicated combined worker accommodation facilities and construction compounds during construction as per the amended project.

Social impact category	Impact description
	These impacts would be minimised through the implementation of measures such as ensuring venues are well informed of the incoming workforce to plan for it, as well as providing guidance for the workforce on expected behaviours through a Code of Conduct (as well as informing the community as such). The residual significance rating for impacts from population changes for the amended project has increased compared with the EIS project from medium (negative) to high (negative) due to the large increase of projected workforce size proportionate to the local demographics, particularly in Tarcutta and Batlow.
Social cohesion	Impacts on social cohesion may affect community resilience and the sustained ability of local communities to withstand, adapt to, and recover from changes brought about by the amended project. The temporary worker accommodation facilities would be equipped with catering, recreational and first aid facilities, minimising the necessity for workers to venture into local towns. However, there is also the likelihood that workers visit the local towns during their time off shift for leisure or social purposes. This may impact on existing residents' feelings of connection to their community, such as potentially feeling increased levels of anxiety and uncertainty due to new faces in the local towns and the composition of that incoming population (predominantly working-age males). Nonetheless, the frequency of workers visiting local towns may be relatively infrequent (eg during evenings and weekends) and may also be absorbed into the occasional influx of tourist populations visiting nearby attractions. As such, any occasional worker presence in local towns is expected to have negligible impacts to the social cohesion of the existing local community. The construction workforce may have little or no attachment to surrounding communities (except for workers who are also local residents). There is a potential for some community-shared spaces, such as local pubs, sport and recreation and other amenities to experience increased patronage from the temporary workers. Sudden boosts in outsider numbers may raise concerns in local communities and exacerbate existing concerns about the introduction of new residents. As such, the presence of temporary workers in local towns is expected to have minimal to moderate impacts on the social cohesion, particularly in smaller communities of Tarcutta and Batlow. Where workers interact with the community (to access services not available within the combined worker accommodation facilities and construction compounds), it is considered that any impacts to community cohesion would be experienced proportionately to the ratio of the temporary workforce to the existing resident population. As such, impacts to social cohesion would be lower in the larger regional cities of Yass and Goulburn where the impact of population change is less and potentially more likely in the smaller key communities of Tarcutta and Batlow, which may experience minor, temporary negative impacts to social cohesion. Impacts on social cohesion would be mitigated by providing workers with a Code of Conduct including standards of behaviour, information on the local community and supporting the provision of services within the combined worker accommodation facilities and construction compounds. Additionally, local communities will need to be well informed about the new incoming workforce, along with local services and facilities so they are able to plan and prepare for this incoming population and they have opportunities to raise issues and concerns in advance, which may be resolved through strong, effective and ongoing communication channels. The residual significance rating for impacts to social cohesion for the amended project has increased compared with the EIS project from medium (negative) to high (negative) due to the large increase of projected workforce size proportionate to the local demographics, particularly in Tarcutta and Batlow.
Accessibility	
Transport and movement	During engagement activities, stakeholders in Tarcutta, Batlow, Tumbarumba, and Gunning shared concerns around traffic and transport including road use, heavy vehicle movement, increased traffic volumes, road safety and traffic and safety management plans. It is anticipated that workers would regularly move between their accommodation and construction work sites, which would create additional vehicles on the surrounding road network including light and heavy vehicle traffic. A concentration in vehicle movements may occur in locations where work is taking place, however such increases would be temporary and transient. As such, there would be a minor, intermittent impact to how people throughout the social locality get around and undertake their daily responsibilities. The amended project includes nomination of additional access tracks to provide access during construction and operation. It is noted that some different road users would experience traffic and

Social impact category	Impact description
	access impacts where the transmission line corridor has been amended or where new construction ancillary facilities are proposed in the amended project, as different access routes would be used compared to those identified for the EIS project. The Green Hills corridor amendment would reduce the potential impacts to transport and access in that area, as construction vehicles accessing the amended transmission line corridor through Green Hills State Forest would primarily do so via existing forestry access roads. As a result of the amended construction compounds and combined worker accommodation facilities and construction compounds, transport and movement impacts would be experienced differently compared to those presented in the EIS for some key communities, such as in Tarcutta (which is a new key community considered for the amended project). However, vehicle movements for construction would be concentrated on roads surrounding the construction compounds and worker accommodation facilities and would result in low additional road volumes on major routes in the context of existing traffic volumes. To further reduce traffic impacts from private car usage, minibuses have been proposed for some worker accommodation facilities to transport workers to and from construction work sites. With incorporation of appropriate traffic management measures, a negligible to minor impact on the road operating conditions and on road safety is expected and the residual significance rating for transport and movement for the amended project remains at medium (negative), which is unchanged from the EIS project.
Social infrastructure	Construction workers would likely access various services in local towns and population centres to maintain wellbeing – even though some infrastructure will be provided on-site in the temporary accommodation facilities. This would create a relatively short-term increase in the demand for social infrastructure in those localities during the construction period. At the key community scale, the concentrations of workers at the combined worker accommodation facilities and construction compounds in smaller centres have the potential to place additional strain on existing social infrastructure such as health and medical facilities, emergency services, leisure and recreational facilities. Additionally, amenities in these towns such as retail and food and beverage outlets (including licensed premises) are also likely to be impacted by increased demand. In particular, the high proportion of workers at the nearby accommodation facility in Tarcutta compared to the existing population of the town has the potential to affect residents' ability to access key social infrastructure, which may lead to negative health and wellbeing impacts such as stress or poorer physical health outcomes. For that reason, site-based social infrastructure (such as food and drink, and recreation facilities, gymnasium, parking spaces and first aid facilities) would be provided to support the worker population in the combined worker accommodation facilities and construction compounds, to minimise the risk that an increase in demand for social infrastructure from non-resident workers would reduce local residents' access to facilities and services. Transgrid would continue to consult with providers of community services and social infrastructure (including local health and emergency services) in key communities as required throughout construction to establish processes for managing increased demand due to the workers. Workers would also be provided with information on accessing medical services including options for telehealth service options outside the social locality (eg Canberra or Sydney) to minimise demand on local practitioners. As such, the social impact significance related to accessing social infrastructure has been rated as medium (negative) for the amended project, which is unchanged from the EIS project.
Availability of goods and services	The influx of non-resident workers earning above median salaries would inherently cause localised increases in demand for goods and services. This can create hyperlocal 'booms' leading to inflation and putting pressure on affected communities. The impacts arising from scarcity of goods and services are most likely to be felt at the key community scale, particularly in locations where the temporary workforce would add a significant proportion to the existing population (eg Tarcutta and Batlow) and where low-income households are most concentrated, for example in vulnerable Aboriginal and Torres Strait Islander communities highly represented in the key communities at Tumut and Tumbarumba. The influx of workers during construction may increase patronage and trade for local businesses and present opportunities to expand sales with potential to create broader economic benefits across the region. However, concern regarding local business fatigue has been noted in consultation. Engagement and clear communication with the community and stakeholders will enable effective business planning to address potential increased trade. This would continue throughout the construction of HumeLink.

Social impact category	Impact description
	Impacts arising from scarcity of goods and services are still expected to be minor in scale and temporary (limited to the duration of the construction period in the worst-case) particularly if proactive stakeholder engagement takes place so local providers are informed in advance and can manage stock levels accordingly. Therefore, social impact potentially arising from availability of goods and services is expected to remain unchanged for the social locality and the key communities as low (negative).
Utilities and telecommunications	There is potential for the project to alter existing utilities and connectivity regimes during construction which may result in temporary service interruptions. This may also occur through inadequate capacity in systems for additional demand generated by non-resident workers. However, the combined worker accommodation facilities and construction compounds would have telecommunications and internet access which should meet a significant portion of the demand. As such, there would be no impacts on existing local utilities and telecommunications as the workers are largely contained within combined worker accommodation facilities and construction compounds, which provides these. As such, the residual significance rating for utilities and telecommunications has reduced in the amended project compared with the EIS project from medium (negative) to low (negative).
Culture	
Connection to Country	The amended project footprint has been developed in a region of complex and diverse Aboriginal and Torres Strait Islander culture, with valued natural assets, sacred sites, and objects of cultural heritage significance. Construction impacts on Aboriginal heritage associated with Connection to Country are summarised in Section 6.3.2.1. Traditional Owners and other Aboriginal and Torres Strait Islander groups that participated in consultation carried out for the amended project raised no specific concerns in terms of culture of connection to Country. Overall, the residual significance rating for social impacts on connection to Country from the amended project would remain the same as the EIS, which was medium (negative).
Non-Aboriginal culture	Construction impacts associated with non-Aboriginal heritage are summarised in Section 6.4.2. Two additional local heritage listed items have curtilages that are partially within the amended project footprint as a result of the Tarcutta accommodation facility and compound (AC03) and as a result the construction of access tracks in Yass. Considering that two additional local heritage-listed items are within the amended project footprint and nineteen additional items are near it, it is anticipated that there might be increased stakeholder concerns around potential impacts on community-valued features or perceived impacts as local heritage-listed items. Perceived impact on the aesthetics of a place valued by the community may impact how people use or appreciate it and, therefore, may affect the sense of identity with a place. However, there haves been no material changes to the overall impact of the amended project on non-Aboriginal heritage, with only the curtilage and not the items themselves intersecting with the amended project footprint. As a result, the assessed residual social impact on non-Aboriginal culture is unchanged from the EIS project as low (negative).
Health and wellbeing	
Community health and wellbeing	Impacts to community health can arise directly from construction activities through exposure to noise, light spill, dust or hazardous materials, or accidents on roads. Construction impacts from the amendments and refinements in relation to noise and vibration, air quality and traffic are summarised in Sections 6.9, 6.14 and 6.15 as well as above under 'Amenity'. The residual significance rating is considered to increase from the EIS project from low (negative) to medium (negative) due to the changes in ancillary facilities proposed near communities.
Health and wellbeing of construction workers	As discussed in Chapter 13 (Social) of the EIS, temporary workers can suffer from increased stress levels and poorer health including depression, binge drinking, recreational drug use and obesity (Morris, 2012). These risks are still present for the amended project but reduced in likelihood due to workers being accommodated within purpose-built combined worker accommodation facilities and construction compounds. The severity of impacts may also be reduced through better management of health and wellbeing within combined worker accommodation facilities and construction compounds such as catering with healthy food options and provision of health and recreation facilities. Overall, the amended project's residual significance rating for health and wellbeing has reduced compared with the EIS project from medium (negative) to low (negative).

Social impact category	Impact description
Surroundings	
Landscape and visual amenity	Changes to the amended project footprint would result in a changed distribution as well as magnitude of impacts from visible construction activities, additional night-time lighting in rural areas, plant and equipment and removal or pruning of vegetation within the amended project footprint. This may temporarily disrupt the views and amenity for residences located near the amended project footprint for the duration of the nearby construction activities, particularly at locations of high contrast between introduced construction activity and the rural landscape character (refer to Section 6.8 for more detail on the landscape and visual impacts expected from the amended project). This is likely to affect a higher number of residents in these areas, causing stress and anxiety and may affect people's enjoyment of their local areas and sense of pride. Community members may also feel concern about loss of biodiversity where clearing is undertaken within the amended project footprint. Impacts to local environmental values could impact sense of place and attachment to the local environment. However, while there are some newly introduced construction facilities in the amended project footprint, there are also several construction facilities proposed in the EIS which have been relocated or removed altogether. The overall landscape and visual impacts and associated social impacts from the amended project result in changes to surroundings for nearby residents are therefore considered to be largely the same as the EIS (high (negative))– even though they would impact different areas.
Livelihoods	
Employment opportunities	The amended project would result in an overall increased capital investment with a consequent net increase in jobs compared to the EIS project. Workers who might be on-site for a short period during site establishment and demobilisation would increase demand for local temporary accommodation, benefiting local businesses, including accommodation and hospitality services suppliers. The influx of construction workers may also encourage increased patronage and expenditure on local businesses. During stakeholder consultation, some businesses highlighted the economic potential of an increased workforce in their region. Section 6.6.2.1 provides further detail on the economic benefits associated with employment generated from construction of the project. Overall the amended project residual significance rating for livelihoods (employment opportunities) remains very high (positive), unchanged from the EIS project.
Compensation to landowners	The majority of tenure and ownership arrangements arising from the construction of the amended project would be minor due to the short-term nature of the leasing requirements, or existing ownership of land by Transgrid. While the quantum of land acquisition and affected dwellings has slightly increased compared to the EIS project, the magnitude of any potential impacts remains the same as assessed in Chapter 13 (Social) of the EIS. Any removal of dwellings or other private structures would place a cost and productivity burden on landowners and could lead to displacement. For these landowners, uncertainty, stress and disruption to day-to-day life would be significant impacts. As such, Transgrid will continue engagement with affected landowners to ensure that impacts are mitigated where possible, and that compensation follows a legislated process. This compensation may be beneficial to the identified landowners by providing improved livelihoods and offsetting costs associated with the project. Overall the amended project residual significance rating for livelihoods (compensation to landowners) remains high (negative), unchanged from the EIS project.
Tourism	With workers to be housed within dedicated temporary worker accommodation facilities for the majority of construction of the amended project, the potential impacts to overall availability of short-term accommodation has been reduced compared to the EIS project. Furthermore, potential benefits arising from potential tourism by workers over the construction period would remain, with some project workers visiting local tourism destinations on non-working days. The introduction of dedicated worker accommodation facilities has resulted in reduced likelihood of impacts to tourism livelihoods, resulting in a reduced residual impact significance compared with the EIS, from medium (negative) to low (negative).

Social impact category	Impact description
Adjustments to land use and primary production	The amended project changes the areas of different productive lands that the amended project footprint intersects (particularly, an increase in agricultural land and forestry land as a result of nomination of access tracks and the Green Hills corridor amendment, respectively). Temporary livelihood impacts from construction activities resulting in loss of productivity within the agricultural and forestry industries would be of increased significance due to their importance to local communities and economies in the south of the social locality. However, social impacts arising from any such changes to land impacted by construction ancillary facilities and work sites would be minimised due to most of the affected land being returned to its previous use once construction is complete. Work to facilitate the restoration of the affected land would be undertaken in discussion with the relevant landowner. Section 6.5.2.1 provides further discussion on the land use and property impacts from construction of the amended project. Overall, the residual impact significance compared with the EIS has increased from medium (negative) to high (negative) due to the increases in land that would require adjustment compared to the EIS project.
Decision-making systems	
Acquisition and leases	The impacts to decision-making systems as assessed in the EIS remains generally the same, except the spatial locations of the impacts would change in some locations aligned with the amended project footprint. Identified impacts include risks of unmet expectations and perceived procedural unfairness during the lease and land acquisition process, which could lead to landowners perceiving that their decision-making systems have been compromised. Overall, it is considered that the amended project would not result in a change to residual social impacts rating as assessed in the EIS, which was high (negative).

6.7.2.2. Operational impacts

Social impact significance ratings for operational impacts as outlined in *Technical Report 7 – Social Impact Assessment* prepared for the EIS have largely remained the same throughout the assessment of amendments and refinements of the project. However, where a social impact or significance rating has changed it has been noted within Table 6-21. There has been negligible change to social impacts (community, accessibility, culture and decision making systems) as a result of the amendments and refinements compared to the EIS project.

It is noted that the Green Hills corridor amendment was originally proposed by the community, and as such, this amendment has generally reduced potential social impacts compared to the previous corresponding section of the transmission line corridor in the EIS project.

Table 6-21 Key potential social impacts during operation

Social impact category	Impact description
Way of life	
Amenity	The amended project includes realigning the transmission line corridor through Green Hills State Forest to the west of Batlow. Transgrid selected the community-proposed Green Hills corridor amendment after consultation and engagement with the community, landowners and other stakeholders. The Green Hills corridor amendment would reduce visual impacts in the Batlow area as the dense tree cover in much of this area would obstruct views to the amended project. However, there are newly introduced day-time visual impacts as a result of the operation of the amended project, particularly views from Tumbarumba Road, Yaven Creek Road and Batlow Road (refer to Section 6.8.2). This would affect the appreciation of the visual amenity values for locals on these streets. Predicted noise emissions from the proposed Gugaa 500 kV substation have increased due to a change in equipment and layout and would potentially produce operational noise impacts.

Social impact category	Impact description
	However, further design refinements would be adopted during detailed design so that no exceedances of the adopted noise level criteria are expected at nearby residential receivers. The total number of residential receivers predicted to have potential transmission line noise impacts has increased due to the operation of the transmission line between the existing Wagga 330 kV substation and proposed Gugaa 500 kV substation at 500 kV under the amended project. However, for each residence where potential operational noise levels are predicted to exceed criteria, noise monitoring to confirm actual operational noise levels would be carried out and consultation will be undertaken with the landowner of the affected residence to identify solutions. As such, with design mitigations in place for the proposed Gugaa 500 kV substation and transmission line, the potential impacts described above are not considered to change the low (negative) residual significance impact to way of life as presented in the EIS.
Health and wellbeing	
Perceived risk of bushfire	Once operational, the amended project footprint may increase fears of bushfire and elicit anxieties from those located in or near the amended project footprint, particularly with many in the community recalling the impacts of recent bushfires. The Green Hills corridor amendment is largely within Category 1 Bush Fire Prone Land. Category 1 Bush Fire Prone Land generally supports the highest intensity bushfires and are considered the highest risk vegetation. During operation, Transgrid uses its long established asset management and network safety management systems to reduce bushfire risk. When combined with proactive engagement and timely communication to manage perceptions about the risk of bushfires, the impact on mental health and well-being associated with increased stress and anxiety would be reduced. Information regarding available mitigation measures and the residual bushfire risks would be made available to concerned parties regarding bushfire risk. The social impact of the amended project on health and wellbeing due to perceived risk of bushfire remains unchanged from the EIS as low (negative).
Surroundings	
Ongoing visual impacts and changes to landscape character	The visual impact of the amendments and refinements to the project may contribute to a sense of loss when viewed by local residents who may have formed an attachment to particular viewpoints and vistas within the landscape. Amendments and refinements to the project present the same almost certain and moderate localised impacts, however the impacts would be in different locations and experienced by different sensitive receivers along the amended project footprint compared to the EIS project footprint. The amendments to the transmission line corridor, most notably the Green Hills corridor amendment, were introduced following specific requests by the community, with other minor corridor refinements undertaken in consultation with relevant landowners. As such, many of these changes may mitigate fears or concerns around impacts to surrounds from potentially impacted receivers. *Technical Report 8 – Landscape Character and Visual Impact Assessment Addendum* noted a moderate-low level increase to impacts at Batlow Road, where there would be a new crossing point of this road which is a scenic route. Significant vistas within the landscape and visual study area would continue to be unaffected. Nearby residents would experience positive views of the overall character and amenity values and appreciate the surroundings. In some areas, where the corridor no longer passes through open country particularly the Green Hills corridor amendment, the visual impact may be lessened with better screening from view. As such, along with the other minor corridor refinements, the residual impact significance rating would be reduced from high (negative) to medium (negative).
Livelihoods	
Adjustments to land use and primary production	Operational impacts to livelihoods within the social locality have been considered to potentially arise from changes in land use through loss of productive land including forestry and agriculture. This could impact upon the capacity of landowners in the amended project footprint to undertake some existing agricultural activities on a day-to-day basis, thereby impacting livelihoods.

Social impact category	Impact description
	The amended project would directly impact an increased amount of forestry land compared to the EIS project, largely due to the Green Hills corridor amendment, which increases potential impacts to forestry operations. The total agricultural area affected by operation of the amended project has also increased compared to the EIS project, which is largely related to changes to the assessed area of access tracks to be retained. Refer to Section 6.5 for further discussion on land use and property impacts from the amended project. Potential loss or reduced functionality of agricultural or forestry land would be offset through the acquisition and compensation process in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991*. Transgrid may also provide forestry operators with replacement land. This approach would help minimise the reduction in forestry land available for timber supply. Overall the residual significance of impacts to livelihoods is considered medium (negative), which is unchanged from the EIS project.

6.7.3. Updated mitigation measures

The approach to avoidance/minimisation and management of social impacts remains consistent with the approach provided in Chapter 13 (Social) of the EIS. One new mitigation measure (SO5) has been developed to manage impacts on local social infrastructure and services from the introduction of temporary worker accommodation facilities. Mitigation measure SO1, as proposed in the EIS, has been removed as the intent of this mitigation measure has already been fulfilled through the inclusion of additional worker accommodation facilities in the amended project. Mitigation measure SO4 has been updated to clarify that consultation will include relevant landowner/s, and updating the timing and applicable amended project locations. The updates are shown in **green** and ~~**strikethrough**~~ in Table 6-22. The consolidated list of mitigation measures for the amended project is provided in Appendix B (Updated mitigation measures).

Table 6-22 Summary of revised and new social mitigation measures

Reference	Impact	Mitigation measures	Timing	Relevant location
~~**SO1**~~	~~**Accommodating temporary construction workers**~~	~~**Prepare and implement a Worker Accommodation Strategy for the construction workers during the construction period.**~~	~~**Detailed design and construction**~~	~~**All locations**~~
SO4	Opportunities for long-term ~~investment~~ **community benefit**	Any opportunities for appropriate long-term use for the worker accommodation facilities **(or component parts thereof)** will be identified in consultation with councils **and the relevant landowner/s**.	Detailed design **and construction**	Worker accommodation ~~**facility**~~ **facilities**
SO5	**Impacts on local services from introduction of temporary workers**	**Each worker accommodation facility will include appropriate food and catering facilities, fitness and recreational facilities, parking spaces and first aid facilities.**	**Detailed design and construction**	**Worker accommodation facilities**

6.8. Landscape character and visual amenity

6.8.1. Approach to assessment

6.8.1.1. Overview

Technical Report 8 – Landscape Character and Visual Impact Assessment Addendum assesses the potential landscape character and visual impacts from the proposed amendments and refinements to the project.

There has been no change to the legislative and policy context presented in *Technical Report 8 – Landscape Character and Visual Impact Assessment* prepared for the EIS, except for updates to how amendments and refinements have been considered against local planning schemes. The *Draft Technical Supplement for Landscape and Visual Impact Assessment* has not been adopted in preparation of *Technical Report 8 – Landscape Character and Visual Impact Assessment Addendum* as it was released after the SEARs and after the submission of the EIS.

The assessment of the amendments and refinements has been prepared in accordance with the assessment methodology outlined within *Technical Report 8 – Landscape Character and Visual Impact Assessment.* As a result of the amended project footprint and issues raised in the community and stakeholder submissions on the EIS, preparation of the addendum assessment involved carrying out:

- an additional site inspection in October 2023 to update the representative viewpoint assessment
- adjustments to the landscape character zones and sub-character areas to reflect the amended project footprint. Changes to the landscape character zones are outlined in Section 6.2 of *Technical Report 8 – Landscape Character and Visual Impact Assessment Addendum*
- assessment of potential additional or changed landscape character and visual impacts of the proposed amendments to the project
- preparation of revised photomontages where the amended project materially altered the view
- preparation of additional 3D modelled views for all non-easement affected dwellings with an impact rating of moderate or higher, or where the preparation of a 3D modelled view assisted in illustrating the visual impact from a new section or feature of the amended project consultation with the relevant councils and community groups, refer to Chapter 5 (Engagement) for further information on engagement.

6.8.1.2. Revised viewpoints

The assessment of the proposed amendments and refinements included consideration of the landscape and views previously assessed for the EIS and where necessary, additional views to identify the potential visual impacts of the amendments and refinements in areas where the EIS did not assess project infrastructure.

To consider the changes to the amended project, six views from the EIS have been reassessed and eight views have been added to represent a range of views to the amended project. The additional viewpoints have been selected to represent views where the level of impact had the potential to change as a result of the amended project.

Viewpoints from the EIS report that have been reassessed include:

- Viewpoint 2: View south from Livingstone Gully Road
- Viewpoint 3: Views from Tumbarumba Road
- Viewpoint 6: Views from Yaven Creek Road
- Viewpoint 9: View east from The Big Apple, Stewarts Road, Batlow
- Viewpoint 13: View south-east from Brungle Road
- Viewpoint 24: View south-west from Grabben Gullen Road.

New viewpoints that have been assessed include:

- Viewpoint 29: View north-east from Mates Gully Road
- Viewpoint 30: View south-west from Wondalga Road (north)
- Viewpoint 31: Views from Wondalga Road (south)
- Viewpoint 32: Views north-west from Green Hills Access Road
- Viewpoint 33: View south-west from Batlow Road
- Viewpoint 34: View north from Adjungbilly Road
- Viewpoint 35: Views from Faulder Avenue, Yass
- Viewpoint 36: View from Woodhouselee Road.

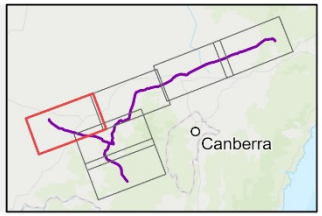
Additional views from the air have also been reassessed for the amended project.

The amended viewpoints are shown in Figure 6-5. Where there are no changes to the impact or viewpoint from the EIS, these are indicated on Figure 6-5.

Amended project footprint
Amended landscape character study area
Railway
Waterway
Substation

Viewpoints

No change from EIS
Reassessed EIS location
New location



Source: *Aurecon, Transgrid, IRIS, Spatial Services (DCS), ESRI Basemap*

1:200,000
0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-5a: Amended project footprint viewpoints

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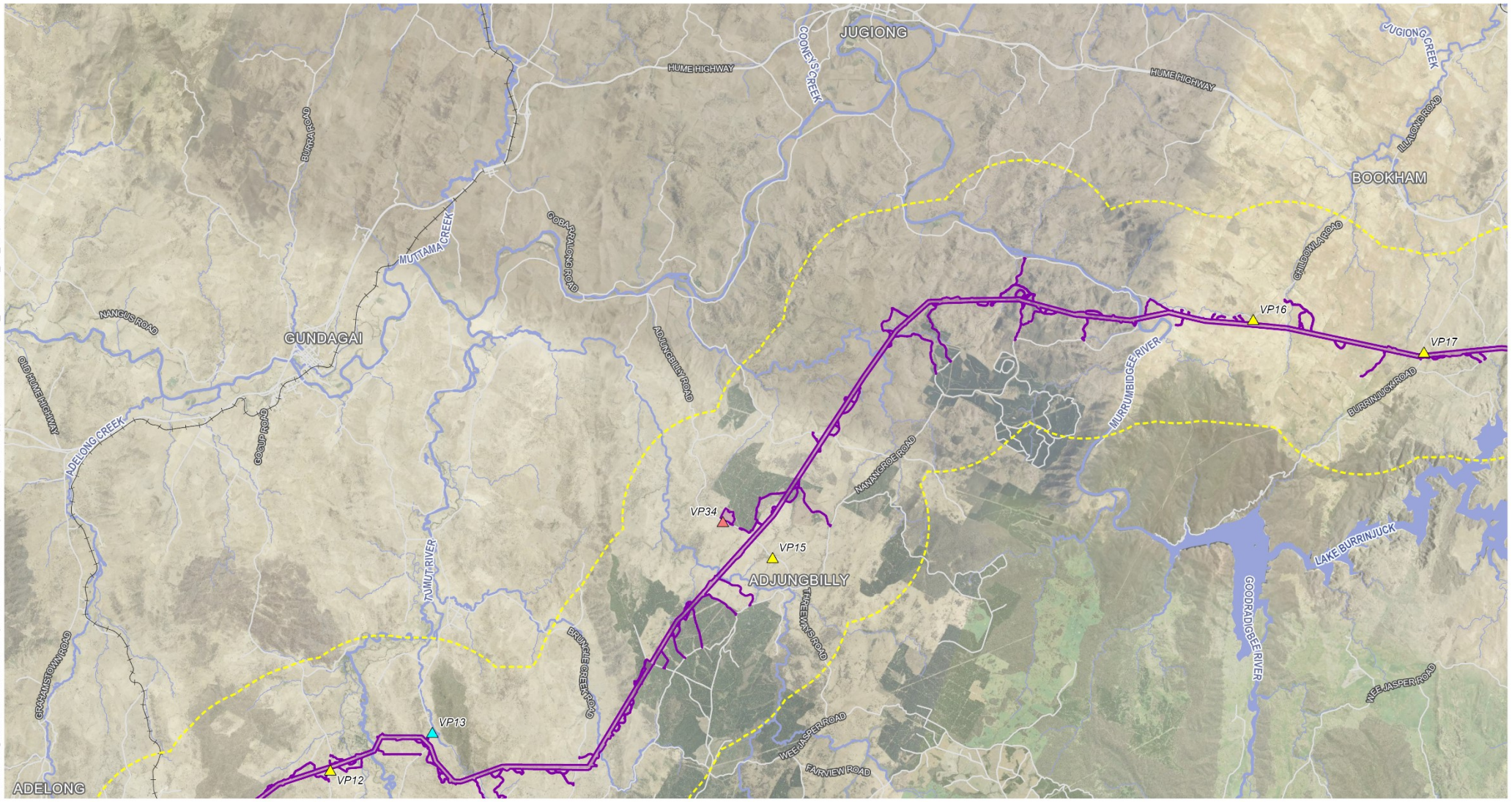


Amended project footprint

Amended landscape character study area

Railway

Waterway

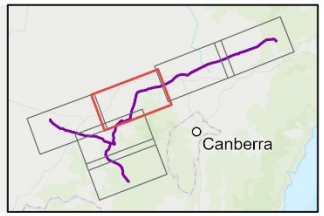
Substation

Viewpoints

No change from EIS

Reassessed EIS location

New location



Source: *Aurecon, Transgrid, IRIS, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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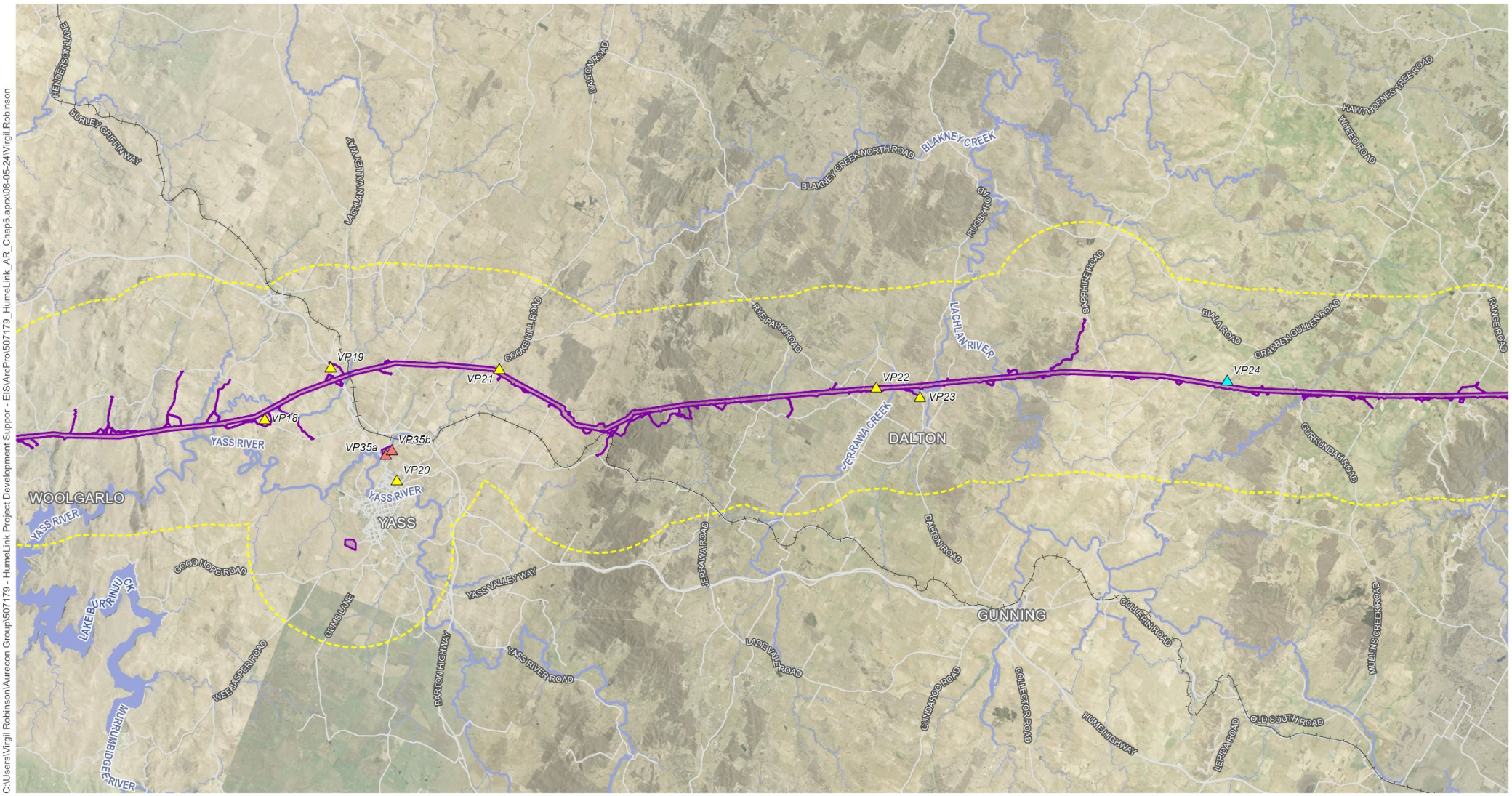
FIGURE 6-5b: Amended project footprint viewpoints



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Source: *Aurecon, Transgrid, IRIS, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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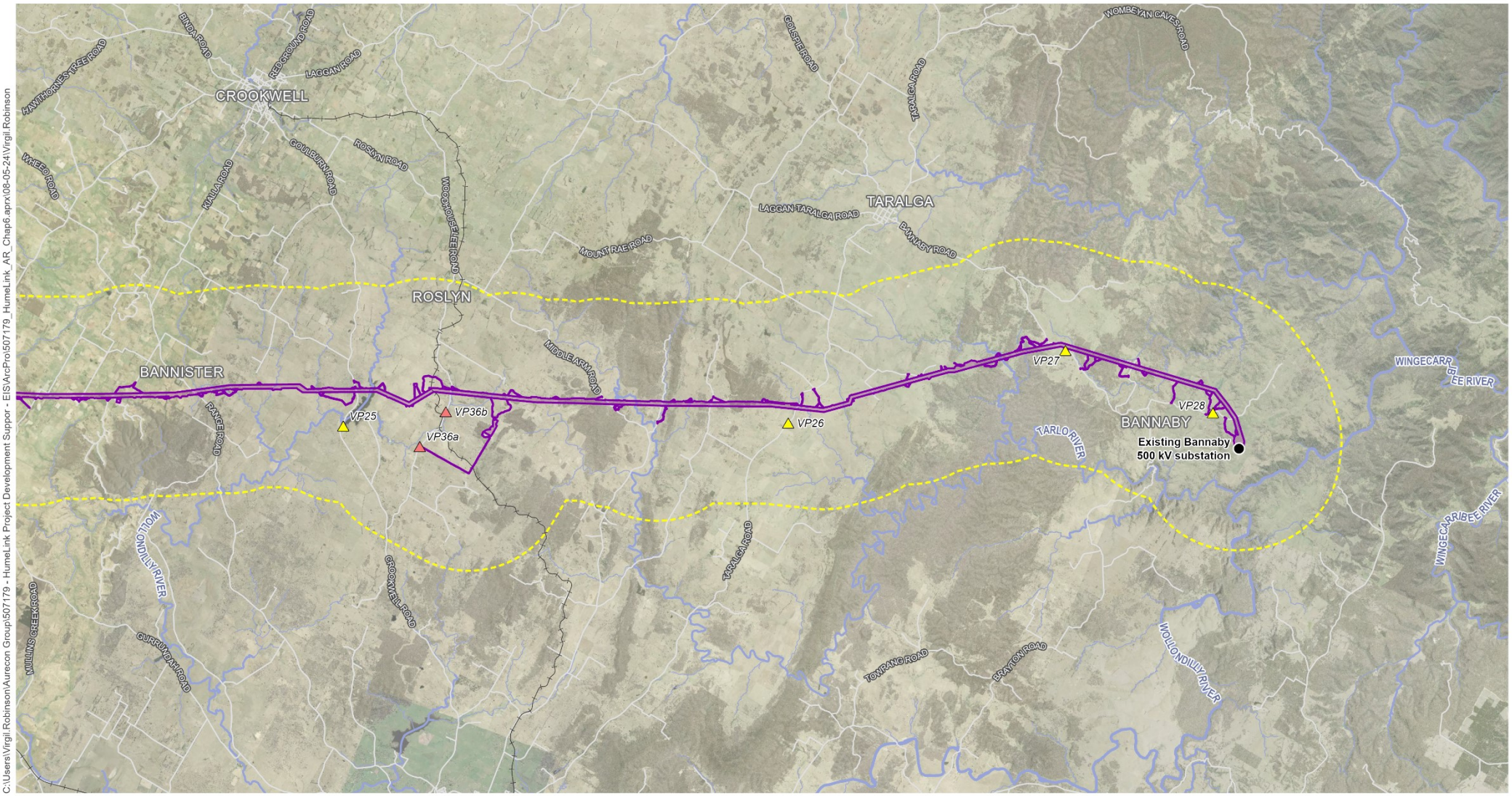
FIGURE 6-5c: Amended project footprint viewpoints



Source: *Aurecon, Transgrid, IRIS, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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FIGURE 6-5d: Amended project footprint viewpoints

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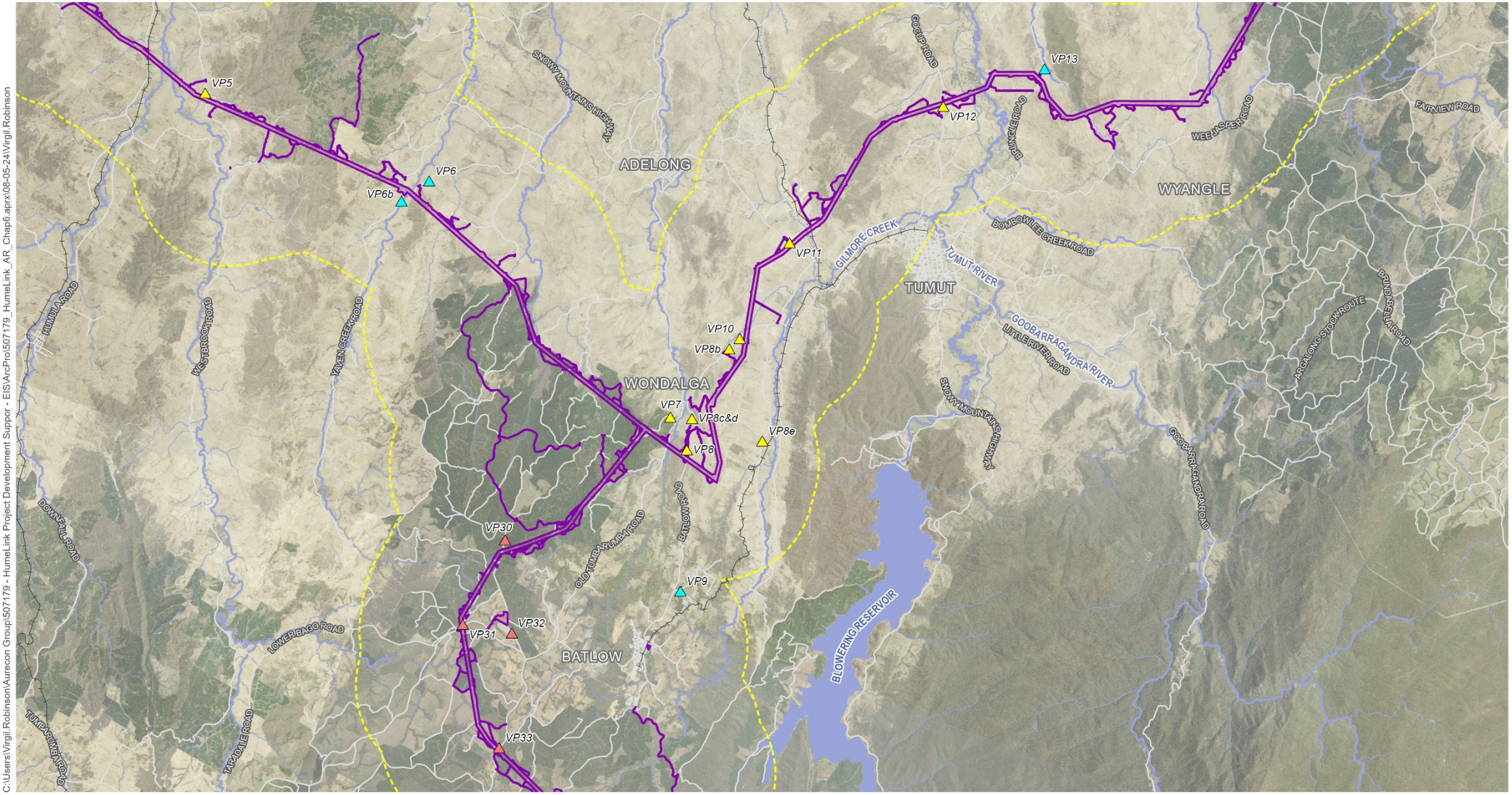

Amended project footprint
Amended landscape character study area
Railway
Waterway
Substation
Viewpoints
No change from EIS
Reassessed EIS location
New location

Source: *Aurecon, Transgrid, IRIS, Spatial Services (DCS), ESRI Basemap*

1:200,000
0 4 8km

Projection: GDA 1994 MGA Zone 55

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FIGURE 6-5e: Amended project footprint viewpoints

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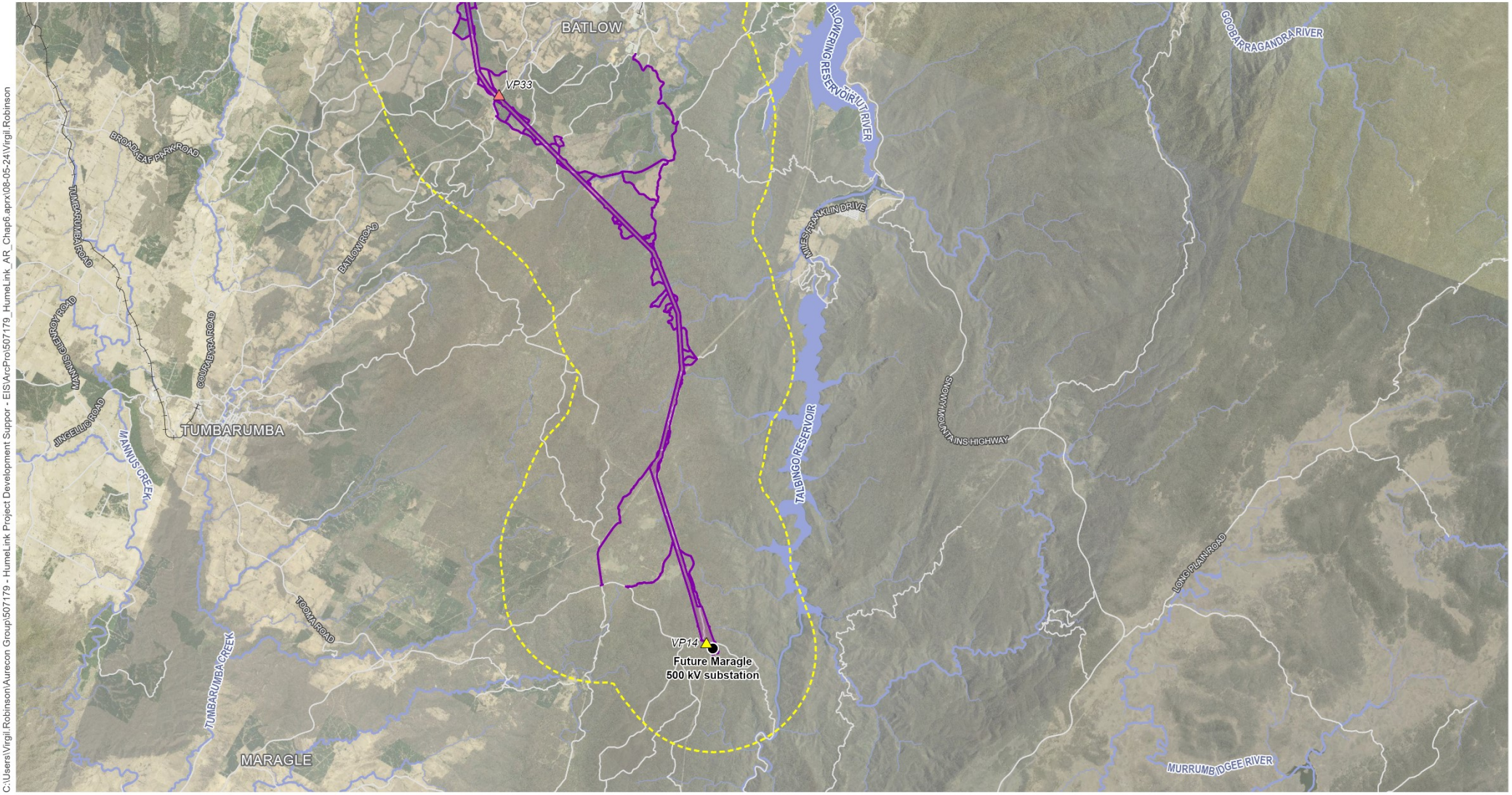

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Amended project footprint

Amended landscape character study area

Railway

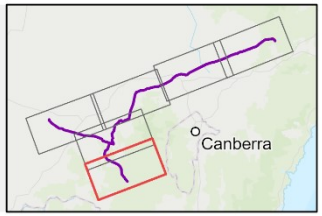
Waterway

Substation

Viewpoints

No change from EIS

New location



Source: *Aurecon, Transgrid, IRIS, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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FIGURE 6-5f: Amended project footprint viewpoints

6.8.2. Assessment of amendments and refinements

6.8.2.1. Landscape character

The landscape character zone and sub-character area descriptions in the EIS remain relevant to the assessment of the amended project. Where the project has changed, the assessment of the corresponding landscape character zones and sub-character areas has been assessed.

During construction and operation of the amended project there would be predominantly low, moderate-low and moderate landscape character impacts, consistent with the findings of the EIS. This includes reduced landscape character impacts in the Tumbarumba rural valleys sub-character area and an increase in the impact on the Green Hills forested hills sub-character area. A summary of the change in landscape character impacts during construction and operation as a result of the project amendments and refinements where there has been a change from the EIS is shown in Table 6-23.

The description of impact levels in Table 6-23 is consistent with those presented in the EIS and outlined in *Technical Report 8 – Landscape Character and Visual Impact Assessment Addendum.* Note, a negligible impact level has been identified for some aspects where there would no longer be an impact due to changes in the amended project.

Table 6-23 Summary of the changes to the landscape sub-character area impacts from the EIS

Landscape sub-character area	Landscape character zone	Sensitivity level	EIS impact level	Amended impact level
Construction				
Yaven Creek and Adelong Creek rural valleys	Rural Valleys landscape character zone	Local	Moderate-low	Moderate
Tumbarumba rural valleys		Local	Moderate-low	Negligible
Green Hills forested hills	Forested Hills landscape character zone	Local	Low	Moderate-low
Batlow undulating rural hills and ridges	Undulating rural hills and ridges landscape character zone	Regional	Moderate	Moderate-low
Crookwell rural tablelands	Rural tablelands landscape character zone	Local	Moderate-low	Moderate
Operation				
Bago forested hills	Forested Hills landscape character zone	Local	Moderate -low	Low
Batlow undulating rural hills and ridges	Undulating rural hills and ridges landscape character zone	Regional	Moderate	Negligible

6.8.2.2. Day-time visual impact

Viewpoints that have been reassessed are summarised in Table 6-24. New viewpoints that have been assessed are summarised in Table 6-25. In summary, the visual impacts from public viewpoints as a result of the amended project, include:

- increased visual impacts in the vicinity of the proposed Gugaa 500 kV substation, due to the revised location and slight expansion of this facility
- similar visual impacts from Tumbarumba Road and Yaven Creek Road, where the impacts would occur in slightly different locations
- reduced visual impacts from Stewarts Road in Batlow, due to the realignment of the transmission line corridor, away from this local roadway

- new moderate-low and low visual impacts on views during construction in the vicinity of temporary ancillary facilities, due to the temporary construction facilities
- negligible visual impacts from Wondalga Road and the Green Hills Access Road, due to the low sensitivity of forestry uses
- no impact on views from Courabyra Road, due to removal of the Tumbarumba accommodation facility (AC01).

The description of impact levels in Table 6-24 is consistent with those presented in the EIS and outlined in *Technical Report 8 – Landscape Character and Visual Impact Assessment Addendum.* Note, a negligible impact level has been identified for some aspects where there would no longer be an impact due to changes in the amended project.

Table 6-24 Summary of visual impacts for amended viewpoints

Viewpoint	Visual sensitivity	Timing	Magnitude of change	EIS project visual impact	Amended project visual impact
Viewpoint 2: View south from Livingstone Gully Road	Neighbourhood	Construction	Construction of the proposed Gugaa 500 kV substation and Amended Gregadoo Road compound (C06) would be more prominent in this view, with the substation located closer to Livingstone Gully Road and more visible. While there is existing transmission line infrastructure in this view, the scale and extent of energy infrastructure would, with no notable screening by vegetation or landform, result in a very high magnitude of change.	Moderate-low	Moderate
		Operation	The substation would be a prominent, large-scale piece of infrastructure in the fore and middle ground of this view. There would be additional infrastructure at the proposed Gugaa 500 kV substation to the view assessed in the EIS, including additional electrical equipment/conductors. Areas impacted by the Amended Gregadoo Road compound (C06) would have been reinstated and restored to rural use.	Moderate-low	Moderate
Viewpoint 3: View south-west from Tumbarumba Road	Local	Construction	The amended project footprint would be relocated to the south, away from the existing transmission line easement. The vegetation would screen views to the ground level construction activity along the easement, within the amended project footprint.	Moderate	Low
		Operation	The upper section of the transmission line structures would be visible, rising above the canopy. The structures would be much larger in size, ranging between 50 and 76 m tall, about double to triple the height of the existing structures, with a more elongated shape, and spaced at wider intervals so that there would be less transmission line structures.	Moderate-low	Low
Viewpoint 3b: View north-east from Tumbarumba Road	Local	Construction	The clearing of vegetation, to the west of Tumbarumba Road alongside Kyeamba Creek, and the construction at several transmission line structure sites would be seen from this location, extending either side of the road and into the background of the view.	Not assessed in EIS	Moderate
		Operation	While the amended project would be seen in the context of the existing transmission line, the new transmission line structures would be much larger in size and spaced at wider intervals, so that there would be less transmission line structures than described in the EIS.	Not assessed in EIS	Moderate-low
Viewpoint 6: View south from Yaven Creek Road	Neighbourhood	Construction	There would be a greater number of construction vehicles and machinery visible within the easement than anticipated in the EIS. While the undulating terrain and scattered trees would partially screen views to some of the transmission line structure sites, and much of the Ellerslie Road compound (C21), the machinery used to install the structures and string the wires and conductors would be visible and seen against the backdrop of hills.	Moderate-low	Moderate-low

Viewpoint	Visual sensitivity	Timing	Magnitude of change	EIS project visual impact	Amended project visual impact
		Operation	In addition to what was assessed in the EIS, the upper portion of the transmission line structures at the transposition site would be visible rising above the intervening landform, and viewed against the hills, somewhat reducing their prominence in the valley.	Moderate-low	Moderate-low
Viewpoint 6b: View north from Yaven Creek Road	Neighbourhood	Construction	A new construction compound (Ellerslie Road compound (C21)) would be established alongside the new easement, at the corner of Yaven Creek and Ellerslie roads, in the centre of view, surrounding the rural dwelling and outbuildings. The construction activity and presence of a construction compound would detract from the remote rural character of this view.	Not assessed in EIS	Moderate-low
		Operation	Following construction, the construction compound would be removed and there would be a new easement containing transmission line structures, ranging between 50 and 76 m tall, seen in front of and aligned parallel to the existing transmission line easement, in the middle ground of this view. The transmission line structures would be visible crossing the Yaven Creek valley and hills to the east, and there would be a double row of structures at the transposition site, increasing the presence of large-scale infrastructure in this view.	Not assessed in EIS	Moderate-low
Viewpoint 9: View east from The Big Apple, Stewarts Road, Batlow	Local	Construction	The amended project footprint would be relocated about 6.5 km west of this viewpoint, through Green Hills State Forest, and would not be seen in this view.	Low	Negligible
		Operation	The amended project would be located about 6.5 km west of this viewpoint and would not be seen in this view.	Low	Negligible
Viewpoint 13: View south-east from Brungle Road	Local	Construction	In this view, the amended project has moved slightly to the south, on the other side of the low hills. Overall, the construction activity of the amended project would detract from the amenity of the view.	Moderate	Moderate
		Operation	A new transmission line would continue to be seen in the fore and middle ground of this view, crossing over Brungle Road, as described in the EIS. However, east of the road crossing, the amended project would divert to the south, further away than the project as assessed in the EIS, so that the transmission structures would be partially screened by the intervening hills.	Moderate	Moderate-low
Viewpoint 24: View south-west from Grabben Gullen Road	Local	Construction	A transposition site is proposed to the west of Grabben Gullen Road, which would include a double row of transmission line structures.	Moderate-low	Moderate-low
		Operation	The amended project would include a transposition, with views to a double row of transmission line structures for a short section (approximately 360 m) of the new	Moderate-low	Moderate-low

Viewpoint	Visual sensitivity	Timing	Magnitude of change	EIS project visual impact	Amended project visual impact
			easement. This would be seen in the background of this view, partly screened by the undulating landform.		
Views from the air	Regional	Construction	The proposed construction compounds and worker accommodation facilities may be visible from the air but be seen in a vast and highly varied landscape and would somewhat contrast with the surrounding landscape. Overall, during construction there would be less of an impact from the project in areas east of Batlow as the transmission line corridor alignment is shifted west and through the Green Hills and Bago State forests. Note, there would be no visual impact on commercial flights as they are not operated for the purposes of appreciating views and are mostly operating at heights that would limit visibility of the project.	Moderate	Moderate-low
		Operation	The changes to the amended project between Wagga Wagga, Tumut and Bannaby would not appreciably alter the assessment identified in the EIS. The proposed changes to the Gugaa 500 kV substation would be seen within a varied and complex landscape where other transmission and related infrastructure are noticeable and would be largely absorbed into the view. The amended transmission line corridor would, however, remove the project footprint from the more scenic landscapes east of Batlow and introduce a new built feature in Green Hills and Bago State forests.	Moderate-low	Moderate-low

Note: additional images have been included for Viewpoint 3 and Viewpoint 6 where the amended project components would not be adequately covered by the view selected for the EIS.

Table 6-25 Summary of visual impacts for new viewpoints

Viewpoint	Visual sensitivity	Timing	Magnitude of change	Amended project visual impact
Viewpoint 29: View north-east from Mates Gully Road	Neighbourhood	Construction	The construction and operation of Tarcutta accommodation facility and compound (AC03) would be seen in the centre of this view, extending along Mates Gully Road. The facility would be located in the pasture fields in the middle ground of this view, and extending north towards Mates Gully, requiring removal of pastures and trees. The worker accommodation facility and construction compound would be prominent and reduce the amenity of this view.	Moderate-low
		Operation	At the end of construction, the worker accommodation facility and construction compound infrastructure would be removed. The site would be returned to rural use and the rural character of this view would be restored.	Negligible
Viewpoint 30: View south-west from Wondalga Road (north)	Neighbourhood	Construction	The transmission line structures and easement would cross Wondalga Road about 650 m away, in the middle ground of view, and extend through the forested landscape either side of the road. Ardrossan Headquarters Road compound (C17) would be established beside the Ardrossan forestry depot, including site offices, amenities, and construction support facilities. The construction activity would contrast with the undulating forested landscape which does not currently include large-scale transmission infrastructure. However, the forestry landscape is highly modified, so the magnitude of change is not as great as it would be in a rural landscape	Negligible
		Operation	In this view there would be a new cleared easement with some native shrubs alongside the adjacent forestry. This easement would contain several transmission line structures ranging between 50 and 76 m tall. Given that the forestry landscape is highly modified, the magnitude of change would be low.	Negligible
Viewpoint 31a/ 31b: Views from Wondalga Road (south)	Neighbourhood	Construction	The new easement would extend through the recently planted pine plantation forest, with the removal of vegetation and construction of several transmission line structure sites visible. The construction activity would contrast with the undulating forested landscape which does not currently include large-scale transmission infrastructure but be somewhat in character with the scale of equipment used for forestry harvesting and transportation.	Negligible
		Operation	A new cleared easement with native vegetation established adjacent to the forestry would be seen in this view. The easement would be cleared of trees and the forestry uses seen from this location would continue around the new easement.	Negligible

Viewpoint	Visual sensitivity	Timing	Magnitude of change	Amended project visual impact
Viewpoint 32: Views north-west from Green Hills Access Road	Neighbourhood	Construction	The construction and operation of Green Hills accommodation facility and compound (AC07) would be seen in the centre of this view, extending along the western side of Green Hills Access Road. Once installed, the facility would include demountable and modular accommodation unit structures to accommodate staff and other facilities, with vehicles seen accessing the site generally in the mornings and evenings. The construction and operation of the worker accommodation facility would introduce large-scale construction support facilities into an otherwise rural and forested landscape that is currently used for forestry purposes.	Low
		Operation	At the end of construction, the worker accommodation facility and construction compound infrastructure would be removed. The site would be returned to rural use and the character of this view would be restored.	Negligible
Viewpoint 33: View south-west from Batlow Road	Local	Construction	The installation of several transmission line structures would be visible, including vegetation removal alongside Batlow Road, forming a wide cleared corridor through this forested landscape. Overall, this construction activity would be prominent in this view, substantially altering the character of the view.	Moderate-low
		Operation	A new cleared easement would create a wide break in the vegetation along this route. There would be several transmission line structures ranging between 50 and 76 m tall, seen from the road, with wires overhead and extending to the east and west of Batlow Road. The easement would be cleared of trees and the forestry uses seen from this location would continue around the new easement.	Moderate-low
Viewpoint 34: View north from Adjungbilly Road	Neighbourhood	Construction	The construction and operation of Adjungbilly accommodation facility and compound (AC04) would be seen in the centre of this view, extending along the northern side of Adjungbilly Road. The facility and compound would be located in the pasture fields in the middle ground of this view and extending north towards plantation trees seen in the background. The worker accommodation facility and construction compound would be prominent and reduce the amenity of this view.	Moderate-low
		Operation	At the end of construction, the worker accommodation facility and construction compound infrastructure would be removed. The site would be returned to rural use and the rural character of this view would be restored.	Negligible
Viewpoint 35a/ 35b: Views from Faulder Avenue, Yass	Neighbourhood	Construction	The construction and operation of Yass accommodation facility and compound (AC05) would be seen in the centre of these views, extending along Faulder Road. This facility would have similar visual characteristics to the adjacent industrial areas.	Low
		Operation	Once construction is complete, the worker accommodation facility and construction compound infrastructure would be removed. The site would be returned to rural use and the rural character of this view would be restored. The site is adjacent to land that is currently being used for industrial purposes.	Negligible

Viewpoint	Visual sensitivity	Timing	Magnitude of change	Amended project visual impact
Viewpoint 36a/ 36b: View from Woodhouselee Road	Neighbourhood	Construction	The Crookwell accommodation facility and compound (AC06) would be established in the background of view, about 2.5 km to the east. The facility would be screened by intervening landform and out of view.	Negligible
		Operation	Following construction, the worker accommodation facility and construction compound infrastructure would be removed. The site would be returned to rural use and the rural character would be restored. The transmission line structures would be seen in the context of Crookwell 3 wind farm, which includes turbines up to 157 m high, reducing the visual prominence of the new transmission line.	Negligible

6.8.2.3. Night-time visual impact

At night, visual impacts would change in several areas during construction, including in the landscape character zones where worker accommodation facilities have been removed or added to the amended project.

Where impacts have changed from the EIS, the night-time visual impacts during construction of the amended project have been summarised in Table 6-26.

The night-time visual impacts during operation of the amended project are consistent with those described in Chapter 14 (Landscape character and visual amenity) of the EIS. Noting, visual impacts would not occur during operation as the construction compounds and combined worker accommodation facilities and compounds would be removed following construction.

Table 6-26 Summary of night-time visual impacts – amended project – construction

Landscape character area	Landscape character zone	Sensitivity	Magnitude of change	Amended project visual impact
Gregadoo to Book Book rural valleys	Rural Valleys landscape character zone	Moderate	There would also be a new worker accommodation facility (Tarcutta accommodation facility and compound (AC03)) located in this landscape, about 1.5 km south-west of Tarcutta, which would require lighting for 24 hr use. There would be a high magnitude of change in the vicinity of the Tarcutta accommodation facility and compound (AC03) due to the intensity of lighting that would contrast with the scattered lighting within this rural landscape. The area required for the proposed Gugaa 500 kV substation has increased and the Amended Gregadoo Road compound (C06) has extended to the west and north-east (along Livingstone Gully Road), requiring a slightly larger expanse of construction activity, with lighting for operations outside of standard construction hours. There would be a moderate magnitude of change across remaining areas of this character zone.	High-moderate (due to the new Tarcutta accommodation facility (AC03)) Moderate (remaining areas of this character zone)
Adjungbilly rural valleys landscape character area		Moderate	A new worker accommodation facility and compound (Adjungbilly accommodation facility and compound (AC04)) to the north of Adjungbilly Road would require lighting. This lighting would contrast with the surrounding low district brightness.	Moderate
Tumbarumba rural valleys		Moderate	The Tumbarumba accommodation facility (AC1) as outlined in the EIS would not be required in the amended project and the effects of this facility on the landscape character would not occur.	Negligible

Landscape character area	Landscape character zone	Sensitivity	Magnitude of change	Amended project visual impact
Batlow undulating rural hills and ridges landscape character area[1]	Undulating rural hills and ridges landscape character zone	Moderate	A new worker accommodation facility and compound (Green Hills accommodation facility and compound (AC07)) is proposed on the Green Hills Access Road. This facility would introduce brightly lit construction support facilities into an otherwise agricultural landscape. The transmission line corridor has been removed from this landscape and relocated to the west, into Green Hills State Forest. The Amended Memorial Avenue compound (C14) in Batlow remains in the same location as the project described in the EIS, at an existing depot site zoned for industrial uses, and would require lighting. The Bowmans Lane compound (C15) is no longer required for the amended project and has been removed from this landscape. Overall, there would be a negligible magnitude of change at night where the transmission line corridor is no longer passing through this character area, and a high magnitude of change in the vicinity of the construction compound and worker accommodation facility due to the contrast of this brightly lit compound and facility in an area of predominantly low brightness.	High-moderate (combined worker accommodation facility and construction compound only) Negligible (in all other parts of this character area due to the removal of the transmission line corridor)
Black Range to Yass undulating rural hills and ridges landscape character area[1]		Moderate	A new worker accommodation facility and compound (Yass accommodation facility and compound (AC05)) is proposed on the north-western outskirts of Yass, at Faulder Avenue. This facility would be brightly lit but be in an area where there is lighting from scattered residences, industrial uses and major road corridors. The Yass substation compound (C10) on the southern outskirts of Yass remains in the same location as the project described in the EIS and there would be no change to the project footprint in this location.	Moderate
Crookwell rural tablelands landscape character area	Rural tablelands landscape character zone	Local	A new worker accommodation facility and compound (Crookwell accommodation facility and compound (AC06)) is proposed to the east of and set back from Woodhouselee Road. This facility would be brightly lit and likely to contrast with the surrounding area of low district brightness where visible[2].	Moderate

Note:

1. Where the amended project has been relocated, in the vicinity of Batlow and Green Hills, the landscape character areas identified in the EIS have been expanded or divided to reflect this change and more usefully describe the areas of potential impact on landscape character.
2. This facility would occupy the site currently used for construction of the Crookwell 3 Wind Farm.

6.8.2.4. Impact on views from private residences

All dwellings considered in the EIS as well as additional dwellings identified during the submissions phase of the project were assessed or reassessed for the amended project. The detailed assessment of visual impact identified the following visual impacts from private dwellings:

- 21 dwellings would have a high visual impact
- 23 dwellings would have a high-moderate visual impact
- 35 dwellings would have a moderate visual impact.

All remaining dwellings would have a moderate-low, low, or negligible visual impact.

There are no dwellings within the Green Hills section identified as having a moderate or higher visual impact during construction or operation.

These visual impact levels have the potential to be further reduced by mitigation measures, presented in Appendix B (Updated mitigation measures).

Refer to Table 6-27 for a summary of impacts identified in the EIS compared to the amended project.

Generally, the impact levels have reduced. However, several newly built dwellings (or dwellings under construction), and dwellings previously thought to have been sheds, were added to the assessment where there is the potential for visual impacts. There were also several dwellings, assessed in the *Technical Report 8 – Landscape Character and Visual Impact Assessment*, that have been either determined not to be a dwelling or have since been removed. These dwellings have been removed from the assessment.

Table 6-27 Private dwelling visual impacts – comparison between EIS and amended project

Impact level	EIS project – number of dwellings	Amended project – number of dwellings
Low	1	10
Moderate-low	10	10
Moderate	36	35
High-moderate	27	23
High	17	21
Total	**91**	**96**

Of those dwellings with a moderate, high-moderate or high visual impact, four are located on properties that are outside the amended project footprint (ie the project would not be located on the property). Of these dwellings:

- one dwelling would have a high-moderate visual impact
- three dwellings would have a moderate visual impact.

Refer to Table 6-28 for a comparison of impacted dwellings between the EIS and amended project. These impacted dwellings spread throughout the amended project footprint.

Table 6-28 Private dwellings located on property outside the amended project footprint – view impact comparison between EIS and amended project

Impact level	EIS project – number of dwellings	Amended project – number of dwellings
Negligible	1	1
Low	1	6
Moderate-low	2	2
Moderate	5	3
High-moderate	5	1
High	0	0
Total	**14**	**13**

6.8.3. Updated mitigation measures

The approach to avoidance/minimisation and management of landscape character and visual amenity impacts remains consistent with the description provided in Chapter 14 (Landscape character and visual amenity) of the EIS. A minor correction has been made to LV2 regarding project terms, LV3 has been updated to account for the multiple worker accommodation facilities in the amended project, and LV5 has been revised to also apply during construction. New mitigation measure LV7 has been added in relation to pre-dulling the transmission line structures, and new mitigation measure LV8 has been added in relation to visual changes near residences. The updates are shown in **green** and ~~**strikethrough**~~ in Table 6-29. The consolidated list of mitigation measures for the amended project is provided in Appendix B (Updated mitigation measures).

Table 6-29 Summary of revised and new landscape character and visual amenity mitigation measures

Reference	Impact	Mitigation measures	Timing	Relevant location
LV2	Vegetation retention	Temporary and permanent access **tracks** ~~**would**~~ **will** be designed to minimise vegetation removal, changes to landform, and visual impacts where practicable.	Detailed design	All locations
LV3	Construction lighting	Lighting at construction compounds and worker accommodation ~~**facility would**~~ **facilities will** be designed and operated in accordance with *AS 4282 2019 Control of the obtrusive effects of outdoor lighting*.	Detailed design and construction	Construction compounds and worker accommodation ~~**facility**~~ **facilities**
LV5	Visual changes near residences	For residences where the project is predicted to have a moderate to high visual impact, opportunities for screening vegetation ~~**would**~~ **will** be investigated. Appropriate visual screening or other options (for example planting of vegetation) ~~**would**~~ **will** be confirmed in consultation with the affected landowner and implemented where practicable. Vegetative screening would be maintained by the landowner.	Detailed design, **construction** and operation	Transmission line
LV7	**Dulling of transmission line structures**	**Transmission line structures will have a pre-dulled steel finish to minimise the potential for glare and reflection.**	**Detailed design and operation**	**All transmission line structures**
LV8	**Visual changes near residences**	**Transgrid will continue to work with landowners and neighbours to avoid, minimise and mitigate impacts, as well as advocate strongly for a consistent, fair, NSW Government policy on visual impacts to neighbouring properties.**	**Detailed design, construction and operation**	**Transmission line**

6.9. Noise and vibration

6.9.1. Approach to assessment

Technical Report 9 – Noise and Vibration Impact Assessment Addendum has been prepared to consider the potential noise and vibration impacts from the proposed amendments and refinements to the project. There has been no change to the legislative and policy context presented in *Technical Report 9 – Noise and Vibration Impact Assessment* prepared for the EIS.

The assessment of the amendments and refinements has been prepared generally in accordance with the assessment methodology outlined within *Technical Report 9 – Noise and Vibration Impact Assessment* prepared for the EIS.

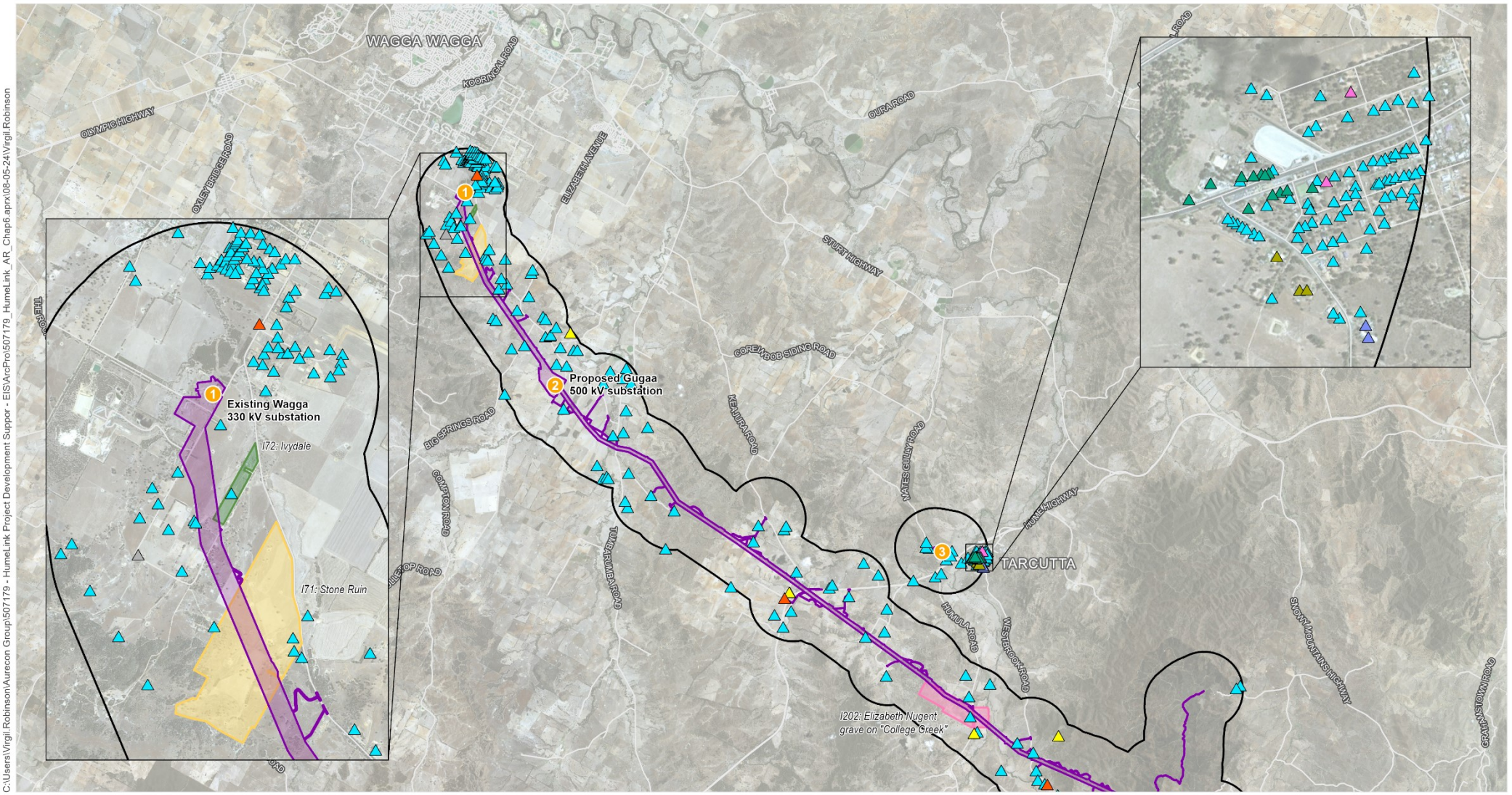
The preparation of *Technical Report 9 – Noise and Vibration Impact Assessment Addendum* involved:

- defining an updated noise and vibration study area to reflect the amended project footprint
- identification of additional sensitive receivers within a two kilometre buffer of the amended project footprint
- unattended ambient noise monitoring in October 2023 within the amended project footprint
- supplementing the construction assessment in the EIS to include:
    - new and updated construction scenarios including in response to:
        > new and amended construction compounds and worker accommodation facilities
        > additional telecommunications connections to existing substations
        > crushing of rock in areas where controlled blasting is expected to be undertaken
        > nomination of additional new and upgraded access tracks
        > revised construction plant and equipment requirements for some scenarios
- a more detailed assessment of potential controlled blasting at nominated areas within the amended project footprint including indicative maximum instantaneous charge (MIC) calculations for each potential controlled blasting area to identify limits for compliance at the nearest sensitive receiver
- additional qualitative assessment of potential aircraft noise associated with the operation of helipads at construction compounds and helicopter and drone use for transmission line stringing
- revising the operational transmission line noise assessment for the amended project, which supersedes the assessment presented in the EIS and considers the changes to the transmission line corridor and the energisation of the line between the existing Wagga 330 kV substation and the proposed Gugaa 500 kV substation at 500 kV.

The representative ‘scenarios’ presented cover a range of noise-producing activities, including highly noise intensive equipment, and are considered representative of the worst-case construction noise which may be experienced at nearby sensitive receivers.

Attachment B in *Technical Report 9 – Noise and Vibration Impact Assessment Addendum* highlights sensitive receivers that have been newly identified for the assessment of the amended project relative to the assessment of the EIS project. *Technical Report 9 – Noise and Vibration Impact Assessment Addendum* also provides further detail on the assumptions adopted in the consideration of additional or updated sensitive receivers for the amended project.

The amended noise and vibration study area with additional sensitive receivers and ambient noise monitoring locations, is shown in Figure 6-6.



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Amended project footprint

Amended noise and vibration study area

Waterway

Heritage listed item

I71: Stone Ruin

I72: Ivydale

I202: Elizabeth Nugent grave on "College Creek"

Sensitive receiver within 2km buffer

Commercial

Dilapidated dwelling

Education facility

Firestation - Bush

Hotel

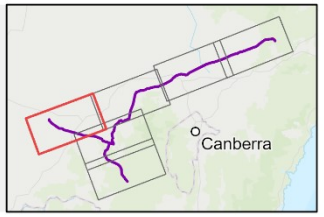
Possible residence

Place of Worship

Residential

Construction ancillary facilities

1. Wagga 330 kV substation compound (C01)
2. Amended Gregadoo Road compound (C06)
3. Tarcutta accommodation facility and compound (AC03)



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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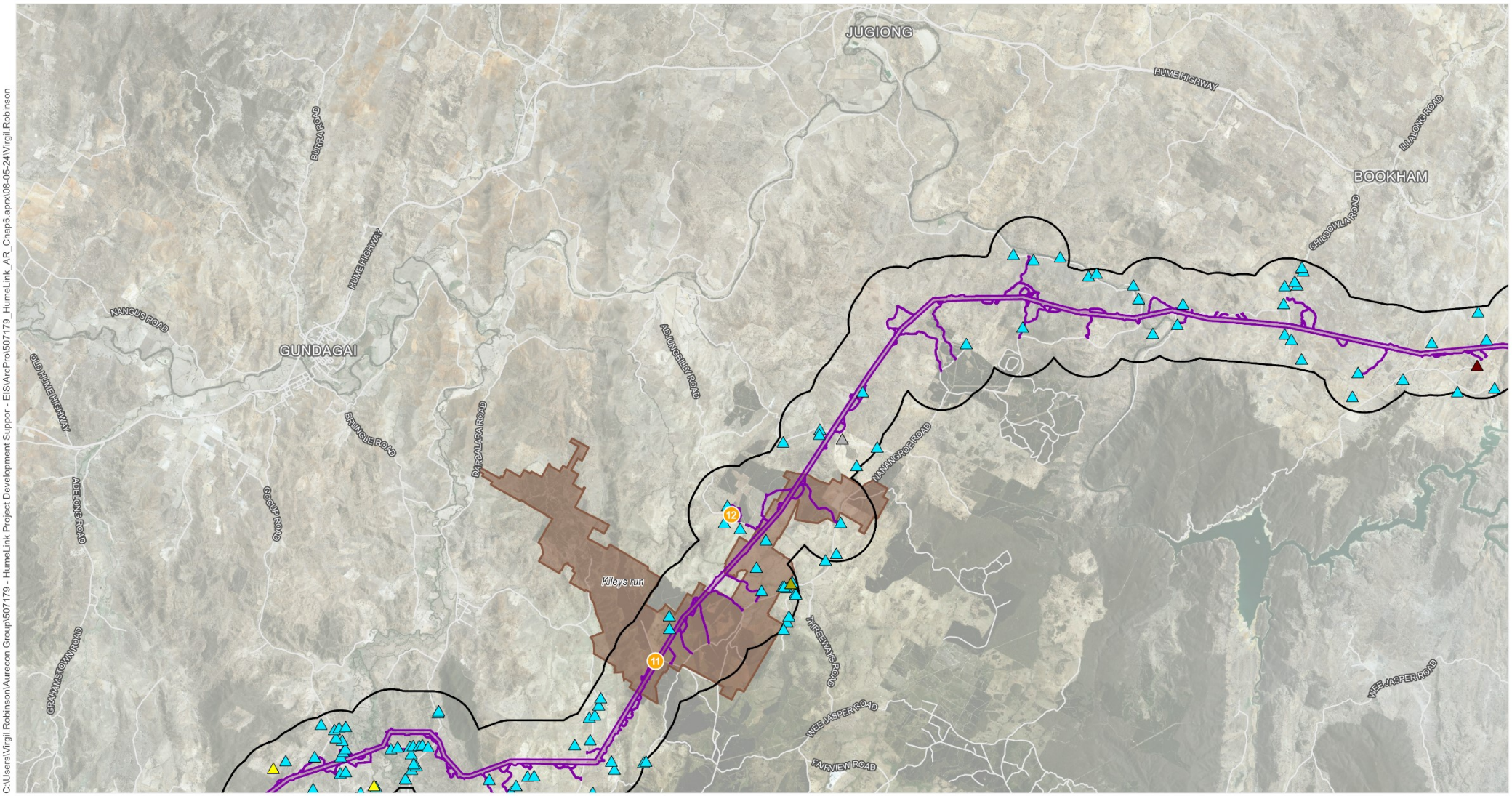
0 5 10km

Projection: GDA 1994 MGA Zone 55

HumeLink

Figure 6-6a: Amended noise and vibration study area



Amended project footprint

Amended noise and vibration study area

Waterway

Heritage listed item

Kileys Run

Sensitive receiver within 2km buffer

Camping Ground

Dilapidated dwelling

Education facility

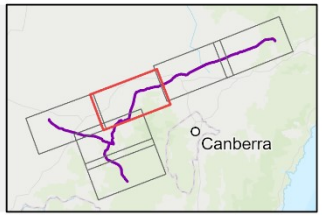
Possible residence

Residential

Construction ancillary facilities

11 Amended Honeysuckle Road compound (C07)

12 Adjungbilly accommodation facility and compound (AC04)



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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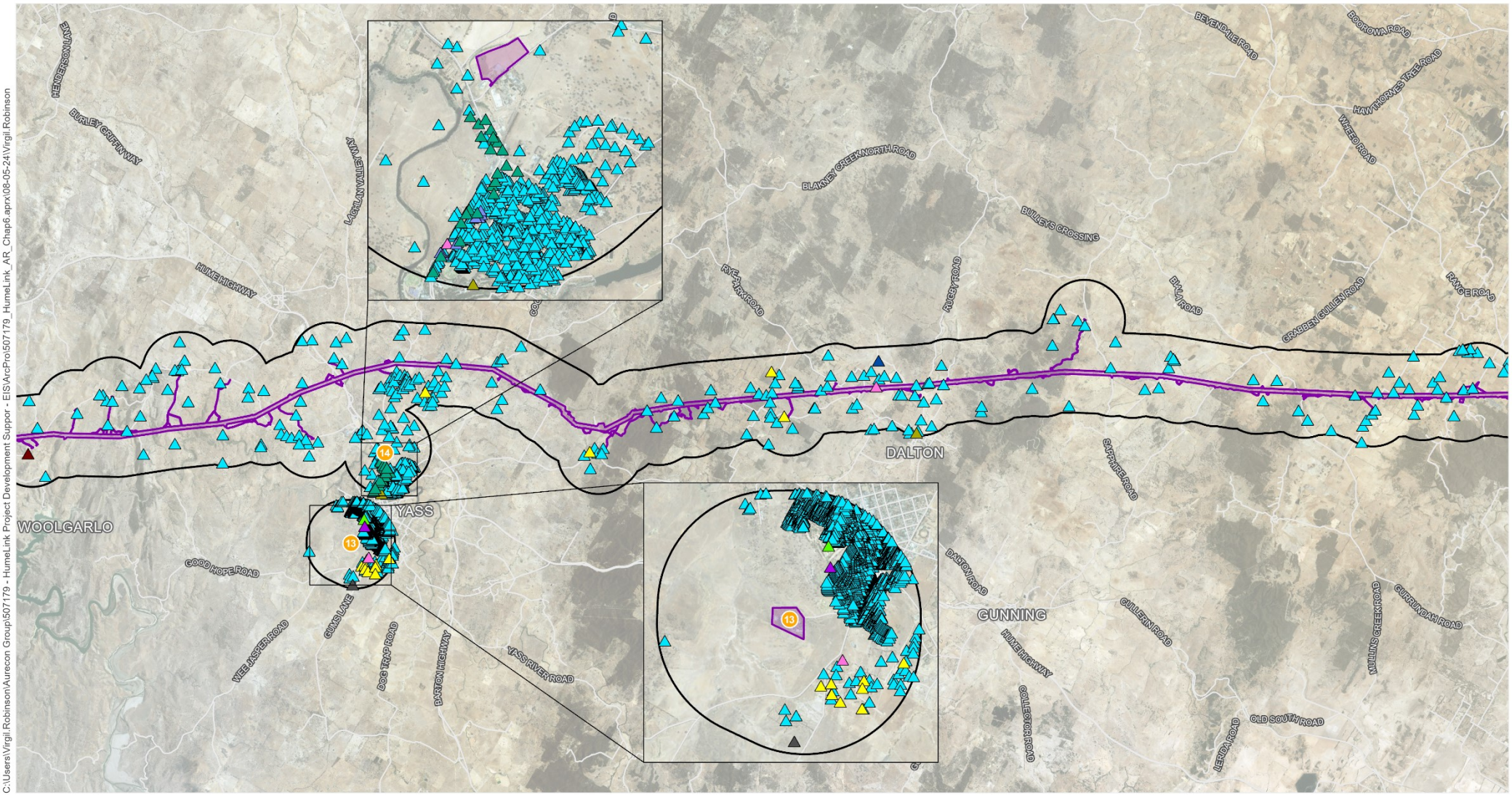
Figure 6-6b: Amended noise and vibration study area



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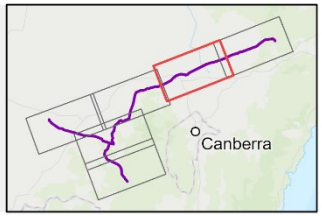
Amended project footprint
Amended noise and vibration study area
Waterway

Sensitive receiver within 2km buffer

Camping Ground
Commercial
Club
Education facility
Gas Facility
Golf Course
Hotel
Possible residence
Place of Worship
Racecourse
Residential

Construction ancillary facilities

13 Yass substation compound (C10)
14 Yass accommodation facility and compound (AC05)



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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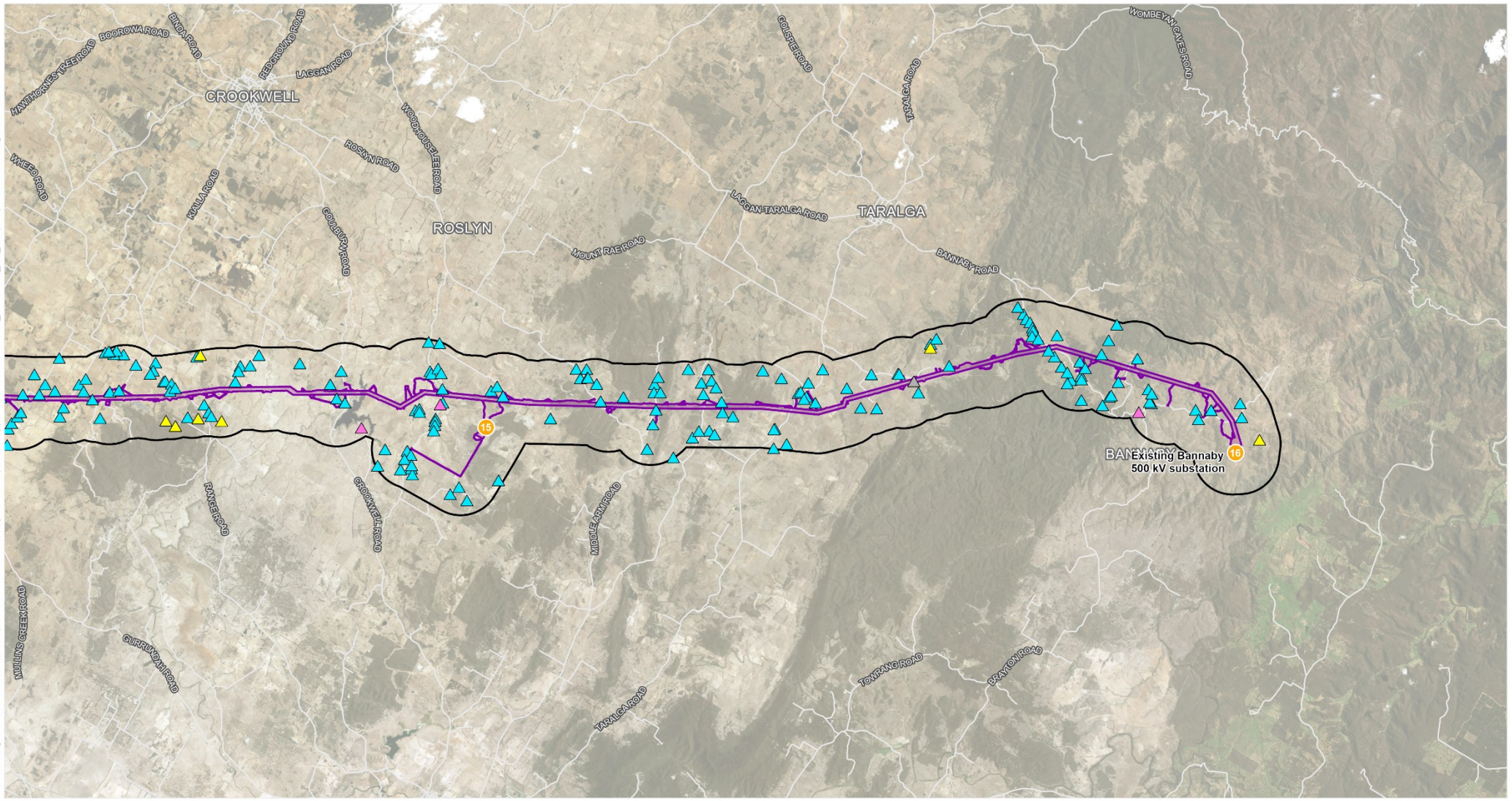
Projection: GDA 1994 MGA Zone 55

HumeLink

Figure 6-6c: Amended noise and vibration study area



Amended project footprint

Amended noise and vibration study area

Waterway

Sensitive receiver within 2km buffer

Dilapidated dwelling

Possible residence

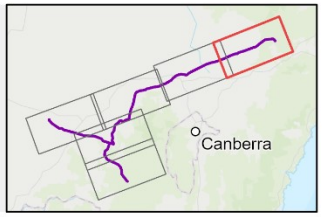
Place of Worship

Residential

Construction ancillary facilities

15 Crookwell accommodation facility and compound (AC06)

16 Amended Bannaby 500 kV substation compound (C12)



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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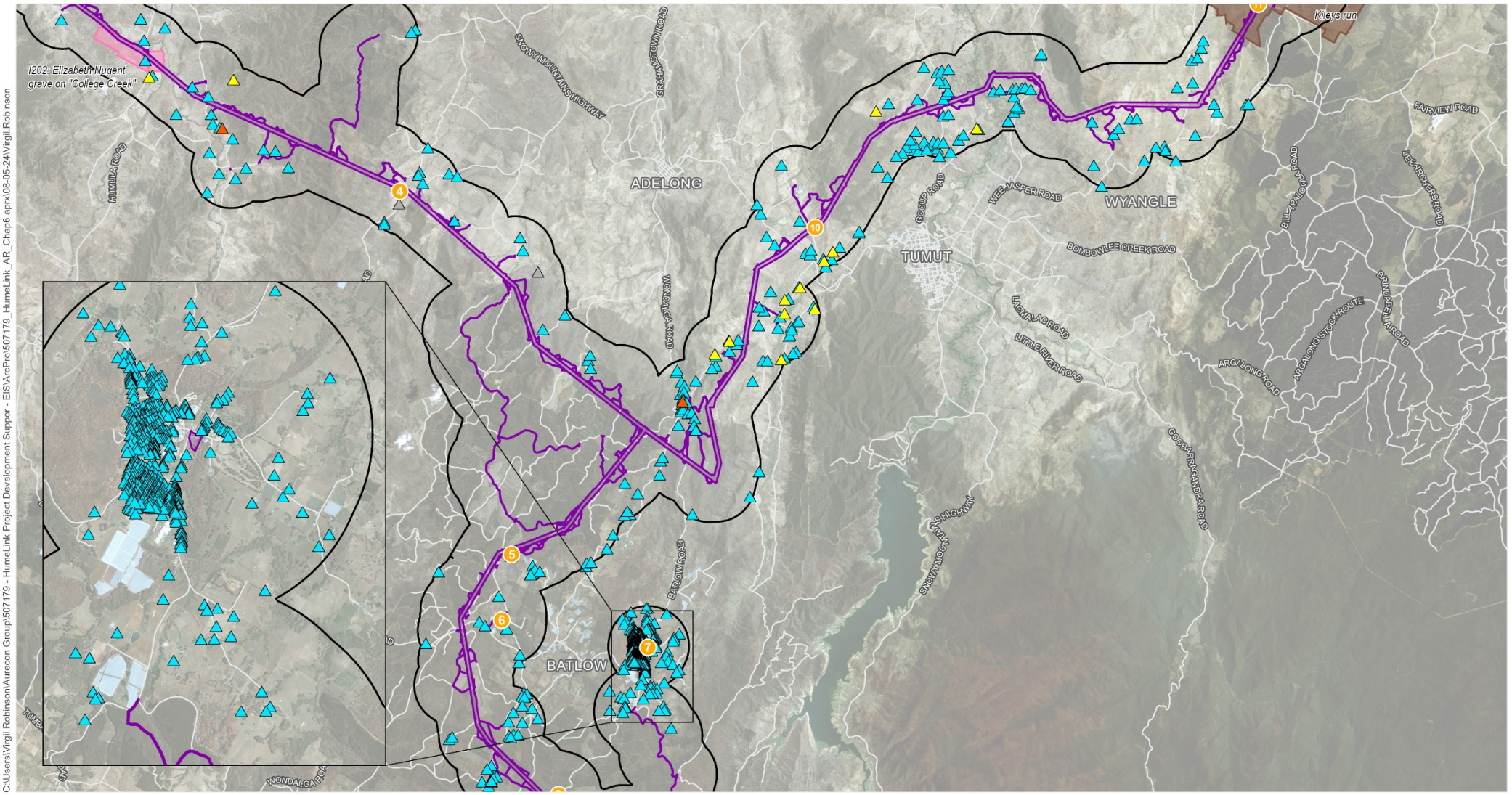
0 5 10 km

Projection: GDA 1994 MGA Zone 55

HumeLink

Figure 6-6d: Amended noise and vibration study area



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Amended project footprint

Amended noise and vibration study area

Waterway

Heritage listed item

Kileys Run

I202: Elizabeth Nugent grave on "College Creek"

Sensitive receiver within 2km buffer

Dilapidated dwelling

Firestation - Bush

Possible residence

Residential

Construction ancillary facilities

4 Ellerslie Road compound (C21)

5 Ardrossan Headquarters Road compound (C17)

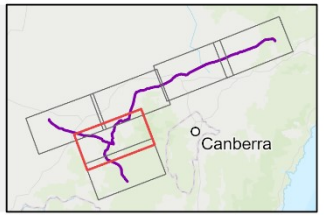
6 Green Hills accommodation facility and compound (AC07)

7 Amended Memorial Avenue compound (C14)

8 Snubba Road compound (C18)

10 Gadara Road compound (C19)

11 Amended Honeysuckle Road compound (C07)



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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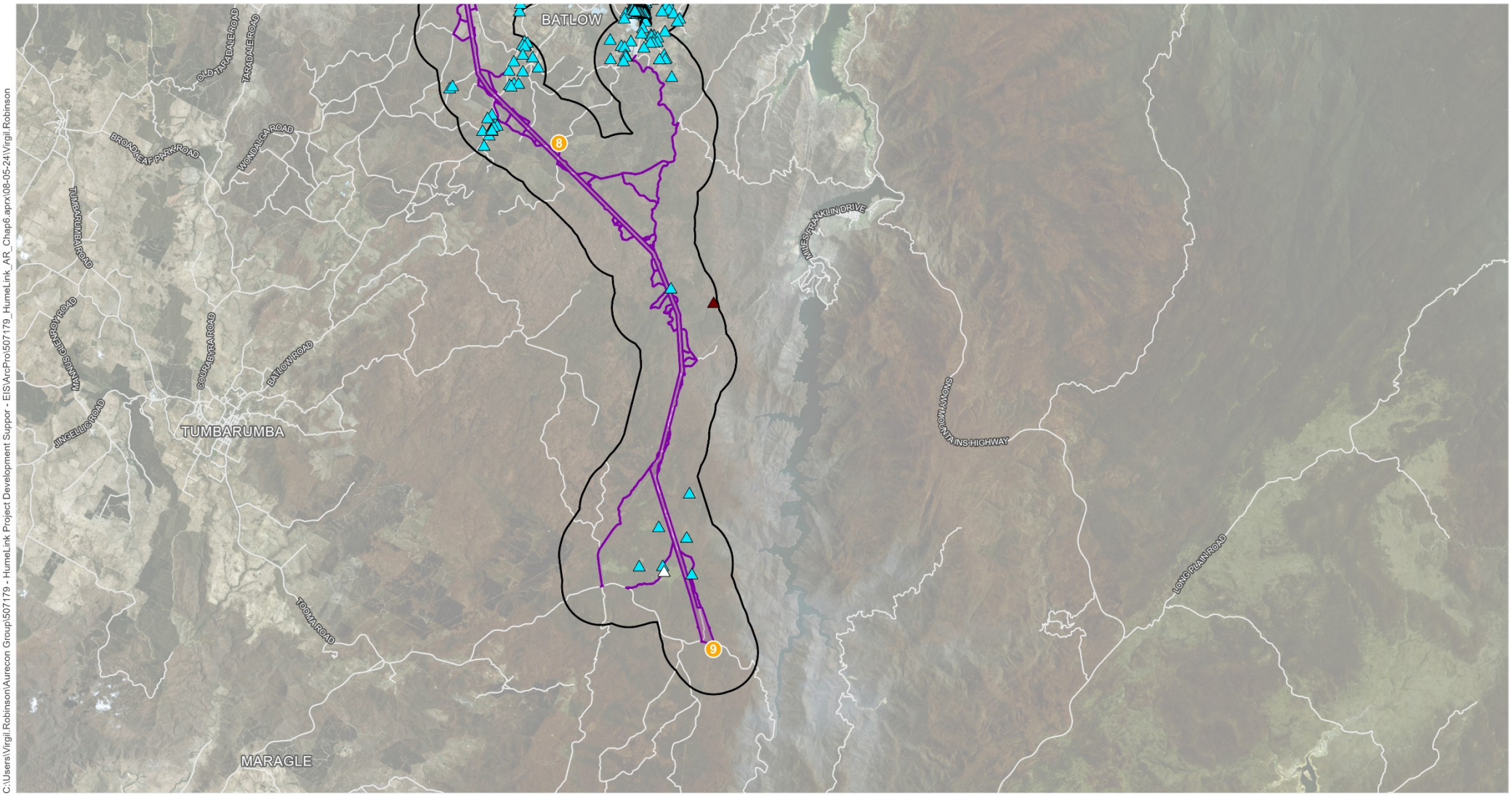
Projection: GDA 1994 MGA Zone 55

HumeLink

Figure 6-6e: Amended noise and vibration study area



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Amended project footprint

Amended noise and vibration study area

Waterway

Sensitive receiver within 2km buffer

Camping Ground

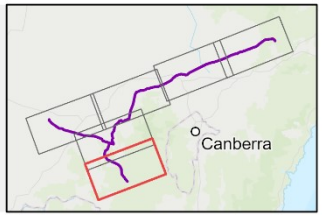
Residential

Tourist Park / Home Village

Construction ancillary facilities

8 Snubba Road compound (C18)

9 Maragle 500 kV substation compound (C05)



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:200,000

0 5 10km

Projection: GDA 1994 MGA Zone 55

HumeLink

Figure 6-6f: Amended noise and vibration study area

All noise monitoring locations (including those used for EIS project and new locations for the amended project) are summarised in Table 6-30 with the additional monitoring locations for the amended project shown in **bold** text. Monitoring locations L03 and L09 have been removed, due to the removal of the Snowy Mountains Highway compound (C02) and the Tumbarumba accommodation facility (AC1) from the amended project.

Table 6-30 Noise monitoring locations and background noise results

Location ID	Address	Noise level (dBA)[1,2]					
		Background noise (RBL)			Average noise (L_{Aeq})		
		Day	Evening	Night	Day	Evening	Night
L01[3]	83 Ashfords Road, Wagga Wagga	31	29	26	46	43	38
L02	1070 Livingstone Gully Road, Gregadoo	29	<25	<25	52	41	42
L04[4]	1428 Adjungbilly Road, Adjungbilly	39	39[5] (47)	38	53	57	51
L05	Hanworth Road, Bannaby	26	26[5] (27)	<25	44	39	46
L06	14 Memorial Avenue, Batlow	35	35	32	60	53	49
L07	Bowmans Lane, Batlow	29	29[5] (30)	29[5] (30)	46	43	43
L08	Perry Street, Yass	38	38[5] (42)	34	56	58	52
L10	**Mates Gully Road, Tarcutta**	**39**	**39[5] (41)**	**39**	**50**	**51**	**50**
L11	**Sydney Street, Tarcutta**	**42**	**42[5] (44)**	**42[5] (44)**	**55**	**55**	**55**
L12	**Faulder Avenue, Yass**	**37**	**37[5] (41)**	**37**	**50**	**51**	**51**
L13	**Wargeila Road, Yass**	**36**	**36[5] (38)**	**34**	**46**	**47**	**46**

Note:

1. The Rating Background Level (RBL) and L_{Aeq} noise levels have been determined with reference to the procedures in the Noise Policy for Industry (Npfl) (EPA, 2017).
2. Day-time is 7am to 6pm, evening is 6pm to 10pm and night-time is 10pm to 7am.
3. Data taken from *EnergyConnect (NSW – Eastern Section) Environmental Impact Statement*, conducted in 2020 (Transgrid, 2020).
4. The ambient noise environment at this location was found to be influenced by extraneous noise (likely mechanical plant/equipment in the vicinity of the monitor) and is not considered representative of the surrounding area.
5. The monitored evening or night level was found to be higher than the day-time. In this situation the Npfl requires that the evening or night level be reduced to match the day-time level. The monitored level is shown in brackets.

6.9.2. Assessment of amendments and refinements

6.9.2.1. Construction impacts

Construction noise impacts from ancillary facilities

Several ancillary facilities proposed in the EIS are no longer required for the amended project. Therefore, any construction noise impacts described in the EIS from the site establishment or operation of these ancillary facilities are no longer expected to eventuate. This includes the previously proposed Snowy Mountains Highway compound (C02), Snubba Road compound (C03), Red Hill Road compound (C08), Adjungbilly Road compound (C09), Woodhouselee Road compound (C11), Bowmans Lane compound (C15), Snubba Road compound (C16) and Tumbarumba accommodation facility (AC01).

An additional assessment was undertaken for all new or amended ancillary facilities proposed in the amended project except for the following which are at a sufficient distance from sensitive receivers such that construction noise impacts are not expected:

- Amended Bannaby 500 kV substation compound (C12)
- Amended Honeysuckle Road compound (C07)
- Snubba Road compound (C18)
- Crookwell accommodation facility and compound (AC06).

Day-time impacts

The number of residential receivers where noise management level (NML) exceedances are predicted for amended construction compounds and worker accommodation facilities is summarised in Table 6-31 and Table 6-32.

Table 6-31 Day-time NML exceedances

Scenario	Duration[1]	Number of sensitive residential receivers			
		HNA[2]	With NML exceedance[3]		
			1-10 dB Clearly audible	11-20 dB Moderately intrusive	>20 dB Highly intrusive
Amended Gregadoo Road compound (C06)					
Site establishment	3-4 weeks	-	3	-	-
Compound operation	Construction duration	-	1	-	-
Amended Memorial Avenue compound (C14)					
Site establishment	3-4 weeks	1	446	84	6
Compound operation	Construction duration	1	347	19	4
Ardrossan Headquarters Road compound (C17)					
Site establishment	3-4 weeks	1	-	-	1
Compound operation	Construction duration	-	-	-	1
Gadara Road compound (C19)					
Site establishment	3-4 weeks	-	2	-	-
Compound operation	Construction duration	-	-	-	-
Ellerslie Road compound (C21)					
Site establishment	3-4 weeks	-	1	-	-
Compound operation	Construction duration	-	-	-	-
Tarcutta accommodation facility and compound (AC03)					
Site establishment	8-12 weeks	-	3	3	-
Compound operation	Construction duration		5	-	-
Accommodation facility operation	Construction duration	-	-	-	-
Adjungbilly accommodation facility and compound (AC04)					
Site establishment	8-12 weeks	-	2	1	-
Compound operation	Construction duration		2	1	-

Scenario	Duration[1]	Number of sensitive residential receivers			
		HNA[2]	With NML exceedance[3]		
			1-10 dB Clearly audible	11-20 dB Moderately intrusive	>20 dB Highly intrusive
Accommodation facility operation	Construction duration	-	1	-	-
Yass accommodation facility and compound (AC05)					
Site establishment	8-12 weeks	-	59	5	1
Compound operation	Construction duration		12	2	-
Accommodation facility operation	Construction duration	-	2	-	-
Green Hills accommodation facility and compound (AC07)					
Site establishment	8-12 weeks	-	3	-	1
Compound operation	Construction duration		1	1	
Accommodation facility operation	Construction duration	-	1	-	-

Note:

1. Durations should be regarded as indicative and representative of a typical work site.
2. Highly Noise Affected (HNA), based on the Interim Construction Noise Guideline (ICNG) definition (ie predicted L_{Aeq} (15minute) noise at residential receiver is 75 decibel A- weighted (dBA) or greater) (DECC, 2009).
3. Based on worst-case predicted noise levels.

Overall, Table 6-31 shows the predicted noise impacts during the day-time to be generally limited to a few residential receivers closest to each temporary ancillary facility, with the exception of the Yass accommodation facility and compound (AC05) and the Amended Memorial Avenue compound (C14). Noting, site establishment work would be limited to a duration of approximately three to four weeks per standalone construction compound and eight to 12 weeks for combined accommodation facilities and construction compounds, this impact is considered temporary and minor.

Table 6-31 indicates 'highly intrusive' (exceedance greater than 20 decibels (dB)) worst-case day-time impacts are predicted during site establishment at up to six residential receivers closest to the Amended Memorial Avenue compound (C14) and one residential receiver closest to each of the following; Ardrossan Headquarters Road compound (C17), Yass accommodation facility and compound (AC05) and Green Hills accommodation facility and compound (AC07). This is primarily due to the proximity of the receivers, which are generally within 100 metres of the facilities, and the low existing background noise levels.

A comparison of the total number of residential receivers with day-time NML exceedances from ancillary facilities for the amended project compared to the EIS project, shows:

- 42 fewer residential receivers are predicted to exceed the day-time NMLs during 'site establishment'
- nine additional residential receivers are predicted to exceed the day-time NMLs during 'compound operation'
- most of the ancillary facility construction noise impacts are predicted at the Amended Memorial Avenue compound (C14) due to proximity to sensitive receivers, which is generally consistent between the amended project and the EIS project.

Night-time impacts

The combined worker accommodation facilities and construction compounds would operate as worker accommodation facilities during all hours for the duration of the amended project construction. As outlined in Table 6-32, predicted worst-case night-time impacts from 'worker accommodation facility operation' include:

- 'Moderately intrusive' (16 to 25 decibels) at one residential receiver closest to the Green Hills accommodation facility and compound (AC07)
- 'Clearly audible' (6 to 15 decibels) at up to four of the residential receivers closest to the Yass accommodation facility and compound (AC05) and one residential receiver closest to the Adjungbilly accommodation facility and compound (AC03)
- 'Noticeable' (one to five decibels) at the three residential receivers closest to the Tarcutta accommodation facility and compound (AC03).

In addition, exceedances of up to five dBA of the sleep disturbance screening criteria is predicted at up to eight residential receivers near; Tarcutta accommodation facility and compound (AC03), Adjungbilly accommodation facility and compound (AC04) and Yass accommodation facility and compound (AC05). An exceedance of between six to 12 dBA is predicted at four residential receivers closest to Tarcutta accommodation facility and compound (AC03), Yass accommodation facility and compound (AC05) and Green Hills accommodation facility and compound (AC07).

Table 6-32 Out-of-hours NML exceedances – worker accommodation facility operation

Location	HNA[2]	Number of residential receivers															
		With NML exceedance[3]												Sleep disturbance			
		Day-time OOH[4]				Evening				Night-time							
		1-5 dB	6-15 dB	16-25 dB	>25 dB	1-5 dB	6-15 dB	16-25 dB	>25 dB	1-5 dB	6-15 dB	16-25 dB	>25 dB	1-5 dB	6-15 dB	16-25 dB	>25 dB
Tarcutta accommodation facility and compound (AC03)	-	-	-	-	-	-	-	-	-	3	-	-	-	3	1	-	-
Adjungbilly accommodation facility and compound (AC04)	-	-	1	-	-	2	1	-	-	2	1	-	-	1	-	-	-
Yass accommodation facility and compound (AC05)	-	4	2	-	-	4	2	-	-	4	4	-	-	4	2	-	-
Green Hills accommodation facility and compound (AC07)	-	-	1	-	-	1	-	1	-	1	-	1	-	-	1	-	-

Note:

1. Durations should be regarded as indicative and representative of a typical work site.
2. Highly Noise Affected (HNA), based on ICNG definition (ie predicted LAeq (15minute) noise at residential receiver is 75 dBA or greater).
3. Based on worst-case predicted noise levels.as the calculations assume several items of construction plant and equipment are in use at the same time and work occurs at the boundary that is the closest point to each receiver.
4. OOH = Out-of-hours. During the day-time, Saturday between 7am to 8am, and 1pm to 10pm, Sunday and public holidays between 8am to 6pm. Evening out-of-hours, Monday to Saturday between 6pm to 10pm. Night-time, Monday to Saturday 10pm to 7am, or Sunday and public holidays between 6pm to 8am.

Construction noise impacts from transmission lines and associated construction activities

As with the EIS, transmission line construction is generally predicted to have high noise impacts but the impacts are only expected when work is taking place at the transmission line structures closest to each sensitive receiver, which would be relatively short-term.

A summary of the number of residential receivers where NML exceedances are predicted for construction of the Green Hills corridor amendment, the additional telecommunication connections, crushing and access track work is shown in Table 6-33.

Table 6-33 Day-time NML exceedances

Scenario	Duration[1]	Number of residential receivers			
		HNA[2]	With NML exceedance[3]		
			1-10 dB Clearly audible	11-20 dB Moderately intrusive	>20 dB Highly intrusive
Green Hills corridor amendment construction					
Site establishment and deliveries	1-3 weeks per transmission line structure	-	7	1	-
Earthwork and clearing	1-5 days per transmission line structure	-	15	1	-
Construction of structures	2 weeks per transmission line structure	-	1	-	-
Overhead stringing of conductors and earth wires	3 weeks per stringing work site	-	1	-	-
Decommissioning and rehabilitation	2-3 days per transmission line structure	-	-	1	-
Telecommunications connections					
Gadara 132 kV substation	2 months per location	-	1	-	-
Gullen Range 330 kV substation		-	2	-	-
Crookwell 2 330 kV substation		-	-	-	-
Crushing					
Crushing	1 month per controlled blasting area location (refer to Chapter 3 (Description of the amended project) for the 21 potential blasting areas identified)	-	66	13	1
Access tracks work					
Access tracks – New	1-2 days per track	2	260	90	21
Access tracks – Upgrade		24	184	57	45
Intersections		1	179	52	6

Note:

1. Durations should be regarded as indicative and representative of a typical work site.
2. Highly Noise Affected (HNA), based on ICNG definition (ie predicted L_{Aeq} (15minute) noise at residential receiver is 75 dBA or greater).
3. Based on worst-case predicted noise levels.

The total number of residential receivers predicted to have transmission line construction noise impacts is similar between the EIS project and the amended project. Comparison of the total number of residential receivers with day-time NML exceedances from the transmission line construction scenarios shows:

- additional exceedances of the day-time NMLs during ‘site establishment and deliveries’ (six additional residential receivers) and ‘earthwork and clearing’ (17 additional residential receivers)
- fewer exceedances of the day-time NMLs during ‘construction of structures’ (three residential receivers), ‘overhead stringing of conductors and earth wires’ (two residential receivers) and ‘decommissioning and rehabilitation’ (six residential receivers).

The amended transmission corridor through the Green Hills State Forest is relatively distant from densely populated areas and is predicted to impact 12 fewer residential receivers between Wondalga and Buddong, where the transmission line corridor has been removed relative to the EIS project. Construction of the Green Hills corridor amendment would be clearly audible for up to 15 residential receivers, ‘moderately intrusive’ at the closest residential receiver with no residential receivers predicted to be highly noise affected from transmission line construction in this area based on a worst-case noise impact assessment. Other corridor realignments are predicted to result in one additional residential receiver being impacted at the location near Kyeamba Creek and Tumbarumba Road, Book Book and reduced impacts at four to eight residential receivers, depending on the work scenario, surrounding the narrowing of the project footprint at Wondalga, Gobarralong and Bowning.

‘Clearly audible’ worst-case impacts are predicted for the residential receiver closest to the Gadara 132 kV substation telecommunications connection and two residential receivers closest to Gullen Range 330 kV substation telecommunications connection.

Controlled blasting may be required in specific locations in up to 21 areas (refer to Chapter 3 (Description of the amended project)). Short-term noise from controlled blasting occurring would be momentarily audible in these areas and sound similar to a gunshot or firework, which may cause temporary disturbance to nearby sensitive receivers.

Crushing activities (required as a result of controlled blasting) are predicted to be ‘clearly audible’ at 66 residential receivers near the potential controlled blasting areas, ‘moderately intrusive’ impacts are predicted at up to 13 residential receivers and a ‘highly intrusive’ noise impact is predicted at one residential receiver closest (about 80 metres) to a potential controlled blasting area during crushing activities. Crushing is expected for a duration of up to around one month per potential controlled blasting area.

Access track work is predicted to impact up to 474 sensitive receivers across the amended project footprint. ‘Highly intrusive’ worst-case day-time noise impacts are predicted at up to 66 residential receivers closest to proposed new and upgraded access tracks and at up to six residential receivers closest to potential intersection upgrades.

One other sensitive receiver (place of worship, Greendale Uniting Church, Broadway), is predicted to have a ‘clearly audible’ noise impact during construction of the closest access track.

However, overall access track work would be relatively short-term and is only expected to impact individual sensitive receivers for a few days.

As discussed in Section 6.9.3, the construction noise mitigation approach would be consistent with *Technical Report 9 – Noise and Vibration Impact Assessment* prepared for the EIS and include the

preparation of a Noise and Vibration Management Plan (NVMP) to provide the framework and mechanisms for the management of construction noise impacts from the project.

Construction road traffic noise impacts

As a result of the amendments and refinements to the project, updated construction traffic volumes have been reassessed for all proposed construction traffic access routes. The road traffic noise assessment against the *NSW Road Noise Policy* (RNP) (DECCW, 2011) criteria identified construction traffic is likely to result in a noticeable increase in noise levels (greater than two decibels) for sensitive receivers on all local roads and around 25 per cent of the arterial/sub-arterial roads. This is largely due to low existing traffic volumes on the routes.

Exceedances of the RNP criteria are predicted for:

- local unsealed roads:
  - receivers within 100 metres of the road edge of all indicative construction access routes
  - receivers within 250 metres of the road edge for seven local unsealed roads
- local sealed roads:
  - receivers within 10 metres of the road edge of all the indicative construction access routes
  - receivers within 100 metres from the road edge of 25 local sealed roads.

The assessment above is based on the worst-case scenario, which assumes the peak construction workforce is travelling in the night-time period (ie travelling before 7am for a 7am start time on site). However, it is likely that there would be times during construction when fewer vehicle movements are required and/or the maximum vehicle movements occur during the day-time period, resulting in lower road traffic noise impacts than those predicted in the worst-case scenario. Where predicted impacts do occur, it is anticipated that mitigation measure NV6, which provides measures to be implemented for construction vehicle movements, would minimise and/or manage impacts on sensitive receivers.

Construction vibration impacts

The aspects of the amended project that have been considered in relation to potential construction vibration include:

- transmission line corridor amendments and refinements, including the Green Hills corridor amendment
- changes to construction compounds and worker accommodation facilities
- controlled blasting and crushing areas within the amended project footprint
- new and upgraded access tracks/roads
- telecommunications connections.

The assessment methodology is consistent with the EIS and the required offset distances for vibration intensive equipment during construction have been determined from the *Construction Noise and Vibration Guidelines* (CNVG) (Transport for NSW, 2023) recommended minimum working distances for cosmetic damage and human response.

The assessment predictions represent a worst-case situation where a large vibratory roller is in use at the boundary of the amended project footprint. The number of receivers located less than the minimum working distance (eg less than 100 metres from the potential location of a large vibratory roller) likely to experience ‘human comfort’ level impacts is 67 receivers. The assessment also shows that 27 sensitive receivers

closest to transmission line construction (ie less than 20 metres from large vibratory roller) are likely to be within the minimum working distance for cosmetic damage.

Several potential controlled blasting areas have been identified for the amended project. Indicative limits of MIC have been determined for each potential controlled blasting area, which would allow the recommended ground vibration and overpressure limits to be met (refer to Table 6-34). The indicative MIC values are calculated conservatively as they assume that controlled blasting may occur up to the edge of each potential controlled blasting area. Furthermore, controlled blasting would be limited to specific locations within the areas and may not occur if it is not determined to be the preferred construction method in an area.

Table 6-34 Summary of MIC limits for potential controlled blasting areas

Potential controlled blasting area	Locality	Distance to closest residential dwelling	MIC Limit Site Constant (Ka = 100)	MIC Limit Site Constant (Ka = 10)
1	Oberne Creek	449 m	<1 kg	72 kg
2	Oberne Creek	783 m	3.2 kg	381 kg
3	Green Hills State Forest	497 m	<1 kg	97 kg
4	Bago State Forest	78 m	<1 kg	<1 kg
5	Gadara Park	1,061 m	8.1 kg	946 kg
6	Minjary National Park	839 m	4.0 kg	468 kg
7	Wyangle	581 m	1.3 kg	155 kg
8	Brungle	1,235 m	12.7 kg	1,493 kg
9	Gobarralong	905 m	5.0 kg	586 kg
10	Bookham	389 m	<1 kg	46 kg
11	Bookham	537 m	1.0 kg	123 kg
12	Bookham	152 m	24.0 kg	2,814 kg
13	Woolgarlo	719 m	2.5 kg	294 kg
14	Woolgarlo	781 m	3.2 kg	377 kg
15	Bango	732 m	2.6 kg	310 kg
16	Bango	413 m	<1 kg	56 kg
17	Pejar	801 m	3.5 kg	408 kg
18	Myrtleville	266 m	<1 kg	15 kg
19	Taralga	523 m	1.0 kg	114
20	Bannaby	235 m	<1 kg	10 kg
21	Bannaby	1,010 m	7.0 kg	816 kg

Once specific controlled blasting locations are known, geotechnical investigations and further blast overpressure and vibration assessment would be undertaken, including development of a Blast Management Plan.

Aircraft noise from the use of helipads

Several of the proposed construction compounds and combined worker accommodation facility and construction compound would potentially include a helipad to enable helicopter use during construction.

Of the 13 potential locations considered for helipads, six locations with the least distance to sensitive receivers have predicted aircraft noise impacts (L_{Amax}) for some residential receivers (refer to Table 6-35). However, these impacts would be intermittent and typically only occur during helicopter arrival and departure at the helipad.

Table 6-35 Potential helipad locations predicted to have aircraft noise impacts

Site name	Distance to closest sensitive receiver	Number of receivers with potential aircraft L_{Amax} noise level	
		>75 dBA	>85 dBA
Amended Memorial Avenue compound (C14)	20 m	290	30
Ardrossan Headquarters Road compound (C17)	30 m	1	1
Tarcutta accommodation facility and compound (AC03)	170 m	4	-
Adjungbilly accommodation facility and compound (AC04)	210 m	2	-
Yass accommodation facility and compound (AC05)	120 m	7	1
Green Hills accommodation facility and compound (AC07)	110 m	1	-

Refer to *Technical Report 9 – Noise and Vibration Impact Assessment Addendum* for the predicted L_{Amax} noise level contours for all construction compounds with potential helipads.

Aircraft noise from flight within the transmission line corridor

Most aircraft use within the transmission line corridor would be for stringing work via either helicopter or drone. Aircraft may also be used to install final components such as conductor spacers on the newly installed transmission lines.

The assessment shows that up to 20 sensitive receivers may experience noise levels greater than 85 dBA during helicopter flights with the majority of nearby receivers experiencing 60 to 65 dBA during construction within the transmission line corridor. Drone flights at 170 feet above ground level (AGL) within the transmission line corridor are predicted to produce L_{Amax} noise levels less than 80 dBA at ground level and are considered unlikely to cause significant annoyance or impact the noise amenity of sensitive receivers.

Construction using aircraft would generally be progressive in nature, so the worst-case noise levels at any sensitive receiver would only be noticeable for a short duration as the work passes. Stringing and platform work is expected to take around six to nine days for every six kilometres of the transmission line.

Aircraft noise from helicopter flight outside the amended project footprint

Helicopters would be required to fly from the nominated helipad to and from designated transmission line structure work sites within the transmission line corridor. This component of helicopter use would typically include flight over areas outside of the amended project footprint and potentially outside of the noise and vibration amended study area. The predicted L_{Amax} noise levels show that helicopter flight outside of the amended project footprint is considered unlikely to cause significant annoyance or impact the amenity of sensitive receivers.

Helicopters would be flown at a minimum height of 1,000 feet (305 metres) AGL over towns and 500 feet (152 metres) AGL over unpopulated areas when travelling outside of the amended project footprint. Noise levels experienced by sensitive receivers from helicopters at heights of 500 feet (152 metres) and 1,000 feet (305 metres) AGL are expected to be equivalent to or less than a car passing by. Additionally, helicopter noise from flights outside of the amended project footprint are expected to be relatively short-

term and would likely be apparent for less than a minute at any individual sensitive receiver underneath the flight path.

6.9.2.2. Operational impacts

Operational impacts from the proposed Gugaa 500 kV substation

The predicted noise emissions from the proposed refinement at the proposed Gugaa 500 kV substation have increased compared to the EIS. The increase in predicted noise is due to additional equipment and the relocation of equipment closer to one residential receiver. However, it is noted that the noise producing equipment for the amended project has moved slightly further from one residential receiver.

Without transformer barriers, noise emissions are predicted to exceed the operational project noise trigger levels (PNTLs) by between two and seven decibels at the most affected residential receiver during the night-time with and without noise enhancing weather. With transformer barriers, noise emissions are predicted to be compliant with the PNTLs during standard weather. During noise enhancing weather, exceedances of up to one to four decibels are predicted at the three closest residential receivers during the night-time period.

However, the proposed Gugaa 500 kV substation will be designed to comply with the NPfI criteria as described in the EIS and Appendix B (Updated mitigation measures). This may include equipment layout and positioning, the selection of equipment with lower sound power levels and/or increased barrier length and height. It is also noted that the modelled sound power levels represent the maximum potential levels for all equipment and would be reviewed through further detailed design.

Operational impacts from transmission lines

The EIS project included operation of the section of the transmission line between the existing Wagga 330 kV substation and proposed Gugaa 500 kV substation at 330 kV. For the amended project, the transmission line between the two substations has been assessed as operating at 500 kV. However, energisation to 500 kV would only occur at the commissioning stage of the VNI West project. The amended project also includes the amended transmission line corridor section through the Green Hills State Forest and other minor corridor realignments.

The operational noise emissions of the transmission line operation have been assessed based on the offset distance at which the night-time PNTL of LA_{eq},15min 35 dBA is expected to be reached. Table 6-36 presents the results for the worst-case scenario during fair weather and Table 6-37 presents the results for the worst-case scenario during light rain or mist.

The fair weather scenario is considered to be representative of transmission line audible noise producing conditions most commonly occurring, or the ‘typical’ scenario. This is because days with rain in the amended noise and vibration study area have historically been observed for only between 14 and 36 per cent of days, depending on the location and season, and light rain or mist days would only form a portion of these days.

Table 6-36 Transmission line operational worst-case noise impacts (fair weather scenario)

Transmission line section	Number of residential receivers with night-time exceedance				Maximum distance from transmission line where night-time impacts (noise levels >35 dBA) are expected			
	EIS project only	Cumulative (EIS project plus existing)	Amended project only	Cumulative (Amended project plus existing)	EIS project only	Cumulative (EIS project plus existing)	Amended project only	Cumulative (Amended project plus existing)
Wagga 330 kV substation to proposed Gugaa 500 kV substation (during 500 kV operation)	N/A	N/A	1	1	N/A	N/A	70	187
Future Maragle 500 kV substation to Wondalga	-	N/A	0	0	91.5	223	91.5	91.5
Wondalga to proposed Gugaa 500 kV substation	2	N/A	2	2	82.5	120	82.5	120
Wondalga to Bannaby 500 kV substation	9	N/A	10	13	93	180	93	180

Table 6-37 Transmission line operational worst-case noise impacts (light rain or mist scenario)

Transmission line section	Number of residential receivers with night-time exceedance				Maximum distance from transmission line where night-time impacts (noise levels >35 dBA) are expected			
	EIS project only	Cumulative (EIS project plus existing)	Amended project only	Cumulative (Amended project plus existing)	EIS project only	Cumulative (EIS project plus existing)	Amended project only	Cumulative (Amended project plus existing)
Wagga 330 kV substation to proposed Gugaa 500 kV substation (during 500 kV operation)	N/A	N/A	10	14	N/A	N/A	395	487
Future Maragle 500 kV substation to Wondalga	4	4	3	3	366	442	366	366
Wondalga to proposed Gugaa 500 kV substation	6	6	5	5	326	348	326	348
Wondalga to Bannaby 500 kV substation	52	55	54	56	348	470	348	470

The assessment found:

- during typical fair weather conditions, 13 of the residential receivers closest to the amended project footprint are predicted to experience noise levels from the amended project transmission line above the most stringent night-time PNTL
- during L50 conditions (light rain or mist), which is expected to be the infrequently occurring worst-case condition for audible noise impacts, 72 of the residential receivers closest to the amended project footprint are predicted to experience noise levels from the amended project transmission line exceeding the most stringent night-time PNTL
- cumulative noise emissions from the amended project and existing 330 kV lines are expected to be marginally greater than the noise emission from the amended project transmission lines alone where the existing line would run parallel to the amended project
- the total number of residential receivers predicted to have potential transmission line noise impacts has increased compared to *Technical Report 9 – Noise and Vibration Impact Assessment* by two during typical fair weather and 13 during light rain conditions, which is primarily due to the refinement to assess the transmission line between the existing Wagga 330 kV substation and the proposed Gugaa 500 kV substation as operating at 500 kV for the amended project.

6.9.3. Updated mitigation measures

The approach to avoidance/minimisation and management of noise and vibration impacts remains generally consistent with description provided in Chapter 15 (Noise and vibration) of the EIS. In response to the amendments and refinements, a minor amendment has been made to NV1 and NV2 so that they apply to the appropriate amended project locations, an update to NV3 has been made to address the potential controlled blasting areas identified, and an update has been made to NV9 to commit to a detailed operational noise assessment. In addition, a new mitigation measure (NV10) has been proposed to minimise aircraft noise at sensitive receivers. The updates are shown in **green** and ~~**strikethrough**~~ in Table 6-38. The consolidated list of mitigation measures for the amended project is provided in Appendix B (Updated mitigation measures).

Table 6-38 Summary of revised noise and vibration mitigation measures

Reference	Impact	Mitigation measures	Timing	Relevant location
NV1	Construction noise	Where receivers are predicted to be noise affected and near construction compounds or fixed work ~~areas~~ **sites** with long durations (ie several months), path control, such as hoarding or earth bunds will be investigated. Practical measures will be implemented where required. Positioning of site structures will also be considered to act as barriers between noisy work and receivers where practical.	Detailed design and construction	• ~~Wagga 330 kV substation compound (C01)~~ • ~~Memorial Avenue compound (C14)~~ • ~~Bowmans Lane compound (C15)~~ • ~~Tumbarumba accommodation facility (AC1)~~ **Construction compounds and worker accommodation facilities**
NV2	Construction noise	An out-of-hours work protocol that details how the project will identify, assess and approve out-of-hours work outside standard construction hours that are likely to generate noise levels that exceed the relevant noise management levels at sensitive receivers will be developed and implemented. The protocol will include provisions to: • carry out additional assessments for work proposed outside standard construction hours, to confirm noise levels at potentially affected sensitive receivers and determine suitable mitigation measures to minimise noise levels • notify and engage with potentially noise affected receivers about upcoming work outside standard construction hours and address any associated complaints • identify appropriate respite for noise affected receivers (where required). The out-of-hours work protocol will not apply to the operation of the worker accommodation ~~facility~~ **facilities**.	Detailed design and construction	All locations

Reference	Impact	Mitigation measures	Timing	Relevant location
NV3	Construction noise and vibration	~~**If blasting is required, a**~~ **A** Blast Management Plan will be developed to minimise the potential for **airblast overpressure and vibration** impacts. Maximum instantaneous charge calculations will be ~~**carried out**~~ **undertaken** for specific ~~**sites where blasting is required**~~ **locations within the potential controlled blasting areas**. Individual blast designs will be based on meeting the criteria rather than restrictions on maximum instantaneous charge. All ~~**blasts**~~ **controlled blasting**, including initial **controlled** trial ~~**blasts**~~ **blasting** will be monitored to obtain data which can be used to confirm site constants and compliance with **controlled** blasting criteria. Landowner notification and consultation requirements will be identified in the Blast Management Plan.	Detailed design and construction	All locations
NV9	Operational transmission line noise	~~**Receivers potentially noise affected by operational transmission line noise will be reviewed once the final project transmission line route, conductor arrangement and any property acquisitions are known.**~~ **A detailed operational noise assessment will be undertaken based on the final project transmission line route, conductor arrangement and confirmation of any property acquisitions, to confirm potentially noise affected receivers.** For each residence where potential operational noise levels are predicted to exceed project trigger levels, noise monitoring to confirm actual operational noise levels ~~**would**~~ **will** be carried out: • at representative locations within six months of the commencement of operation; and • at the request of the landowner of the residence at any time within two (2) years after the commencement of operation. The noise monitoring will occur during weather/atmospheric conditions conducive to generating the corona effect. For residences where the monitoring identifies corona discharge noise levels above 35 dB(A) LAeq, 15min at the reasonably most affected point of the residence, consultation will be undertaken with the landowner of the affected residence to identify solutions. Once the appropriate solutions have been agreed with the landowner, these will be implemented within 12 months.	Detailed design and operation	Transmission lines

Reference	Impact	Mitigation measures	Timing	Relevant location
NV10	Construction aircraft noise	Management measures will be implemented to minimise aircraft noise at sensitive receivers where practicable and appropriate. Measures will include (but are not limited to): • Carrying out consultation to notify nearby sensitive receivers of upcoming work involving aircraft. This will include scheduled use of helipads within construction compounds and combined worker accommodation facilities and construction compounds, flight paths outside of the project footprint and stringing or other work within the transmission line corridor. Notification will include scheduled dates, locations, indicative hours and a description of the proposed work. • Prioritising use of potential helipad locations at the construction compounds and combined worker accommodation facilities and construction compounds with the maximum distance offset from sensitive receivers. • Varying flight paths between helipads and the transmission line corridor to avoid repeated helicopter noise at sensitive receivers. • Operating aircraft in accordance with Airservices Australia (ASA) *Environmental Principles and Procedures for Minimising the Impact of Aircraft Noise* (2002) and the Helicopter Association International (HAI) *Fly Neighbourly Guide*.	Construction	All locations

6.10. Soils, geology and contamination

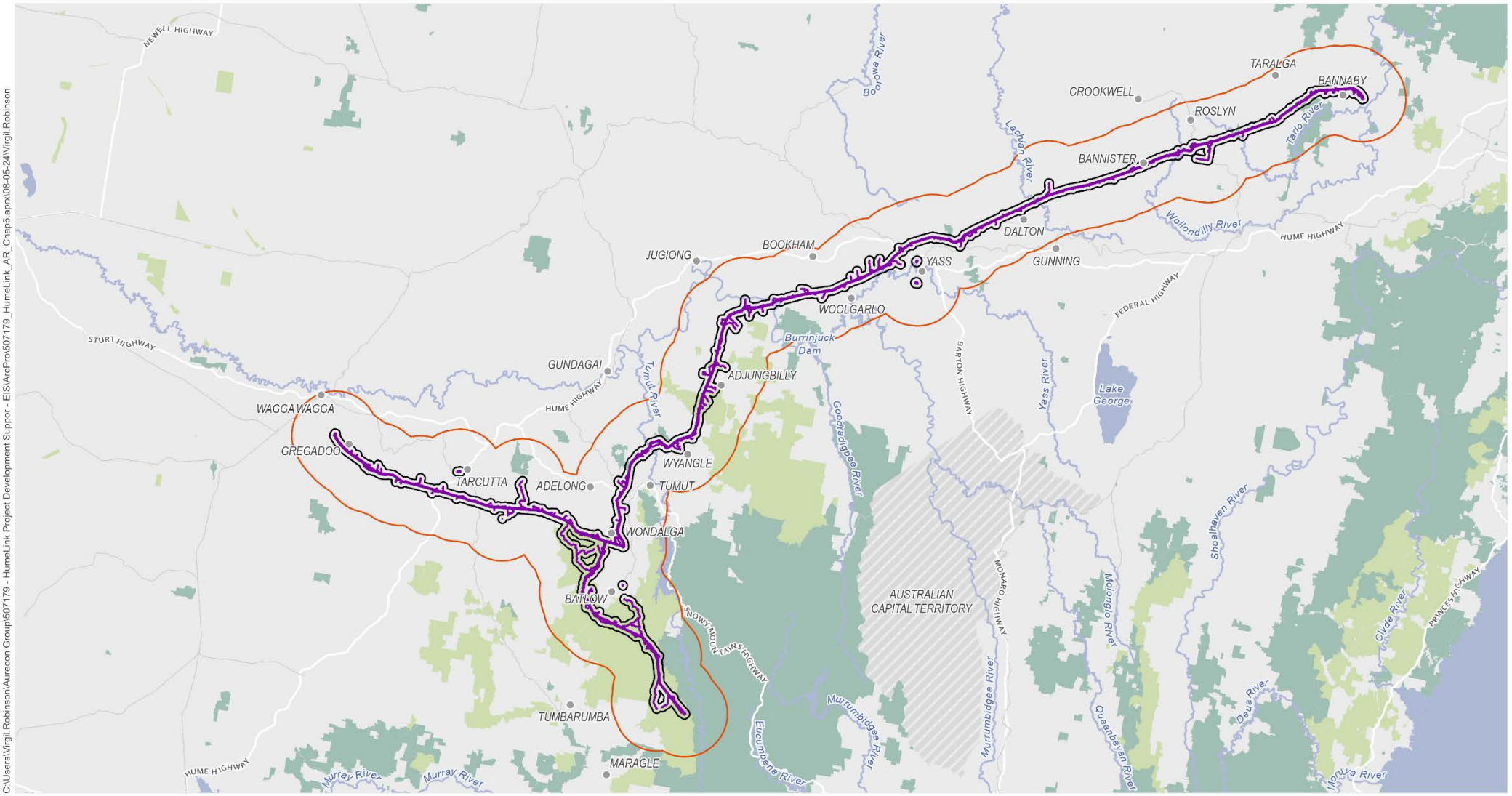
6.10.1. Approach to assessment

Technical Report 10 – Phase 1 Contamination Assessment Addendum has been prepared to consider the potential soils, geology and contamination impacts from the proposed amendments and refinements to the project.

There has been no change to the legislative and policy context presented in *Technical Report 10 – Phase 1 Contamination Assessment* prepared for the EIS. The assessment of the amendments and refinements has been largely prepared in accordance with the assessment approach methodology outlined in *Technical Report 10 – Phase 1 Contamination Assessment*. Additional key tasks were carried out to consider the proposed amendments and refinements including:

- undertaking additional desktop assessment where required
- conducting field surveys between 16 October and 20 October 2023 at select locations in the amended project footprint
- confirming the presence of any additional areas of environmental concern (AECs) and potential construction and operational impacts.

The amended contamination study area covers the amended project footprint plus a one-kilometre buffer, refer to Figure 6-7. In addition, a 10 kilometre radius around the amended project footprint was used as a search area for the purpose of the NSW Government per- and poly-fluorinated alkyl substances Investigation Program and Department of Defence Unexploded Ordnance desktop searches.



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-7: Amended contamination study area

6.10.2. Assessment of amendments and refinements

6.10.2.1. Construction impacts

Potential to encounter contamination

During construction of the amended project, there is the potential to:

- disturb existing contamination via construction activities or generate erosion of soils via removal of vegetation
- mobilise contaminants and sediments which may impact adjacent soils, surface water and groundwater
- increase the migration of contaminants into surrounding areas via leaching, overland flow and/or subsurface flow (water and/or vapour) or dust, which could potentially impact major receiving environments including the Tumut River, Murrumbidgee River and Wollondilly River, and other minor receiving environments (streams and minor waterways) present within the amended contamination study area
- impact sensitive receivers such as flora and fauna through the mobilisation and migration of contaminants thereby degrading existing environmental conditions
- increase the risk of exposure to contaminants, either through direct or indirect exposure, to site workers, landowners, as well as the local community.

Several AECs, which could potentially be encountered during construction of the amended project have been identified in Table 6-39. These AECs are related to the amended project and are in addition to the AECs identified in *Technical Report 10 – Phase 1 Contamination Assessment* prepared for the EIS. Refer to Section 4.5.2 of *Technical Report 10 – Phase 1 Contamination Assessment Addendum* for further information on AEC risk ratings. Two AECs presented in Chapter 16 (Soils, geology and contamination) and in *Technical Report 10 – Phase 1 Contamination Assessment* prepared for the EIS, are no longer relevant to the project: Bellette Landfill and Tumut Resource Recovery Centre, and Batlow Landfill. Refer to Figure 6-8 for details of AECs associated with the amended project.

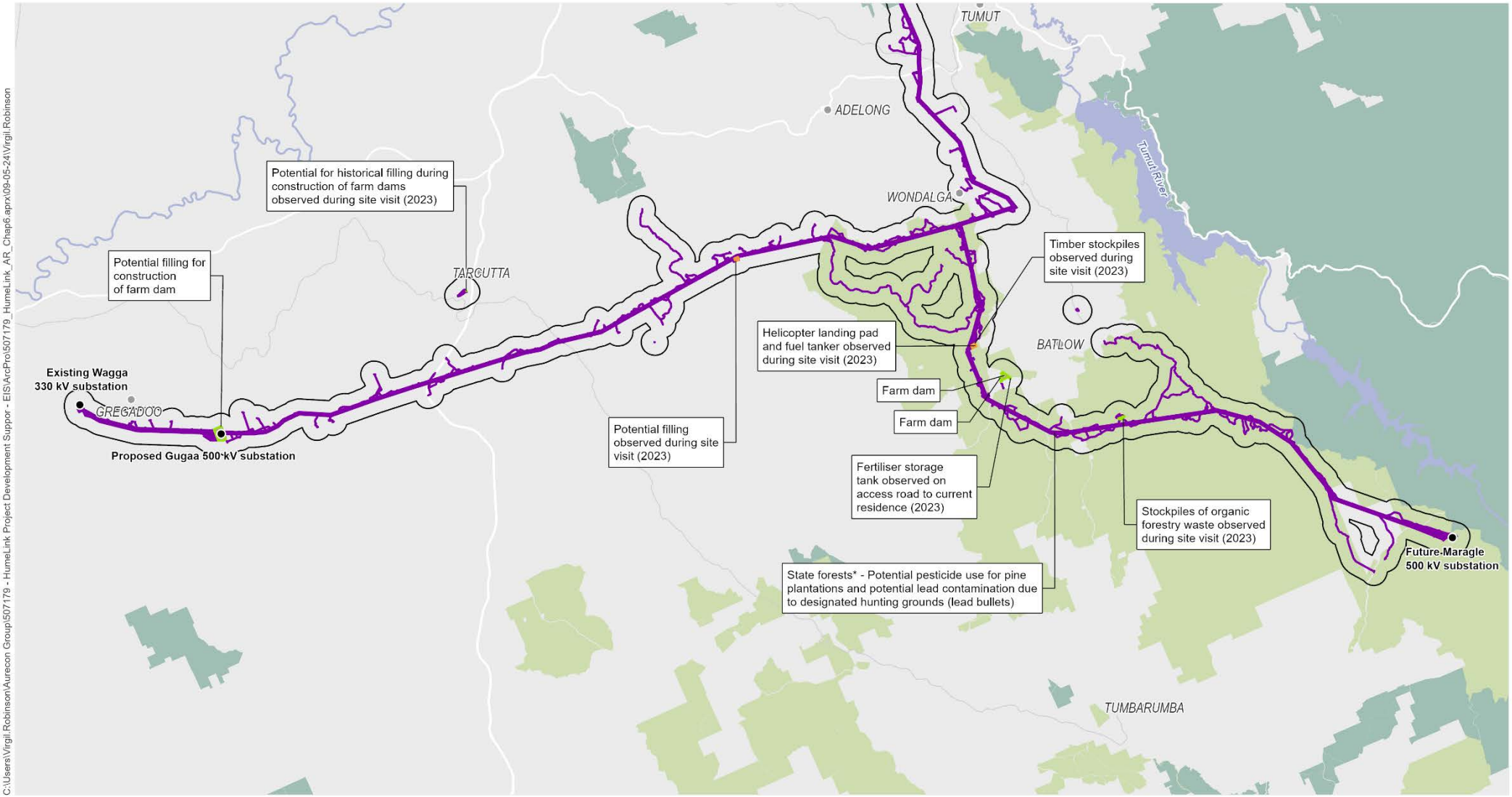
Table 6-39 Additional areas of environmental concern within the amended contamination study area

AECs	Rationale for concern	Risk rating*
Existing transmission line infrastructure (amended sections only)	Onsite spills and leaks from maintenance activities, asbestos and/or lead paints on transmission line structures	Low[1]
Farm dams (amended sections only)	Areas of potential contaminant sediment build-up (sink)	Low
Cleared improved agricultural land (including cropping and irrigated land in amended sections only)	Historical use of pesticides, herbicides and fertilisers, large scale land clearance and heavy machinery use	Low
Areas with pesticide use, including Hume Forest and FCNSW owned land (amended sections only)	Ongoing use of pesticides, including for pine plantations	Low
Designated hunting grounds (within Green Hills corridor amendment)	Lead bullets used within hunting grounds	Low
Areas of disturbed land, uncontrolled fill, waste stockpiling and potential dumping (new and amended construction compound and combined worker accommodation facilities and construction compounds – C06, AC03, C17, C18, C19, C21, C12, AC05)	Areas with stockpiles and earthworks	Moderate[2]

AECs	Rationale for concern	Risk rating*
Helicopter landing pad and fuel tanker observed during site visit (2023)	Potential fuel spills or leaks from the fuel tanker	Low
Yass Sewage Treatment Plant	Sewage treatment plants are associated with a range of COPCs include TPH/TRH, BTEX, heavy metals, OCPs, OPPs and pathogens. If managed incorrectly, disturbance of contaminated soil has the potential to result in impacts to human health and/or the environment.	Moderate
Fertiliser storage tank observed (2023)	Potential for spills or leaks from the Fertiliser storage tank.	Low

Note:

1. Low: It is possible that harm could arise to a designated receiver from an identified source, though this is likely to be mild.
2. Moderate: It is possible that harm could arise to a specific receiver, but it is unlikely that such harm would be major.



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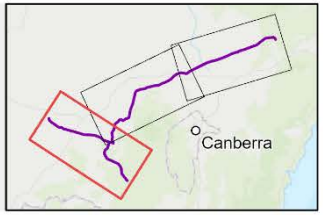
Amended project footprint
Amended contamination study area
National park and reserve
State forest
Waterbody
Waterway
Major road
Railway
Substation

Areas of Environmental Concern

Risk Rating

Low
Moderate

*State forests intersecting the Green Hills corridor amendment considered low risk AECs



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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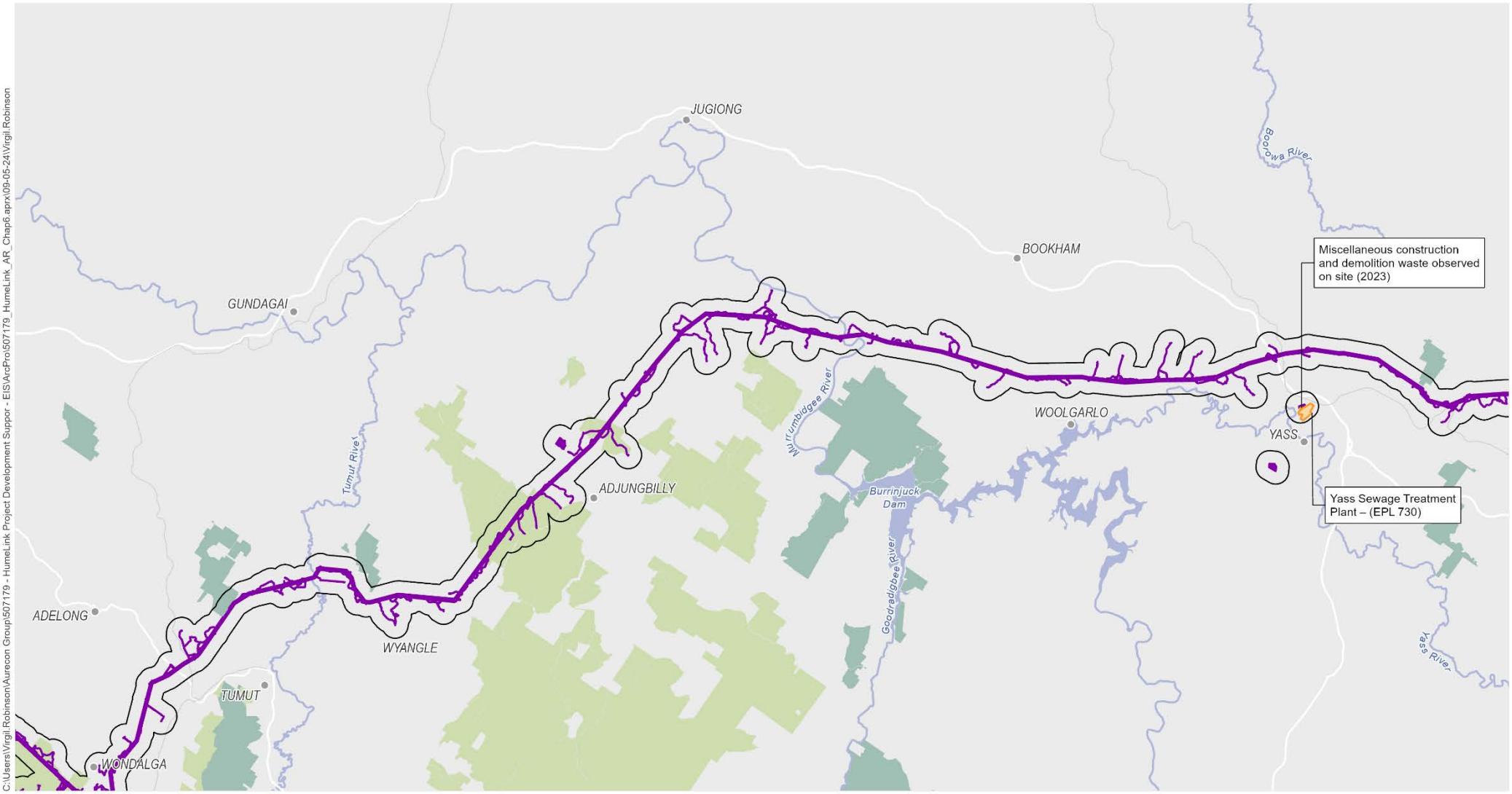
Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-8a: Potential areas of environmental concern for contamination



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Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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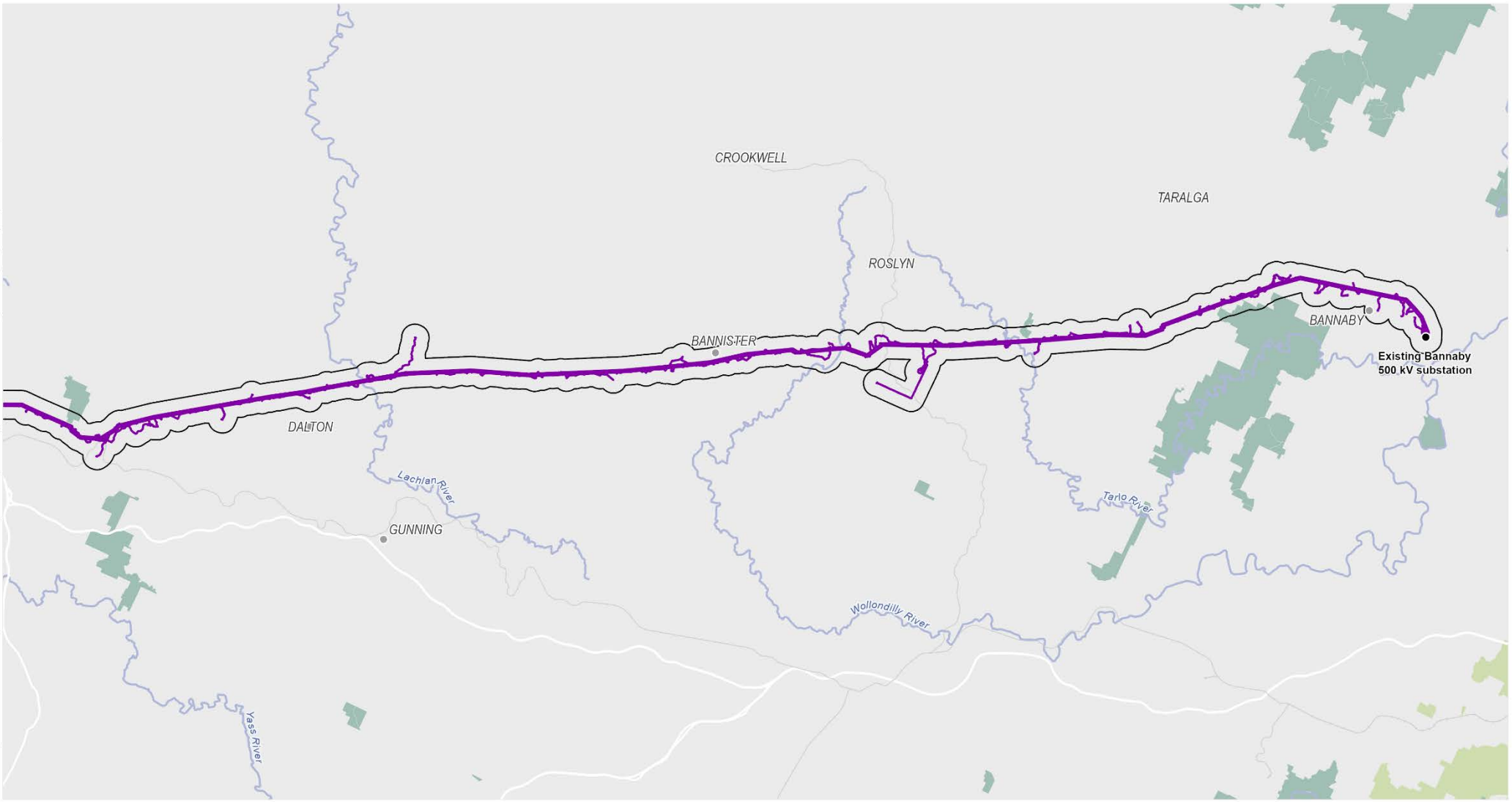
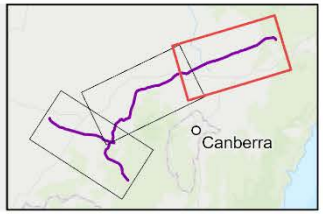
Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-8b: Potential areas of environmental concern for contamination



Amended project footprint
Amended contamination study area
National park and reserve
State forest
Waterway
Major road
Railway
Substation



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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FIGURE 6-8c: Potential areas of environmental concern for contamination

Potential impacts of contamination on the amended project

This section focuses on any additional impacts identified for the amended project compared to the EIS.

As with the EIS, a qualitative risk ranking method was used to assess the risk of impacts of contamination on construction of the amended project. Seven additional AECs were evaluated as having low risk rankings for their potential contamination impacts on the amended project.

Two AECs within the amended project footprint were identified to have a moderate risk ranking for encountering contamination during construction. These include Yass Sewage Treatment Plant and areas of existing disturbed land, uncontrolled fill, waste stockpiling and potential dumping (at new and amended construction compound and combined worker accommodation facilities and construction compounds – C06, AC03, C17, C18, C19, C21, C12, AC05). Construction activities proposed within or in proximity to these AECs include excavation activities, vegetation clearance, stripping and grubbing, stockpiling, utility work and vehicle movement.

If these activities are not properly managed, the disturbance of contaminated soil has the potential to cause moderate (localised) risk to sensitive receivers (including flora and fauna) and human health for the construction workers on the amended project. Unexpected contamination conditions may be encountered due to previously unknown heterogeneities in the subsurface, soil contamination not previously identified, or changes in the amended project scope. The potential risk associated with unexpected contamination finds has not been assessed as this would be managed in accordance with an Unexpected Contamination Finds Protocol during construction.

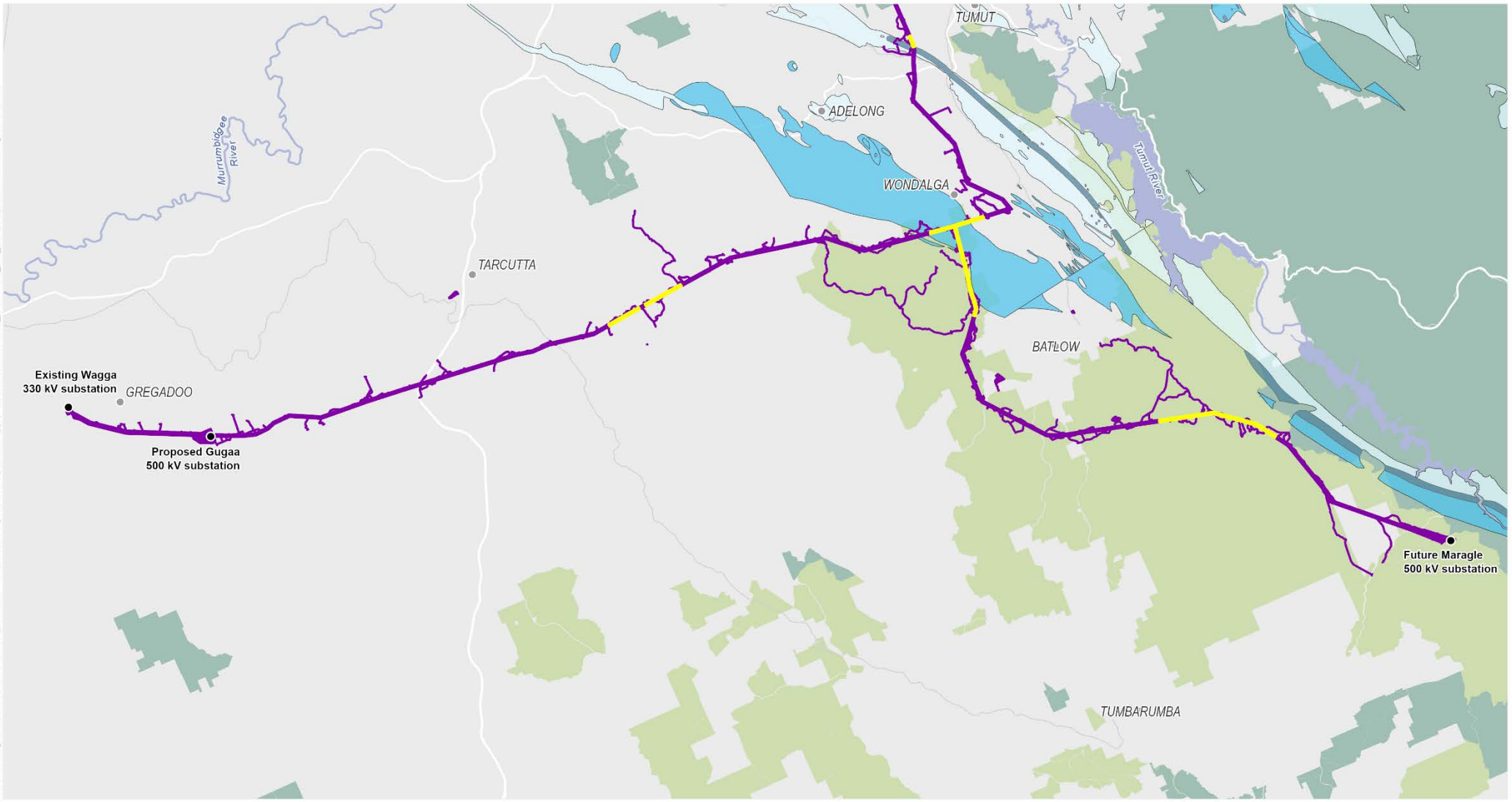
Further construction planning has confirmed the need for controlled blasting in areas along the transmission line corridor. Controlled blasting would be used for some construction activities where hard rock has been identified. In some of the proposed controlled blasting areas, a medium to high potential for naturally occurring asbestos (NOA) has been identified, which could result in the mobilisation of asbestos fibres if NOA is disturbed, improperly stockpiled or not managed appropriately, which may present a risk to human health during construction. This is considered a moderate (localised) risk that would be managed in accordance with revised mitigation measure SC5. Refer to Figure 6-9 for details on NOAs in proximity to controlled blasting areas for the amended project.

The risk of groundwater contamination on the amended project is unlikely and impacts would be consistent with the groundwater contamination risk outlined in *Technical Report 10 – Phase 1 Contamination Assessment*. Based on the potential to encounter contamination in AECs during construction, there is a low risk of groundwater contamination from ground disturbance.

Potential impacts of the amended project on contamination

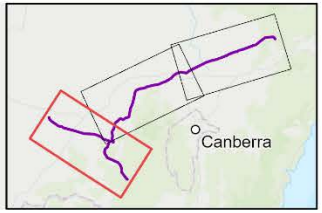
Construction activities have the potential to introduce contamination (eg from leaks and spills or inappropriate management of contaminated soils or materials) to the environment within the amended project footprint remains unchanged from that described in *Technical Report 10 – Phase 1 Contamination Assessment* prepared for the EIS.

Potential impacts would be minimised through the implementation of mitigation measures provided in Appendix B (Updated mitigation measures).



Amended project footprint
Potential controlled blasting area
National park and reserve
State forest
Waterbody
Waterway
Major road
Railway
Substation

Naturally Occurring Asbestos Potential
High Asbestos Potential
Medium Asbestos Potential
Low Asbestos Potential



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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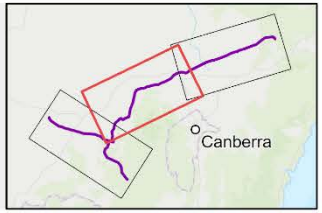
Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-9a: Overview of indicative controlled blasting locations

Amended project footprint
Potential controlled blasting area
National park and reserve
State forest
Waterbody
Waterway
Major road
Railway
Naturally Occurring Asbestos Potential
High Asbestos Potential
Medium Asbestos Potential
Low Asbestos Potential



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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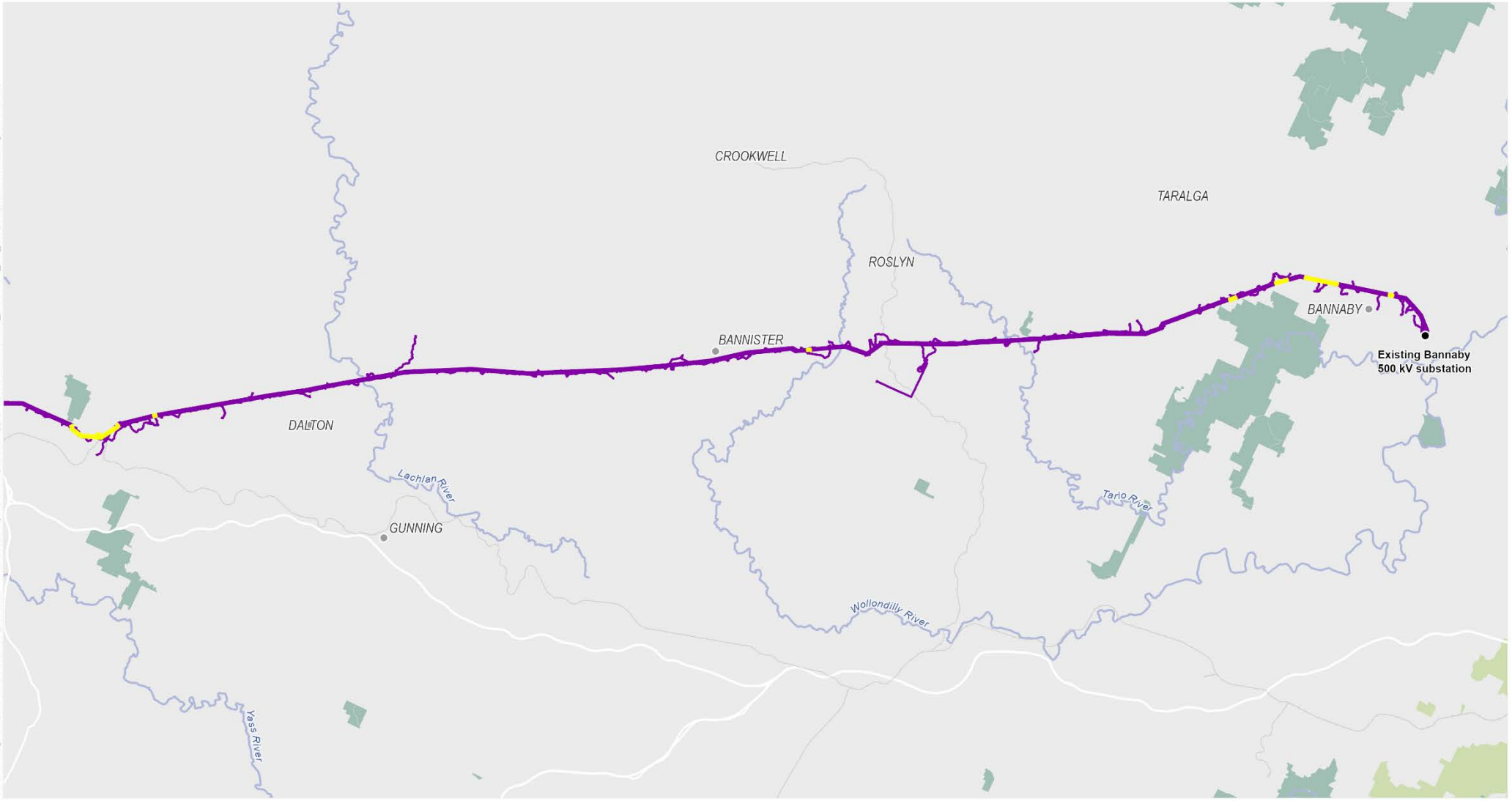
FIGURE 6-9b: Overview of indicative controlled blasting locations



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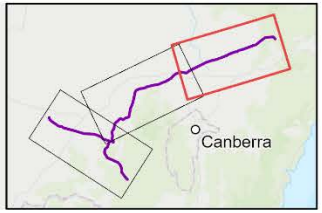
Amended project footprint
Potential controlled blasting area
National park and reserve
State forest
Waterway
Major road
Railway
Substation



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-9c: Overview of indicative controlled blasting locations

6.10.2.2. Operational impacts

Potential impacts associated with soil, geological and contamination risks during operation of the amended project remains consistent with *Technical Report 10 – Phase 1 Contamination Assessment* prepared for the EIS.

6.10.3. Updated mitigation measures

The management of soils, geology and contamination impacts remains consistent with the mitigation measures provided in Chapter 16 (Soils, geology and contamination) of the EIS. An update to mitigation measure SC5, shown in **green** in Table 6-40, has been made to further manage the risk to encountering naturally occurring asbestos. The consolidated list of mitigation measures for the amended project is provided in Appendix B (Updated mitigation measures).

Table 6-40 Summary of revised soils, geology and contamination mitigation measures

Reference	Impact	Mitigation measures	Timing	Relevant location
SC5	Naturally Occurring Asbestos	**Detailed design will consider the risk of encountering naturally occurring asbestos (NOA) within the project footprint. Consideration may include movement of footings to areas with less risk of NOA, footing design changes or minimising rock blasting and ripping where practicable.** An Asbestos Management Plan will be prepared in accordance with the NSW Government Code of Practice *How to Manage and Control Asbestos in the Workplace* (SafeWork, 2020). The Asbestos Management Plan will include the following measures: • management or isolation of areas mapped as medium to high risk of NOA, where direct disturbance of NOA is confirmed to be required for project construction works • placement of suitable signage around the work areas • list of appropriate personal protective equipment, including Respiratory Protective Equipment • implementation of dust suppression controls including wetting surfaces, covering disturbed surfaces and the use of sealed air-conditioned vehicles to minimise potential asbestos impacts to workers • decontamination of the workers' coveralls, personal protective equipment, equipment and work site • procedures for the disposal of NOA material or waste, if required • implementation of air monitoring using pumps and sample filter grid cowls for asbestos fibres and dusts if it is suspected that exposure to NOA dust during work might exceed safe levels of airborne asbestos. The air monitoring pumps, and reporting, must be undertaken by a licensed asbestos assessor.	Detailed design and construction	All locations

6.11. Surface water and groundwater quality

6.11.1. Approach to assessment

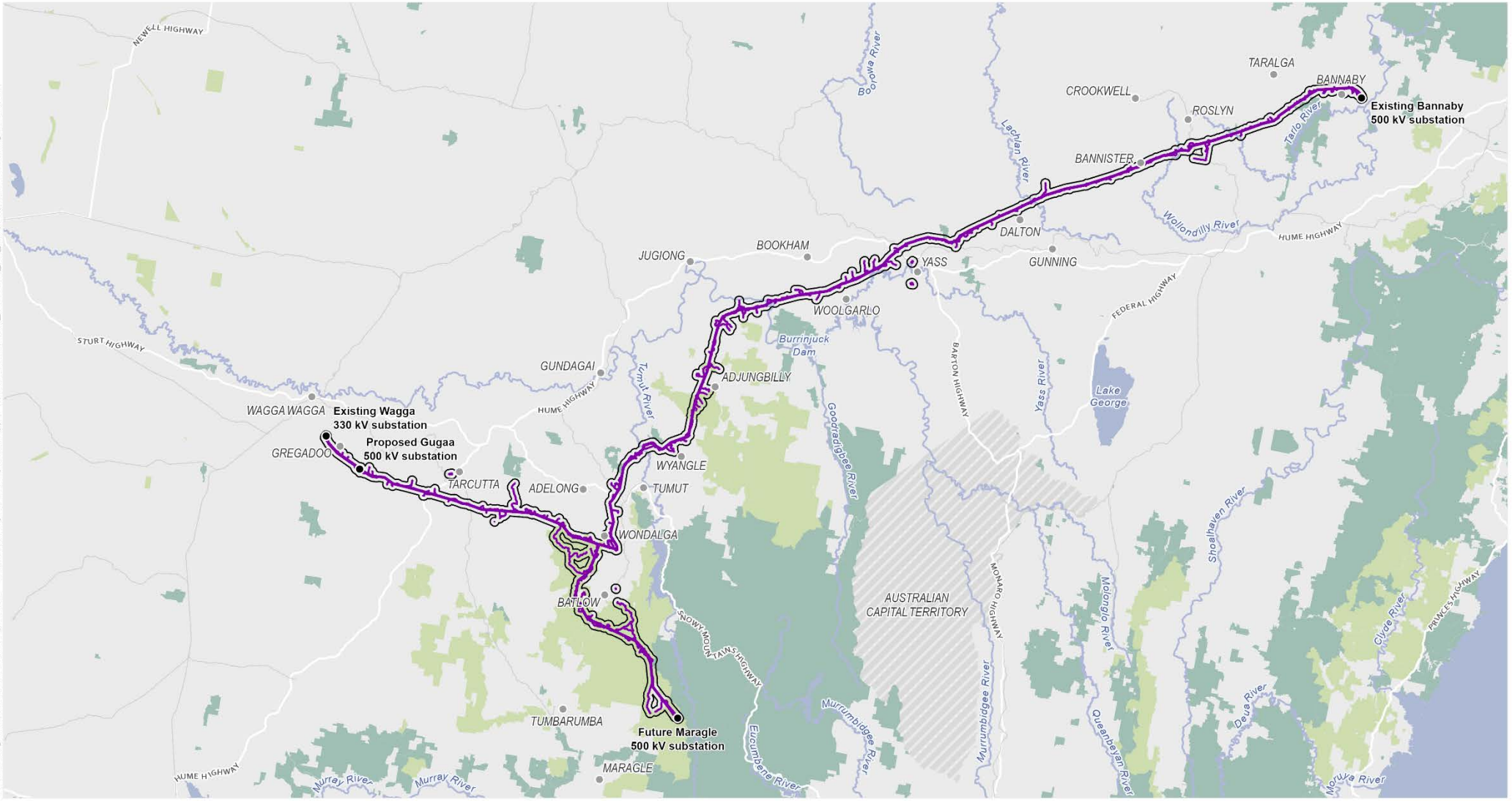
Technical Report 12 – Surface Water and Groundwater Impact Assessment Addendum has been prepared to consider the potential surface water and groundwater quality impacts from the proposed amendments and refinements to the project.

There has been no change to the legislative and policy context presented in *Technical Report 12 – Surface Water and Groundwater Impact Assessment* prepared for the EIS or the methodology and assessment of potential surface water and groundwater quality impacts of the project.

The assessment of the amendments and refinements to the project included:

- updating the erosion hazard and waterfront land proximity analysis for the amended project footprint
- potential controlled blasting locations and their proximity to sensitive environments
- identification of access track waterway crossings and whether they are on waterfront land (ie with 40 metres of a waterway)
- waterway survey (including an additional site visit between 16 October 2023 and 20 October 2023)
- water supply assessment and identification of focus areas for water supply.

The surface water and groundwater study area was updated to capture the amended project footprint with a one kilometre wide buffer either side (refer to Figure 6-10).



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Amended project footprint
Amended surface water and groundwater study area
National park and reserve
State forest
Waterbody
Waterway
Major road
Railway
Substation

Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:925,000
0 20 40km

Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-10: Amended surface water and groundwater study area

6.11.2. Assessment of amendments and refinements

6.11.2.1. Construction impacts

Water supply

Construction water requirements for the amended project are estimated to be 429 megalitres (ML) of non-potable water and 286 ML of potable water. The estimated non-potable water demand is 69 ML less than the estimate presented in the EIS. Conversely, the estimated potable water demand of the amended project is 220 ML greater than the estimate presented in the EIS. These changes reflect that the EIS did not account for the use of potable water for temporary workers as they were expected to be accommodated in existing short-term accommodation in local towns. As such, because the amended project is now accommodating the majority of the workers in five worker accommodation facilities, the construction project water estimate has increased accordingly. Transgrid or the construction contractors may purchase a zero allocation Water Access Licence (WAL) in a specific Water Sharing Plan (WSP) area, which would enable them to buy water from existing groundwater allocation holders who may wish to temporarily sell their water allocation (or part of their water allocation). Therefore, this would not be a burden on current water supplies.

It is likely that a combination of water sources would be required to meet the total non-potable water demand. The various non-potable water sources include:

- sediment basins/ farm dams/ wastewater/ rainwater tanks
- groundwater
- surface waterways.

It is likely that a combination of water sources would be required to meet the total potable water demand. The various potable water sources, in recommended order, include:

1. direct connection to council water reticulation system
2. transported from nearby town/s via water cart/tanker
3. purchased from third party commercial supplier
4. on-site water treatment systems in conjunction with non-potable sources outlined above.

The potential impacts from water supply on non-potable water sources/users would be negligible as purchasing water from an existing WAL holder with predetermined extraction volumes would have already been evaluated and deemed to be acceptable via the relevant approvals process.

Wastewater generated at the combined worker accommodation facilities and construction compounds would require a connection into the town sewerage networks, where possible. However, in most instances, wastewater from these facilities would be collected in tanks which would be pumped out into a tanker. The tanker would dispose of any wastewater at local sewage treatment plants. The total daily volume of wastewater generated during construction is expected to be about 50 to 100 kilolitres (kL) per worker accommodation facility.

Impacts associated with water quality, erosion and sedimentation

Construction activities in proximity to waterways have the greatest potential to impact water quality as a result of erosion and sedimentation.

Due to the amendments and refinements, the waterways impacted differ along the alignment compared to the EIS. There are 111 named waterways that are intercepted by amended transmission line corridor. Analysis undertaken to quantify the potential erosion and sedimentation risk indicated that approximately 74 per cent of the amended transmission line corridor is considered to have a low risk, 24 per cent moderate risk and two per cent high risk, refer to Figure 6-11. Refer to Figure 6-12 for the major waterway crossings within the amended project footprint. With the implementation of mitigation measure SW1 (refer to Section 6.11.3), the management of work occurring on waterfront land (including for waterway crossings) would be reduced.

Access tracks have the greatest potential to impact waterways when they are located within waterfront land or cross waterways. Ten proposed access tracks have been identified as crossing Strahler 4th order waterways, which may require the establishment of waterway crossings. Environmental management measure SW2 would ensure that all work within and in proximity to waterway crossings would be appropriately designed. Wherever possible, existing roads, tracks and other existing disturbed areas would be used to minimise vegetation clearing or disturbance.

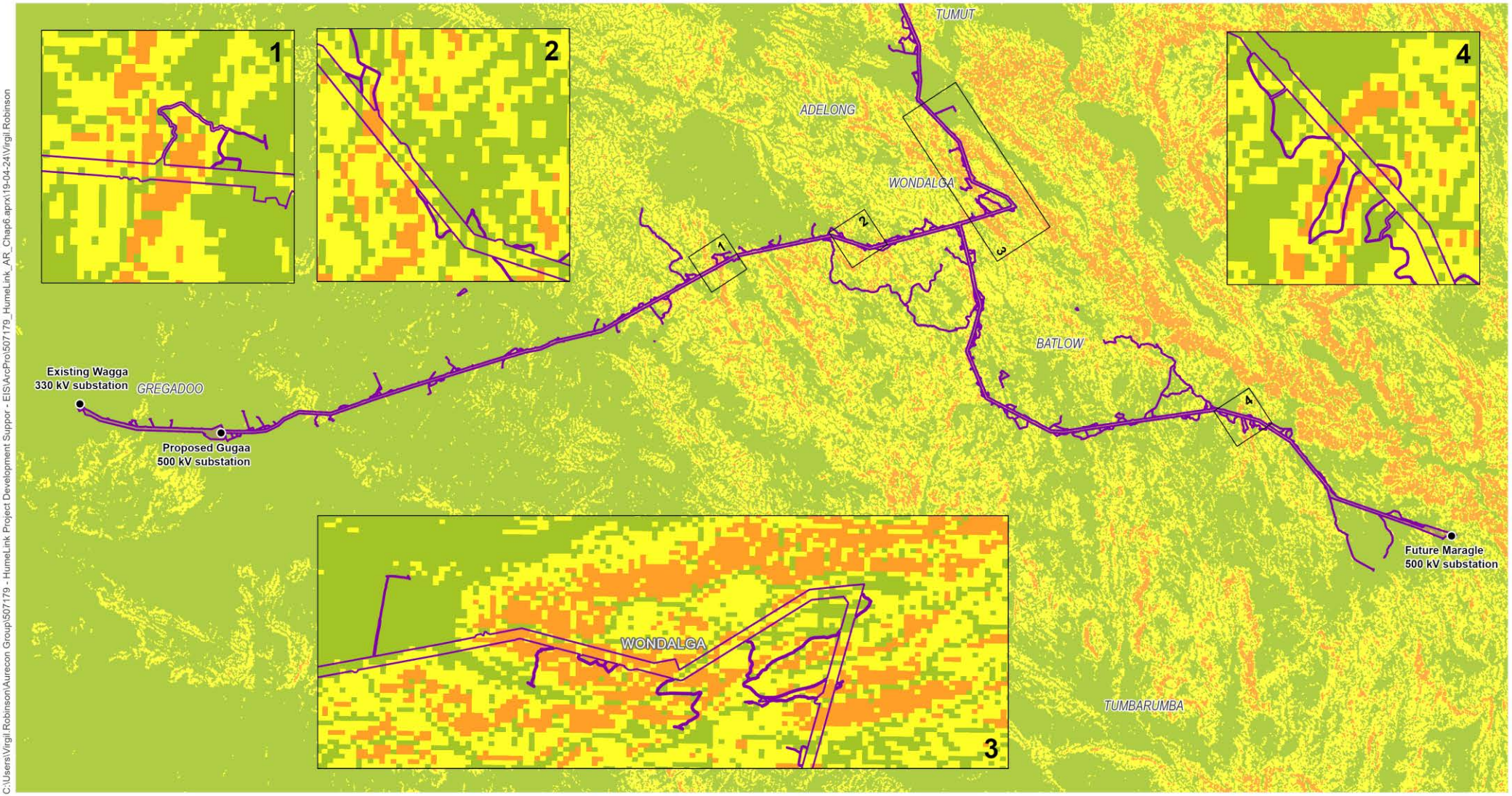
The clearing of riparian vegetation could result in sedimentation and erosion impacts and associated water quality impacts in waterways, however this would be minimised with appropriate mitigation measures. For waterway crossings a site-specific sedimentation and erosion control plan would need to be prepared in accordance *with Managing Urban Stormwater – Soils and Construction, Volume 1* (Landcom, 2004), commonly referred to as the Blue Book, and other relevant guidelines.

The change in location of construction compounds and worker accommodation facilities, which would include concrete batching plants, and associated materials and chemicals/fuel storage and use, could (if unmitigated) impact on water quality at a localised level. There are 11 ancillary facilities (construction compounds and combined worker accommodation facilities and construction compounds) located on waterfront land. Of these, the Ellerslie Road compound (C21) and Yass accommodation facility and compound (AC05) are located on waterfront land (ie within 40 metres of a waterway) of Strahler 5th order streams[4] namely, Yaven Yaven Creek and Bango Creek. Due to their proximity to these waterways, there would be a higher risk of potential sedimentation and therefore higher impact magnitude, from ground disturbing activities (ie earthworks, vegetation clearing) during site establishment and any material storage during construction. With the implementation of mitigation measure SW1 (refer to Section 6.11.3), sedimentation impacts would be managed through an Erosion and Sediment Control Plan.

The areas identified for the proposed telecommunications connections to the existing Gullen Range 330 kV substation and Gadara 132 kV substation are mostly clear of vegetation. The cables connecting these substations would cross Ryans Creek, a Strahler 1st order stream. Earthworks may be required to run the cabling through Ryan's Creek which has the potential to impact water quality, and increase erosion risk and sedimentation. Earthworks have the potential to increase erosion and sedimentation of Ryans Creek, the magnitude of impact is considered moderate due to the proximity of the works to Ryan's Creek.

Any sedimentation and erosion impacts on surface water would be adequately managed with the implementation of the Erosion and Sediment Control Plan described in SW1, refer to Figure 6-11.

[4] The Strahler stream order classification is a 'top down' system in which streams of the first order have no upgradient streams flowing into them (DPE, 2022b). If two streams of the same order merge, the resulting stream is given a number that is one higher. If two rivers with different stream orders merge, the resulting stream is given the higher of the two numbers. Under the Strahler stream order classification, first to third order streams are typically headwater streams. Streams classified as fourth through to sixth order are typically medium streams, and streams that are seventh order or larger are typically rivers.



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Amended project footprint

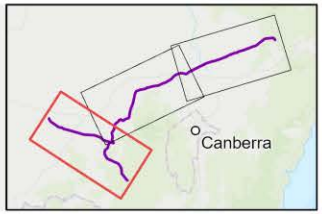
Substation

Soil erosion, bare

Low: up to 200 t ha^{-1} yr^{-1}

Moderate: between 200 and 1000 t ha^{-1} yr^{-1}

High: greater than 1000 t ha^{-1} yr^{-1}



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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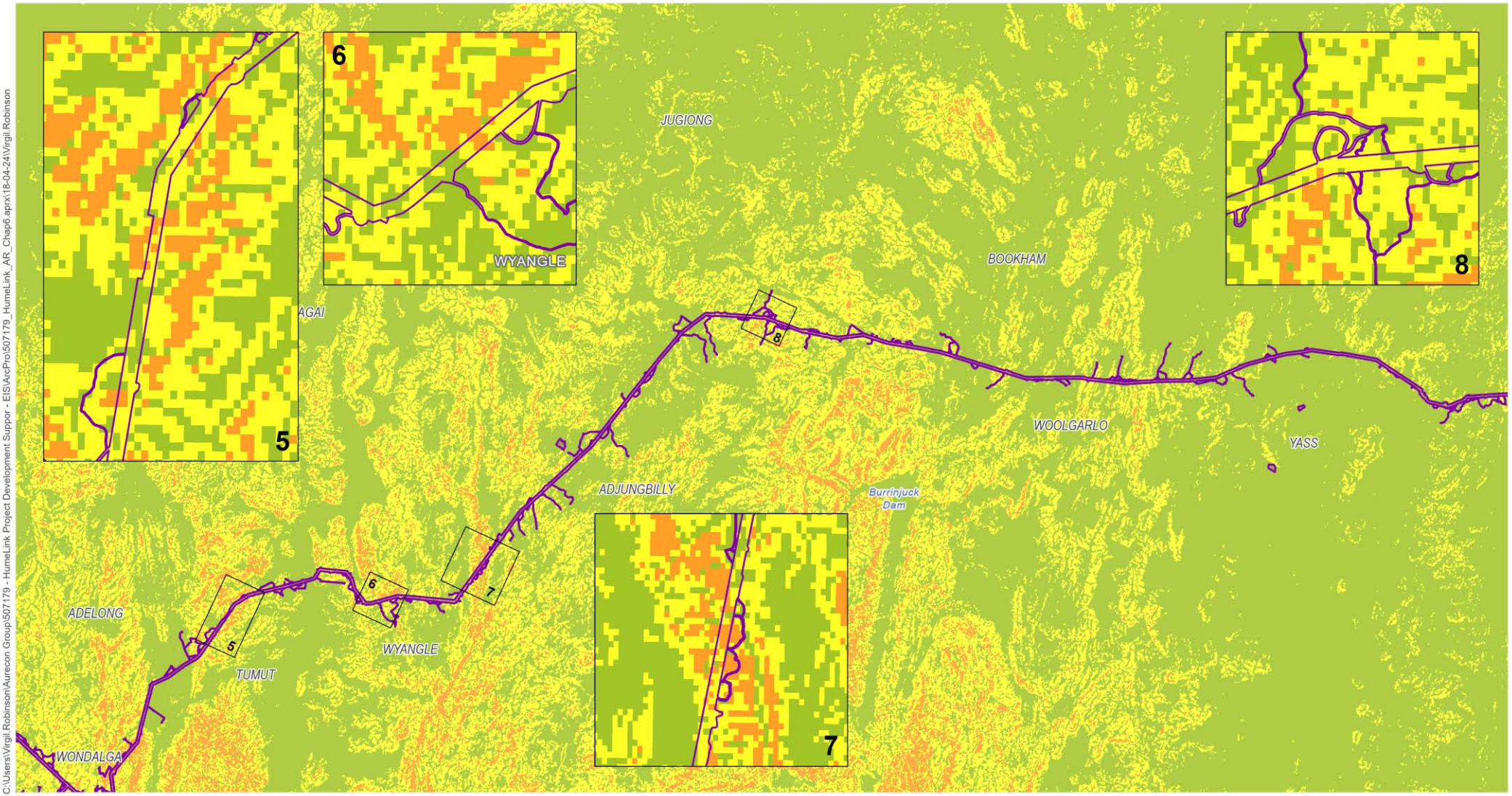
0 7 14 km

Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-11a: Modelled soil erosion



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Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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FIGURE 6-11b: Modelled soil erosion

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Amended project footprint

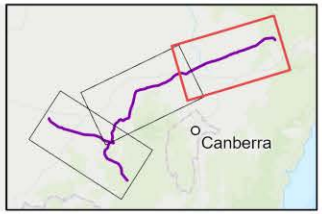
Substation

Soil erosion, bare

Low: up to 200 t ha^{-1} yr^{-1}

Moderate: between 200 and 1000 t ha^{-1} yr^{-1}

High: greater than 1000 t ha^{-1} yr^{-1}



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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0 7 14 km

Projection: GDA 1994 MGA Zone 55

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FIGURE 6-11c: Modelled soil erosion

Impacts associated with changes to geomorphology

As outlined above, Ellerslie Road compound (C21) and Yass accommodation facility and compound (AC05) are located on waterfront land of Strahler 5th order streams (Yaven Yaven Creek and Bango Creek). Without mitigation, sedimentation from construction activities such as vegetation removal, earthworks and material storage could result in a potential moderate indirect impacts on the geomorphology (landscape and natural processes) of these waterways. However, with the implementation of standard erosion and sedimentation mitigation measures the impact would be reduced to low.

Groundwater

Risks to groundwater as a result of the amendments and refinements are summarised in Table 6-41.

Table 6-41 Potential risks to groundwater during construction

Amendment	Impact
Identification of potential areas where controlled blasting may be required	Vibration impacts from controlled blasting activities could potentially loosen silt/sand/rock particles and chemical precipitates lining fractures which can increase turbidity of groundwater. In addition, the use of nitrates (eg ammonium nitrate) in blasting operations could leach into groundwater and impact groundwater quality. Blasting activities could change existing groundwater flow pathways by generating new fractures in previously intact rock, dilating existing fractures and/or promote rock slip along existing joints/fracture surfaces. An additional mitigation measure has been proposed to minimise impacts as a result of blasting.
Additional telecommunications connections to existing substations	Earthworks for the installation of the telecommunications connections (between 0.8 m and 3 m depths) have the potential to intercept groundwater and therefore depending on the depth of the trench and level of groundwater, may require temporary dewatering (during the time the earthworks are carried out) to provide a dry excavation for cable installation. It should be noted that excavation of the trenches for the additional telecommunications connections to existing substations are expected to be undertaken progressively, in order to minimise exposure time, progressing in daily stages (ie approximately 20 m/day). Refer to Chapter 3 (Description of the amended project) for anticipated length of telecommunications connections to existing substations. Strahler 1st and 2nd order streams occur within the Gadara Road compound (C19) however it is unlikely these waterways function as natural streams. The Gullen Range stream crosses a Strahler 1st order stream and is identified as having a higher potential groundwater dependent ecosystem (GDE). Drawdowns from dewatering activities have the potential to reduce groundwater availability for surrounding GDEs and groundwater users Drawdowns from dewatering activities have the potential to reduce groundwater availability for surrounding GDEs and groundwater users. However, any excavation works are likely to be temporary and only open for a short period which would limit the volumes required to be dewatered and therefore limit any potential impact to GDEs. Given the limited nature and short term duration of dewatering activities the level of anticipated impacts is expected to be low. Excavation of the trenches for the additional telecommunications connections to existing substations are expected to be undertaken as a moving system aimed at minimising exposure time, progressing in daily stages. Dewatering along sections of the telecommunications connections alignments would be short in duration. After cessation of dewatering as the excavation progresses, the water table is expected to recover to original levels rapidly resulting in no long-term impacts. During construction of the telecommunications connections, construction dewatering would be temporary, of low impact and would not prevent the long-term viability of the potentially affected GDE or water supply work. With the implementation of the mitigation measures presented in Section 6.11.3, any groundwater impacts would be managed.
Use of approved water sources	As assessed in the EIS, groundwater impacts from purchasing and using existing groundwater allocations are expected to be negligible under the assumption that the existing WALs and licensed extraction volumes have already been evaluated and deemed to be acceptable against the NSW Aquifer Interference Policy during the application process.

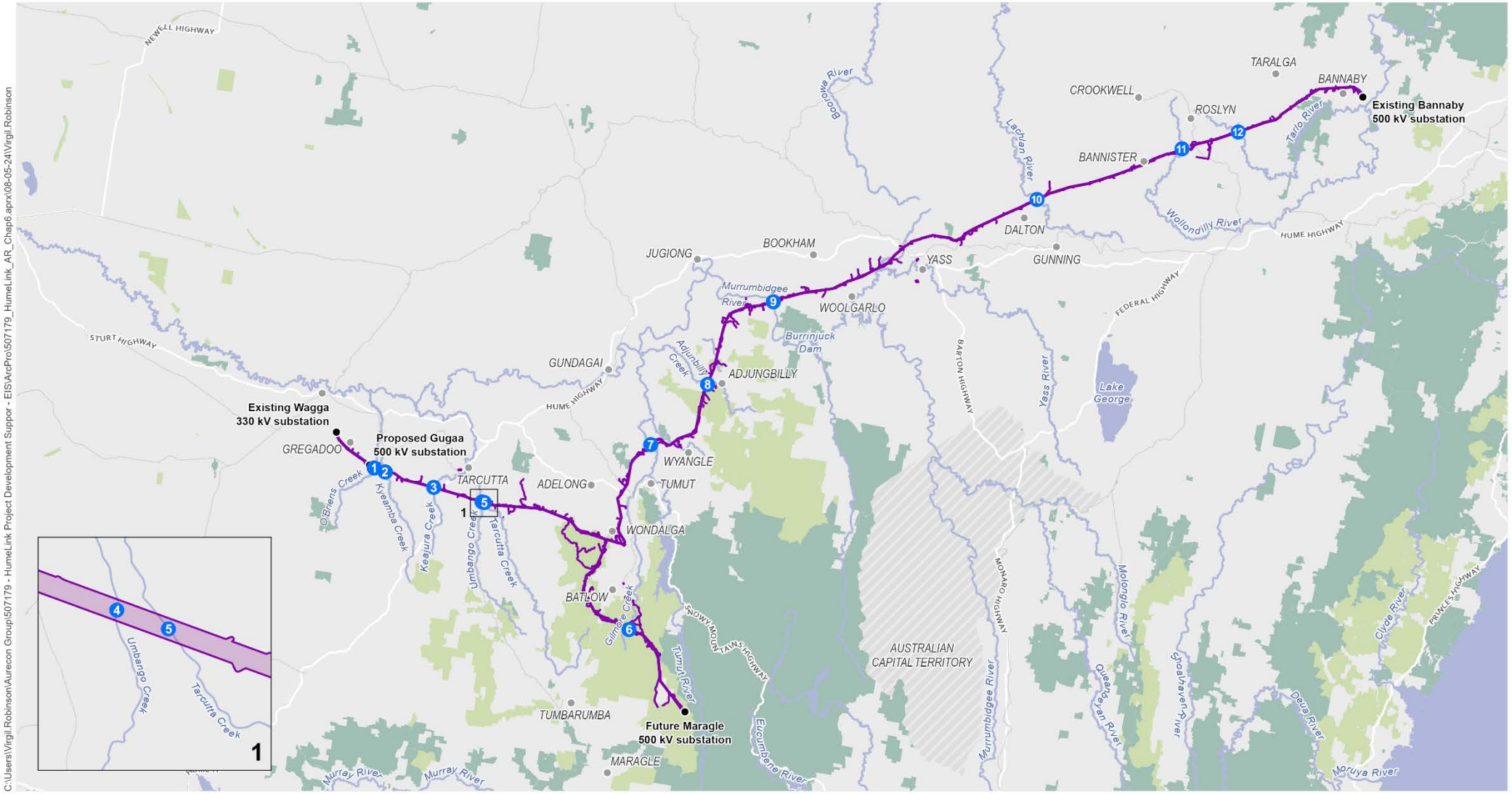

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FIGURE 6-12: Major waterway crossings within the amended project footprint

6.11.2.2. Operational impacts

The amended project involves changes to the transmission line corridor in some locations (including the Green Hills corridor amendment) as well as nomination of additional access tracks/waterway crossings that may be retained during operation for maintenance activities. Where permanent access tracks are retained within surface water catchments, more specifically ones that intersect waterways, there is a greater potential for increased local runoff. Increased runoff during wet weather events may increase the risk of erosion and sedimentation, Despite the increase in the number of operational access tracks compared to the EIS, the overall potential operational impacts of the amended project are generally consistent with the impacts described in Chapter 17 (Surface water and groundwater quality) of the EIS.

6.11.3. Updated mitigation measures

The approach to avoidance/minimisation and management of surface water and groundwater quality impacts remains generally consistent with the approach provided in Chapter 17 (Surface water and groundwater quality) of the EIS. Mitigation measures SW2, SW4 and SW5 have been updated to manage or minimise impacts on potential waterfront land areas, purchasing water allocations and groundwater dewatering. A new mitigation measure (SW6) has been included to manage impacts associated with controlled blasting on surface and groundwater users. Updates to mitigation measures are shown in **green** and ~~**strikethrough**~~ in Table 6-42. The consolidated list of mitigation measures for the amended project is provided in Appendix B (Updated mitigation measures).

Table 6-42 Summary of revised and new surface water and groundwater mitigation measures

Reference	Impact	Mitigation measures	Timing	Relevant location
SW2	Water quality and geomorphology	~~**Design**~~ **Consideration** of scour protection will be included for any infrastructure that is within a waterway ~~**channel**~~. The design will incorporate features that minimise impact on flow conditions and natural functioning of the waterway, where ~~**possible**~~ **feasible and reasonable**. For work within or near waterways consider and adhere to the following guidelines • ~~**Guidelines for controlled activities (Riparian corridors (DPE, 2022c) and Watercourse crossings (DPE, 2022b))**~~ • ***Guidelines for Controlled Activity - In-stream works*** **(DPE, 2022f)** • ***Guidelines for Controlled Activity - Watercourse crossings*** **(DPE, 2022e)** • *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (DPI, 2003) • *Policy and Guidelines for Fish Habitat Conservation and Management* (DPI, 2013).	Detailed design and construction	Waterways
SW4	Water supply	Water supply ~~**options and**~~ management will be undertaken in accordance with agreements between the construction contractors**, relevant landowners,** and relevant water users and suppliers. **Groundwater and surface water allocations purchased from existing registered bores/users must be extracted in accordance with the conditions stated in the associated Water Access Licences(s) (WAL(s)) and Water Supply Works approval(s).**	Detailed design and construction	All locations
SW5	Groundwater flow paths, levels and users	Alternative construction methodologies will be investigated and implemented as required to minimise impacts to **groundwater dependent ecosystems (**GDEs**)** and registered groundwater bores, if identified to be directly impacted during detailed design. Make good provisions will need to be made to the groundwater user(s) for bores that will be affected **in line with the minimal impact criteria listed within the NSW Aquifer Interference Policy**. **Where groundwater dewatering is required, the following will be conducted:** • **dewatering assessment (including dewatering volume estimates)** • **dewatering procedures will be included in the Soil and Water Management Plan (SWMP) in line with the minimal impact criteria listed within the NSW Aquifer Interference Policy, relevant water sharing plans (WSPs) and licencing requirements where relevant** • **Water Supply Works Approval (where needed)** • **Water Access Licence (WAL) (if dewatering volumes exceed 3 ML/year).**	Detailed design and construction	All locations

Reference	Impact	Mitigation measures	Timing	Relevant location
SW6	Surface water and groundwater	Where controlled blasting is required, a suitably qualified blasting specialist will be engaged to carry out a detailed blasting assessment and trial blasts (if required) to determine blasting design and site-specific parameters. The blasting assessment should identify measures to limit vibrations to the recommended "safe" levels (defined in *AS 2187.2-2006 Explosives - Storage and use*), limit rock mass damage, avoid "over-blasting" and consider and mitigate potential impacts to: • groundwater dependent ecosystems • groundwater users • surface water bodies.	Detailed design and construction	Controlled blasting locations

6.12. Hydrology and flooding

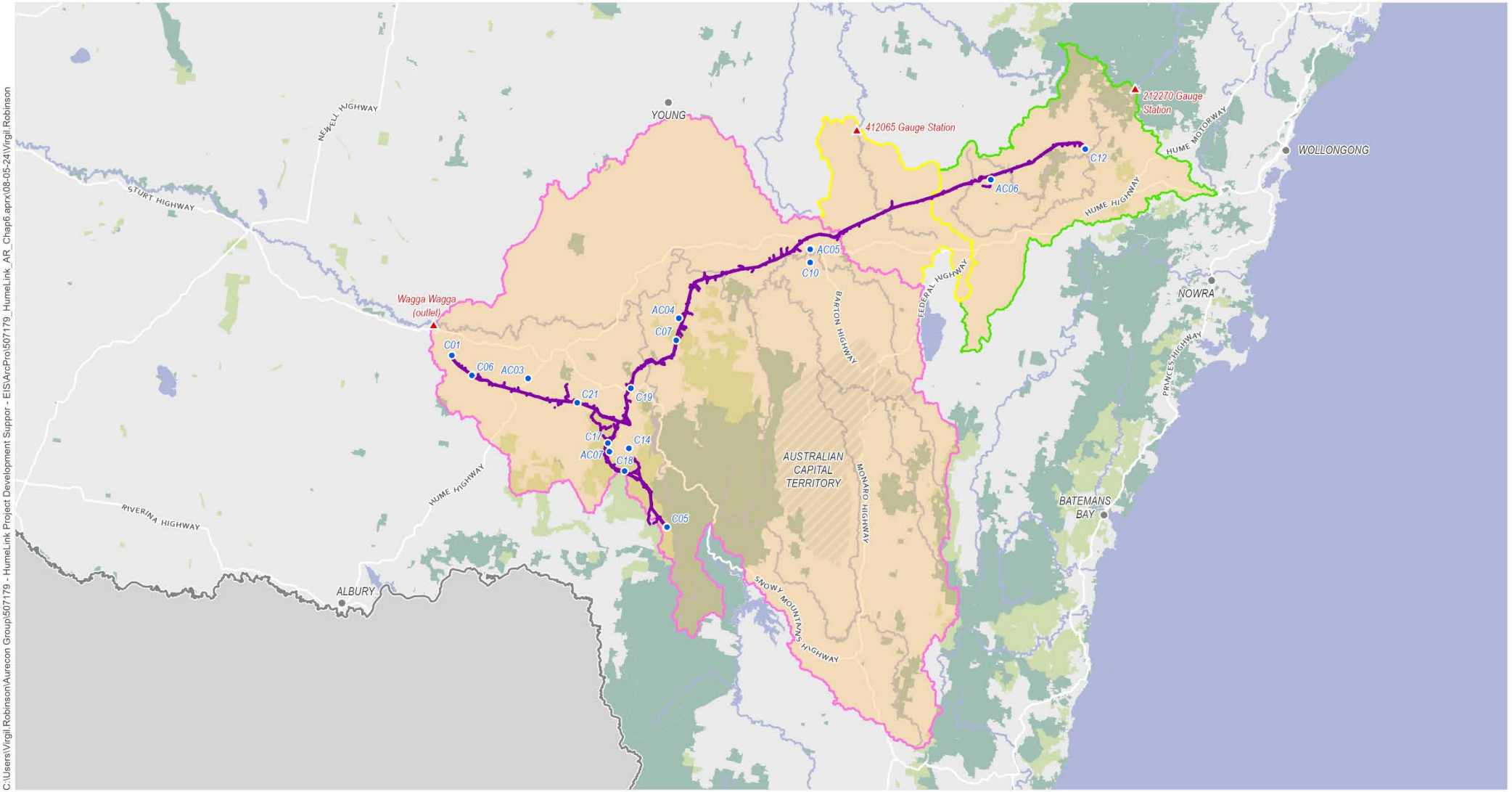
6.12.1. Approach to assessment

Technical Report 11 – Hydrology and Flooding Impact Assessment Addendum and a supplementary flooding report on the proposed Gugaa 500 kV substation (Lyall & Associates, 2023) has been prepared to consider the potential hydrology and flooding impacts from the proposed amendments and refinements of the project.

There has been no change to the legislative and policy context presented in *Technical Report 11 – Hydrology and Flooding Impact Assessment* prepared for the EIS.

The assessment of the amendments and refinements has been prepared largely in accordance with the assessment approach and methodology outlined within *Technical Report 11 – Hydrology and Flooding Impact Assessment* prepared for the EIS. This included updated local and regional hydraulic flood modelling for amended or new construction compounds and combined accommodation facilities and construction compound locations with the potential to interact with flooding. The flood modelling assessments at construction compound locations was carried out for the 5% annual exceedance probability (AEP) event and for the combined accommodation facilities and construction compound locations it was carried out for the 2% AEP flood event, in accordance with the flood immunity criteria adopted in the EIS. Desktop assessment of flood risk was carried out for other amendments and refinements including:

- new and changed construction compounds and worker accommodation facilities
- the modified layout of the proposed Gugaa 500 kV substation
- the amended transmission line corridor
- nominated access tracks.



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-13: Study area and primary catchment extents

6.12.2. Assessment of amendments and refinements

6.12.2.1. Construction impacts

The assessment of flood impacts during construction can occur as:

- potential impacts on flood behaviour due to construction activities
- potential impacts of flooding on construction activities.

Both types of impacts are expected where construction activities are located within the flood extent of major waterways. Each new or amended construction compound and combined worker accommodation facility and construction compound has been assessed for each type of impact on a site-by-site basis.

At a local scale, there is a risk of scour and erosion from drainage and flooding. This may be caused by construction activities (eg topsoil removal and waterway crossing for access tracks) and/or by flooding and drainage that then impacts on the construction activities. The risk of scour and erosion would occur across exposed soil and unsealed surfaces where drainage and flood waters concentrate, resulting in loss of soil material, potentially undermining any foundations, and eroding temporary roads. Appropriate scour protection, and sediment and erosion control management planning need to be considered to avoid or minimise any potential flood impact or changes in flood characteristics.

The access tracks which cross or are near waterways are more likely to impact flooding. No flood immunity requirements are currently considered necessary for the access tracks. Therefore, these access tracks can be developed at existing grade and cross waterways at low depths with suitable cross drainage to minimise the impacts on flood behaviour. Impacts on flooding due to the operation and use of access tracks would be minimal and localised. Most new access tracks which cross waterways traverse minor order waterways and as such would have limited to no discernible impact on flooding. All crossings are in remote locations with no known sensitive infrastructure nearby that would be impacted by the changes in flood behaviour. Overall, it is anticipated that the new access tracks would only have a minor to negligible impact on flooding.

The resulting impacts from and on flooding is considered to generally be minor or low risk and can be managed through proper implementation of the recommended management measures.

Impact of construction activities on flooding

Construction activities near waterways could divert overland flows impacting on flood behaviour and possibly resulting in flood impacts to adjacent areas.

Construction activities along the Green Hills route alignment would be localised to each transmission line structure. Activities would predominantly include stockpiling and excavations up to five metres deep for foundation installation, followed by backfilling upon completion. These activities are expected to last approximately four weeks per site, a duration considered too short to pose a risk on flooding. Any flood risks at a local flooding scale during this period would be managed and incorporated into the Construction Environmental Management Plan (CEMP), ensuring minimal impact.

Excavations during construction for the proposed Gugaa 500 kV substation would be relatively minimal. Excavation activities would include levelling around the individual structure foundations, drainage and grading. Overall, changes to local area flood characteristics would likely be minor and localised.

Access tracks were not explicitly modelled during construction due to the scale and definition compared to the regional hydraulic flood model. Should the access roads require earthworks, the resultant impact on flooding would be considered negligible given the remote location of the access roads with no adjacent development, and their width. However, appropriate local drainage design would be required to manage any local flood impacts on the access road infrastructure.

Areas at risk of flooding, including the construction compound and combined worker accommodation facility and construction compound sites are summarised in Table 6-43. Refer to *Technical Report 11 – Hydrology and Flooding Impact Assessment Addendum* for Figure 6-1 to Figure 6-9 which show the existing 5% AEP peak flood level for the sites listed in Table 6-43.

Table 6-43 Summary of construction compounds and combined worker accommodation facilities and compound impacts on local and regional flooding

Site	Impact of construction on flooding
Amended Gregadoo Road compound (C06)	Any filling for establishment of this construction compound and/or construction activities along the northern and the eastern extents of this site could impact local flooding due to presence of an overland flow path in this location. This impact would be mitigated through the implementation of local drains and channels in this area which can serve as effective measures to manage these potential flood impacts. There is no risk of impacts on regional flooding resulting from this construction compound.
Amended Honeysuckle Road compound (C07)	This construction compound and the proposed construction activities at this site would not have an impact on local flooding as the site is located on high ground. Any precipitation that does fall on the site can be readily managed via site drainage measures. Therefore, the construction compound is not expected to impact the local flooding characteristics. There is no risk of impacts on regional flooding resulting from this construction compound.
Amended Bannaby 500 kV substation compound (C12)	Local flood modelling at the new construction compound area indicated two shallow overland flow paths, one in the northern portion and one in the southern portion, conveying localised surface runoff from west to east in a 5% AEP event. There is potential for construction activities along these flow paths to result in minor local flooding. As these overland flow paths are minor drainage lines, they can be managed on site with an appropriate stormwater management plan. There is no risk of impacts on regional flooding resulting from this construction compound.
Ardrossan Headquarters Road compound (C17)	The construction compound is outside the Germans Creek flood risk area, which is located 90 m from the compound. However, due to minor overland flows within the construction compound, there is minimal risk for local flooding to occur from construction activities. This can be managed by the site stormwater management plan. Construction activities are not expected to impact local flooding behaviour. There is no risk of impacts on regional flooding resulting from this construction compound.
Gadara Road compound (C19)	This construction compound has a shallow overland flow path conveying localised surface runoff through the construction compound in a 5% AEP event. Maintaining construction activities outside this overland flow path would result in no flood impacts. There is no risk of impacts on regional flooding from Sandy Creek resulting from this construction compound. Sandy Creek is located approximately 300 to 400 m from the site.
Snubba Road compound (C18), Ellerslie Road compound (C21)	These construction compounds are not at risk of local or regional flooding from construction activities.

Site	Impact of construction on flooding
Adjungbilly accommodation facility and compound (AC04)	Based on the modelled 2% AEP event, any earthwork filling or civil structures proposed at this combined worker accommodation facility and construction compound has the potential to result in local flooding. Given the size of the site and flood extent, any potential flood impacts within the site would only occur if development is proposed in areas identified as having flood risk. If development is not proposed in flood risk areas, no impact to operation would be expected. However, if development encroaches or crosses areas of flood risk, this may influence earthwork levels, areas proposed for pedestrian movements and site accessibility. Ways to mitigate these potential impacts include stormwater infrastructure and avoidance of siting project infrastructure in high risk areas. There is no risk of impacts on regional flooding resulting from this combined worker accommodation facility and construction compound.
Yass accommodation facility and compound (AC05)	There is potential for this combined worker accommodation facility and construction compound to experience local flooding from Bango Creek in the 2% AEP event, which is located 15 m from the site. Any earthworks or civil structures along the western and southern boundaries are expected to result in impacts on local flooding that will be managed within the site. There is no risk of impacts on regional flooding from the Yass River resulting from this combined worker accommodation facility and construction compound.
Crookwell accommodation facility and compound (AC06)	The local flood modelling indicated that the site is subject to localised flooding. An overland flow path conveying localised surface runoff flows through the middle of the site in a 2% AEP event and divides the site isolating northern and southern flood free areas. Any earthworks or civil structures within the flood prone areas (ie the middle of the site) are expected to result in local flooding. There is no risk of impacts on regional flooding resulting from this combined worker accommodation facility and construction compound.
Tarcutta accommodation facility and compound (AC03), Green Hills accommodation facility and compound (AC07)	These combined worker accommodation facilities and construction compounds are not at risk of local or regional flooding from construction activities.

Impact of flooding on construction activities

Flooding has the potential to impact construction activities including the construction of the proposed Gugaa 500 kV substation, transmission line structures, access track work, and modification of existing substations. Potential flooding impacts are present where work is proposed in flood prone areas. During construction, stockpiled spoil, topsoil, materials, equipment and machinery have the potential to be washed away or scoured out by overland flows in a flood event, particularly if located near waterways and drainage lines. Excavations could potentially become filled with flood water, requiring dewatering, and embankments may become unstable. These site-based risks would be managed through a CEMP that would outline practices and risk management measures to mitigate site specific risks from flooding.

As summarised in Table 6-44, flood modelling assessments were carried out for the 5% AEP event at the amended construction compounds and for the 2% AEP event at the amended combined worker accommodation facilities and construction compounds in accordance with the flood immunity criteria adopted for the EIS.

Table 6-44 provides a summary of the flooding impacts at the proposed construction compounds and worker accommodation facilities. Refer to *Technical Report 11 – Hydrology and Flooding Impact Assessment Addendum* for Figure 6-9 to Figure 6-16 which show the existing 5% AEP peak flood depth for the sites listed in Table 6-44.

Table 6-44 Summary of local and regional flooding on construction activities at construction compounds and worker accommodation facilities

Site	Impact of flooding on construction
Amended Gregadoo Road compound (C06)	This construction compound site would experience minor local flooding in the northern portion of the compound in a 5% AEP event from shallow sheet flow. In contrast, the southern portion of the construction compound has some flood free area to the west. The majority of the flood extent observed for the construction compound is classified as generally safe for people, vehicles and buildings. Therefore, as per the EIS, this risk would be managed through an appropriately designed construction compound layout. There is no risk of regional flooding impacts at this construction compound.
Amended Bannaby 500 kV substation compound (C12)	The additional compound area to the north-west of the existing Bannaby 500 kV substation is predicted to have some minor impact from overland flow paths flowing west to east within the observed 5% AEP flood event. There are no changes to the flooding and drainage risk management are proposed for the areas previously assessed in the EIS. The majority of the flood extent observed for the construction compound is classified as generally safe for people, vehicles and buildings. To limit impacts on construction activities, this flood risk would be managed through local drainage. There would be no risk of regional flooding at this construction compound.
Snubba Road compound (C18)	The construction compound may be impacted by minor overland flow but this is unlikely to impact construction activities at the local catchment level. The risk of overland flow can be managed by maintaining local drainage. This construction compound is located on high ground and not at risk of regional flooding in a 1% AEP event.
Gadara Road compound (C19)	The construction compound is at risk of local flooding in the 5% AEP event. An overland flow path has the potential to affect all construction activities planned within the extent of the flow path. To manage potential impacts, there is need for a drainage easement through the site to maintain the existing drainage behaviour or a stormwater management plan to manage the potential impacts. These management measures would be considered further during ongoing design development. There is no risk of regional flooding predicted at this construction compound.
Ellerslie Road compound (C21)	The construction compound is at risk of minor local flooding along the northern boundary which could impact construction activities in this area. To minimise the impact from local flooding, any construction activities along the northern boundary should be avoided. There would be no risk of regional flooding at this construction compound.
Amended Honeysuckle Road compound (C07), Ardrossan Headquarters Road compound (C17)	These construction compound sites are not at risk of local or regional flooding.
Tarcutta accommodation facility and compound (AC03)	Local catchments to the south of Mates Gully Road were investigated for local flood risk. Based on the expected magnitude of runoff and the limited drainage information available at this stage, it was determined that impacts to construction activities at the combined worker accommodation facility and construction compound would be minor and manageable via site drainage management. There would be no risk of regional flooding at this site.
Adjungbilly accommodation facility and compound (AC04)	This combined worker accommodation facility and construction compound is subjected to localised overland flooding via an overland flow path in the 2% AEP flood event. There are also multiple drainage lines along the northern side of the main overland flow path and one along the southern boundary. Construction activities and people living at the combined worker accommodation facility and construction compound have the potential to be impacted. The majority of the flood extent observed for the site is classified as generally safe for people and vehicles, however there is an existing reservoir at the western bounding which is classified as unsafe for vehicles, children and the elderly. As per mitigation measure HF3 and to avoid and/or minimise impacts, flood impacts would be considered during development of the site layout design. There would be no risk of regional flooding at this site.

Site	Impact of flooding on construction
Yass accommodation facility and compound (AC05)	Flood mapping indicates that the site would be inundated along the north-western and southern boundaries in the 2% AEP flood event due to the flooding of Bango Creek which is located 15 m from the site. This could impact on compound activities and workers residing at the Yass accommodation facility and compound (AC05) if no mitigation is applied. As per mitigation measure HF3 and to avoid and/or minimise impacts, flood impacts would be considered during development of the site layout design. There would be no risk of regional flooding at this site.
Crookwell accommodation facility and compound (AC06)	An overland flow path traverses the site, dividing the site and isolating areas within the combined worker accommodation facility and construction compound in the 2% AEP event. This has the potential to impact aspects such as the site layout and area available for construction activities. Given that this site will also be used as a worker accommodation facility, internal access and emergency egress is critical to consider as part of site planning. As per mitigation measure HF3 and to avoid and/or minimise impacts, flood impacts would be considered during development of the site layout design. There would be no risk of regional flooding at this site.
Green Hills accommodation facility and compound (AC07)	This combined worker accommodation facility and construction compound is not at risk of local or regional flooding.

6.12.2.2. Operational impacts

Impact of operations on flooding

The amended project includes changes to the transmission line corridor including the Green Hills corridor amendment. Flooding is unlikely to be impacted by the changes to the transmission line corridor for the amended project due to the form and height of the transmission line structures.

The supplementary flooding report on the proposed Gugaa 500 kV substation (Lyall & Associates, 2023) considered the impact of the modified layout of the proposed Gugaa 500 kV substation as per the amended project on flooding. The flood investigation determined that as a result of the amendments to Gugaa 500 kV substation, the flood behaviour on the wider O'Briens Creek floodplain remains unchanged from the EIS. Therefore, the impacts described below for the proposed Gugaa 500 kV substation are based on the nature of flooding in the vicinity of the proposed substation. Based on observed flood behaviour, potential impacts due to the revised layout of the Gugaa 500 kV substation include:

- the potential obstruction of two existing overland flow paths that originate from the south-western corner of the proposed substation
- a concentration of flow in the north-western corner of the small (west) and large (east) elevated bench area that further increases depth and velocities in the areas downstream
- a minor increase in flooding to privately owned land that is located to the north of the site for the 1% AEP event
- a minor increase in depth and velocity is observed in the flow over Livingstone Gully Road adjacent to the north-eastern corner of the substation during the 1% AEP.

Further refinement of the drainage works would be considered during further detailed design in order to reduce these impacts.

Impact of flooding on operations

The amended project includes the preferred western route through Green Hills State Forest. The new 32.5 km route extends from Wondalga through the Green Hills State Forest before travelling to the west and south of Batlow and connecting to the EIS project transmission line corridor in Bago State Forest. The assessment of the amended transmission line route identified four new waterway crossings, compared with three waterway crossings presented in the EIS.

The flood risk to the transmission line structures and access tracks within the project footprint was informed by flood modelling in the 1% AEP event.

Flooding is unlikely to impact the operation of the transmission line due to the transmission line structures form and height.

The permanent access tracks which cross or are near waterways may be impacted by floods. This would present the need for regular maintenance to monitor scour risk and the condition of drainage infrastructure.

The modified layout of the proposed Gugaa 500 kV substation has the potential to obstruct two overland flow paths that discharge into O'Briens Creek, east of the substation. This obstruction could result in the following flood-related impacts on the operation of the proposed substation:

- The proposed substation would result in a slight increase in water levels, potentially causing additional overtopping of Livingstone Gully Road to the north-east of the substation. This could have potential implications for accessing the substation via Gregadoo East Road and Livingstone Gully Road. Nevertheless, this increase would be limited to 0.04 metres in the 1% AEP flood event and is considered minor given the existing flooding impacts during a flood event at this location.
- The access road (west entrance to the large, elevated bench) would be affected by an increase in flood level (up to 420 millimetres) in the 1% AEP flood event, which may limit access to the substation during a 1% AEP flood event.
- In the Probable Maximum Flood (PMF) event, the access road to the substation would be affected by a significant increase in water level (up to 950 millimetres). During this event, the flood extent would inundate the north-western corner of the large, elevated bench to a maximum depth of approximately 0.5 metres. No impacts to the operation of the substation are expected, as the impacts are on surrounding areas and the bench has been designed to be above the PMF flood level.
- The majority of the flood extent observed for the proposed Gugaa 500 kV substation is classified as generally safe for people, vehicles and buildings.

Through the implementation of mitigation measure HF5, the impact on flooding and drainage at the proposed Gugaa 500 kV substation would be managed.

6.12.3. Updated mitigation measures

The approach to avoidance/minimisation and management of hydrology and flooding impacts remains generally consistent with the description provided in Chapter 18 (Hydrology and flooding) of the EIS. All hydrology and flooding mitigation measures except HF2 (which applies to access tracks) have been revised to include the AEP events for which the mitigation measure applies, with locations updated to reflect the relevant amended project locations where necessary. Updated mitigation measures are shown in **green** and ~~**strikethrough**~~ in Table 6-45. The consolidated list of mitigation measures for the amended project is provided in Appendix B (Updated mitigation measures).

Table 6-45 Summary of revised hydrology and flooding mitigation measures

Reference	Impact	Mitigation measures	Timing	Relevant location
HF1	Drainage design and stormwater management	Suitable on-site drainage design and stormwater management strategies and plans will be implemented to limit adverse flood impacts on surrounding properties during construction.	Detailed design and construction	All construction compounds **and combined worker accommodation facilities and construction compounds**
HF3	Impact on flooding at **all construction compounds and combined worker accommodation facilities and construction compounds** ~~**the Snowy Mountains Highway construction compound (C02)**~~	**Where possible,** overland flow **paths** up to the 5% AEP event **for construction compounds and 2% AEP for combined worker accommodation facilities and construction compounds** ~~**across the southern extent of the Snowy Mountains Highway compound (C02) is**~~ **are** to remain unobstructed from bulk filling, site infrastructure and/or stockpiling. Selective placement of sensitive or vulnerable infrastructure (eg electrical equipment, buildings, machinery, stockpiles, pedestrianised areas etc) will be considered in flood prone areas. **Where bulk filling of flood prone land is required, a flood impact assessment is required to demonstrate the impact of proposed works with consideration of mitigation measures to minimise any downstream impacts.**	Detailed design	**All construction compounds and combined worker accommodation facilities and construction compounds** ~~**Snowy Mountains Highway compound (C02)**~~

Reference	Impact	Mitigation measures	Timing	Relevant location
HF4	Impact on flooding and drainage at construction compounds**, combined worker accommodation facilities and construction compounds** and Bannaby 500 kV substation	**Where possible,** existing drainage and overland flowpaths will be maintained at ~~**the Maragle substation compound (C05), Gregadoo Road compound (C06)**~~ **construction compounds, combined worker accommodation facilities and construction compounds** and Bannaby 500 kV substation. Where filling is required, suitable drainage design and stormwater management strategies and plans will be implemented to limit adverse flood impacts on surrounding properties. Selective placement of sensitive or vulnerable infrastructure (eg electrical equipment, buildings, machinery, stockpiles, pedestrianised areas etc) will be allocated to areas away from drainage lines. On site detention will be incorporated where increases in site stormwater discharges exceed predevelopment flows, and will be designed in accordance with ~~**the Blue Book**~~ ***Managing Urban Stormwater – Soils and Construction, Volume 1*** (Landcom, 2004)**, and *Volumes 2A* (DECC, 2008a) and *2C* (DECC, 2008b), commonly referred to as the 'Blue Book'**.	Detailed design and construction	Maragle substation compound (C05), ~~**and**~~ **Amended** Gregadoo Road compound (C06)**,** ~~**and**~~ Bannaby 500 kV substation**, Amended Bannaby 500 kV substation compound (C12), Gadara Road compound (C19), Adjungbilly accommodation facility and compound (AC04), Yass accommodation facility and compound (AC05), Crookwell accommodation facility and compound (AC06), Ardrossan Headquarters Road compound (C17), Ellerslie Road compound (C21).**
HF5	Impact on flooding and drainage at Gugaa 500 kV substation	Suitably sized cut-off drains and cross drainage culverts will be designed and constructed to maintain existing flood behaviour around and downstream of the **proposed Gugaa 500 kV** substation footprint**, unless otherwise approved by NSW Department of Planning, Housing and Infrastructure**.	Detailed design and construction	Proposed Gugaa 500 kV substation

6.13. Hazards and risks

6.13.1. Approach to assessment

Chapter 19 (Hazards and risks) of the EIS summarises the hazards and risk impact assessment approach and methodology for the project.

There has been no change to the legislative and policy context presented in the EIS. The assessment of hazards and risks have been prepared in accordance with the methodology outlined within the EIS.

Following further design development and consideration of the proposed VNI West project, the amended project includes the potential energisation of the transmission line between the existing Wagga 330 kV substation and the proposed Gugaa 500 kV substation at 500 kV (Wagga - Gugaa line). As the electric and magnetic field (EMF) assessment undertaken for the EIS only assessed energisation at 330 kV, the EMF assessment in this section was updated (remodelled) to reflect operating conditions of 500 kV for this section of the transmission line.

Technical Report 13 - Bushfire Risk Assessment Addendum has been prepared to consider the potential bushfire hazards and risks from the proposed amendments and refinements of the project. Additional tasks included field investigations in October 2023 to survey additional relevant areas within the amended project footprint, updated desktop mapping and updated desktop assessment of risks.

6.13.2. Assessment of amendments and refinements

The impacts from the project amendments and refinements on dangerous goods and hazardous materials and changes to emergency egress and evacuation routes remain consistent with the impacts described in the EIS.

6.13.2.1. Electric and Magnetic Fields

The amended project has been designed to reduce the levels of EMF generated from the transmission line and substation infrastructure and minimise EMF levels that people would encounter over long periods of time.

An updated assessment on the potential EMF levels from the transmission lines for the amended project has been carried out and EMF levels were compared to the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guideline Reference Levels.

The highest predicted electric fields, at the edge of the easements for the transmission line section between the proposed Gugaa 500 kV substation and existing Wagga 330 kV substation would range from 0.15 to 0.3 kilovolts per metre when it is operating at 330 kV and 0.25 to 0.4 kilovolts per metre when it is operating at 500 kV, which is three to six per cent and five to eight per cent of the ICNIRP General Public Guideline Level of five kilovolts per metre, respectively.

Table 6-46 highlights the magnetic fields that could be experienced at one metre above ground level under various operating scenarios from the operation of the Wagga – Gugaa line.

Table 6-46 Magnetic fields under different transmission line load conditions at the Wagga - Gugaa line

Load condition	Location	Percentage of the ICNIRP General Public Guideline Level
Typical conditions	Directly beneath the proposed – Wagga - Gugaa line	The highest predicted magnetic field is 5.9%
	At the edge of the easements	The highest predicted magnetic field is 1.2%
Normal peak load conditions (ie maximum current allowed during normal operation)	Directly beneath the proposed – Wagga - Gugaa line	The highest predicted magnetic field is 8.2%
	At the edge of the easements	The highest predicted magnetic field is 1.6%
Emergency conditions (ie when higher currents may briefly be allowed)	Directly beneath the proposed – Wagga - Gugaa line	The highest predicted magnetic field is 18%
	At the edge of the easements	The highest predicted magnetic field is 5.9%

Consistent with Chapter 19 (Hazards and risks) of the EIS, the revised layout and equipment for the proposed Gugaa 500 kV substation would be designed to ensure that EMF in accessible areas of the substation would comply with the ICNIRP Occupational Guideline Level. In addition, EMF levels outside the substation fence line would comply with the ICNIRP General Public Guideline Levels. In addition, the nearest sensitive receiver is located about 540 metres north of the proposed Gugaa 500 kV substation. Therefore, it is not expected that the proposed Gugaa 500 kV substation would result in any potential human health risks from EMF.

6.13.2.2. Bushfire risk

The assessment of bushfire risk considers:

- regional fire weather and climate risk
- Bush Fire Prone Lands (BFPL) (refer to Figure 6-14)
- vegetation
- slope
- access.

The assessment within Chapter 19 (Hazards and risk) of the EIS remains consistent for the amended project footprint, for the following bushfire risk:

- climate change
- historic fire occurrence
- bushfire ignition sources.

There is an additional 320 hectares in Category 1 BFPL within the amended project footprint, a change from the original 2,406 hectares of Category 1 BFPL presented in the EIS. Although the amended project includes some areas of additional BFPL including the Green Hills corridor amendment, the impacts on bushfire risk remain consistent with the EIS. This is because the transmission line has been conservatively classified as having the highest bushfire risk (of all the temporary or permanent components of the amended project) due to the extensive, dynamic and varying landscape encompassed within the transmission line corridor. Vegetation management within the transmission line easement would be applied uniformly across the entire amended project transmission line and would be managed in accordance with Transgrid's existing vegetation management standards. The easement widths proposed in the amended project are consistent with, or greater than, the easement widths identified in national standards *AS/NZS7000:2016 Overhead Line Design*.

The Green Hills corridor amendment is largely within Category 1 BFPL. Category 1 BFPL generally support the highest intensity bushfires and are considered the highest risk vegetation. Category 2 and 3 BFPL comprise lower risk vegetation. Additionally, the following construction compounds and worker accommodation facilities are located on BFPL:

- Yass accommodation facility and compound (AC05) (Category 3 BFPL)
- Tarcutta accommodation facility and compound (AC03) (Category 3 BFPL)
- Ardrossan Headquarters Road compound (C17) (Category 1 BFPL)
- Amended Gregadoo Road compound (C06) (Category 3 BFPL)
- Snubba Road compound (C18) (Category 1 BFPL)
- Amended Honeysuckle Road compound (C07) (Category 1 BFPL) (which was also assessed in the EIS).

Asset protection zones (APZs) are assessed for each bushfire survey area[5] in accordance with the *Planning for Bush Fire Protection: A guide for councils, planners, fire authorities and developers* (PBP) performance criteria and acceptable solutions (NSW RFS, 2019), refer to Table 6-47. Consistent with the EIS, APZs would be established from the earliest stages of construction and maintained throughout operation of the construction compounds and combined construction compound and accommodation facilities. APZs would minimise but not eliminate the risk of bushfire impacting assets. Refer to *Technical Report 13 – Bushfire Risk Assessment Addendum* for further details on APZ requirements at specific locations.

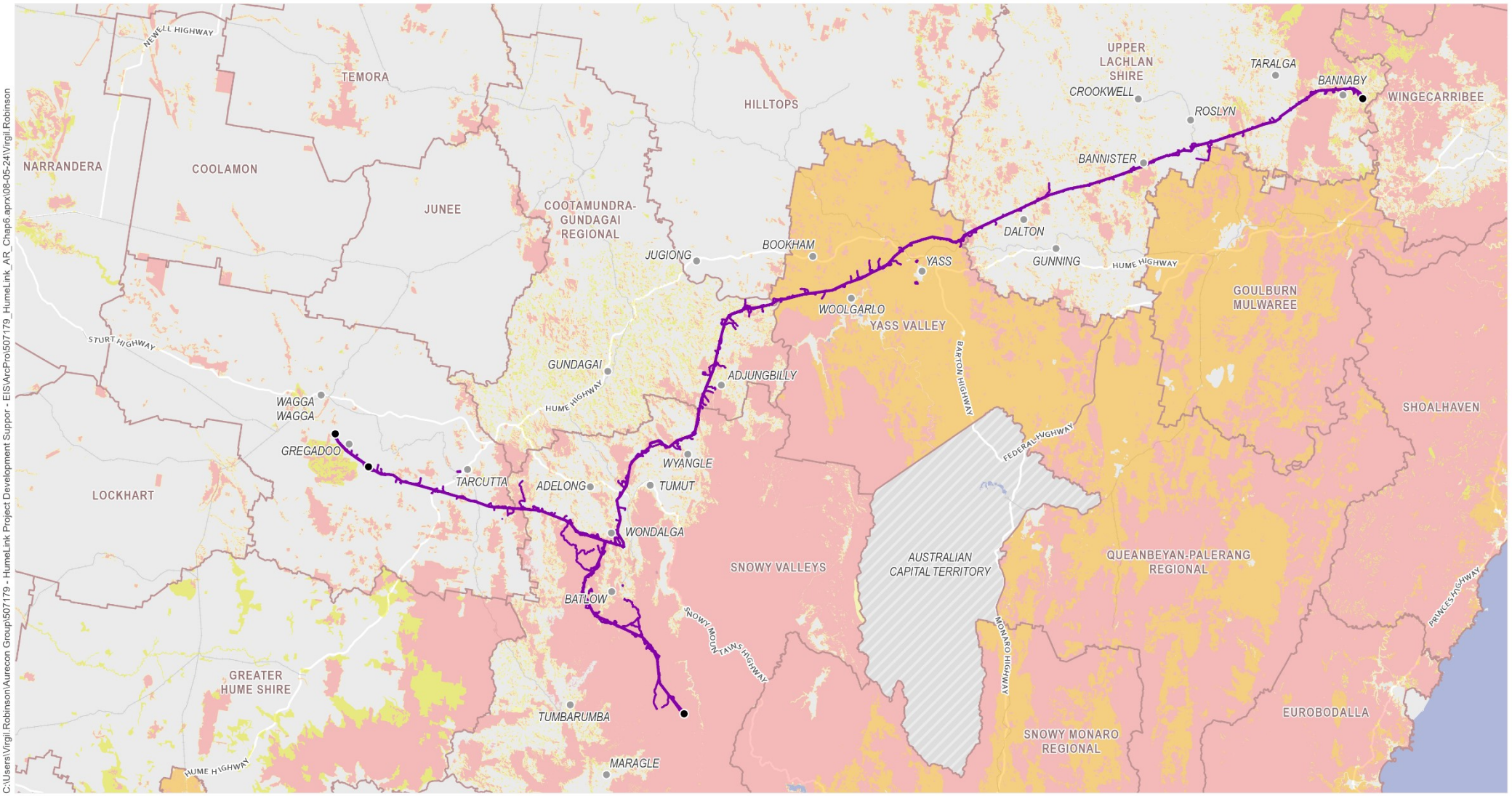
Table 6-47 Bushfire APZ requirements

Bushfire survey area	Direction	APZ
Crookwell accommodation facility and compound (AC06)	North	40 m
	South	36 m
	East	42 m
	West	93 m
Yass accommodation facility and compound (AC05)	North	40 m
	South	40 m
	East	36 m
	West	36 m
Gadara Road compound (C19)	North	10 m
	South	10 m
	East	10 m
	West	10 m
Green Hills accommodation facility and compound (AC07)	North	79 m
	South	93 m
	East	79 m
	West	79 m

[5] Bushfire survey areas include areas surveyed at ancillary facilities within the amended project footprint that are considered to experience exposure to bushfire risk during construction and operation.

Bushfire survey area	Direction	APZ
Tarcutta accommodation facility and compound (AC03)	North	40 m
	South	67 m
	East	40 m
	West	36 m
Amended Honeysuckle Road compound (C07)	North	10 m
	South	31 m
	East	10 m
	West	25 m
Ellerslie Road compound (C21)	North	10 m
	South	10 m
	East	17 m
	West	10 m
Ardrossan Headquarters Road compound (C17)	North	31 m
	South	25 m
	East	31 m
	West	31 m
Amended Gregadoo Road compound (C06)	North	10 m
	South	10 m
	East	10 m
	West	10 m
Adjungbilly accommodation facility and compound (AC04)	North	67 m
	South	79 m
	East	79 m
	West	79 m
Amended Bannaby substation compound (C12)	North	12 m
	South	13 m
	East	12 m
	West	10 m
Snubba Road compound (C18)	North	31 m
	South	31 m
	East	25 m
	West	25 m

The worker accommodation facilities (AC03, AC04, AC05, AC06, AC07), are classified as National Construction Code Class 3 buildings and Special Fire Protection Purpose developments, and therefore are subject to specific bushfire protection requirements. In accordance with the PBP (NSW RFS, 2019) primary and secondary access routes would be provided for locations with buildings where people may work or use for accommodation purposes. Adequate water supply is essential to put out unwanted spot ignitions and to provide potential water sources for firefighting agencies within bushfire survey areas. Appropriate water supply for firefighting and appropriate location of utilities are important mitigation measures of bushfire risk during construction. All combined worker accommodation facility and construction compounds comply with the PBP requirements for water supply and services. The worker accommodation facilities (AC05 and AC03) on BFPL must satisfy the aims and objectives outlined in PBP (NSW RFS, 2019) as they are situated on Category 3 land.



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Source: *Aurecon, Transgrid, NSW Rural Fire Service, Spatial Services (DCS), ESRI Basemap*

1:925,000

0 20 40km

Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-14: Bush Fire Prone Land

6.13.2.3. Aviation risks

No additional certified or non-certified aerodromes (aircraft landing areas or helicopter landing sites) were identified within three nautical miles (5.6 kilometres) of the amended project footprint. The amended project footprint does not create an additional impact to aviation safety and in some instances reduces the impact to some non-certified aerodromes. There would be no additional infringement of the obstacle limitation surface or the Procedures for Air Navigation Services - Aircraft Operations at Wagga Wagga Airport due to the amended project.

The amended project footprint has resulted in the following impact changes to non-certified landing areas:

- the refinement of the transmission line corridor at Wondalga has:
  - reduced the impacts to one aircraft landing area from major to minor as the narrowed footprint in this section is further west from the airstrip and there would likely be sufficient distance for pilots to conduct almost normal circuits in either direction
  - eliminated the impacts to one helicopter landing area previously assessed in the EIS to have a minor impact as the helicopter landing area is no longer in the amended project footprint.
- the Green Hills corridor amendment has:
  - eliminated the impacts to one aircraft landing area previously assessed in the EIS to have a minor impact
  - reduced the impacts to another aircraft landing area from major to moderate as the airstrip can still be used but would have some landing and take-off limitations.

Based on the location and aspect of the aircraft landing areas, two aircraft landing areas remain as either unusable or requiring significant modification to the layout or flight operations (ie major impact). These aircraft landing areas are located in the Snowy Valleys and Yass Valley LGAs and are either within the amended project footprint or in proximity (ie less than 400 metres away). Due to the number of airstrips in the area that may be close to the amended project footprint, an alternative site is likely to be available within a short distance and further away from the amended project footprint should an aircraft landing area be subject to major impacts.

Transgrid will continue to consult with landowners on potential impacts to private aircraft landing areas and minimise impacts where practicable during further detailed design.

For helicopter landing areas, helicopters are able to operate in proximity to trees, buildings and other structures, allowing a helicopter landing strip to be located closer to structures compared to landing areas used for fixed wing aircraft operations. All helicopter landing areas assessed are considered to have no impact.

As the amended project footprint is located within uncontrolled airspace, Civil Aviation Safety Authority (CASA) considers the use of helicopters for stringing transmission lines as a ‘normal operation’ as long as the activity is conducted in accordance with the Operations Manual approved by CASA. All helicopter operations would be undertaken in accordance with CASA’s requirements by appropriately trained and licensed helicopter pilots. A limited number of helicopters would likely be deployed at any time (approximately four helicopters in different locations along the amended project footprint) and with the implementation of the proposed mitigation measures (refer to Appendix B (Updated mitigation measures)) this would be unlikely to result in increased aviation safety risks.

Drone use

The proposed drone operations during construction would not have an impact on aviation activity due to the low altitude that the drones would be operating at. All drones would be operated in accordance with their approved operations manuals by CASA related to their authorisation to conduct the type of operation that they are certified for.

Where both helicopters and drones are used in the same area, both operations would be coordinated, by the construction contractors through daily briefings or via communication between each of the related operators.

In addition, the provision of details of the stringing or transmission line structure construction activities to Airservices Australia in accordance with mitigation measure HR8 that would alert other pilots operating the area of the drone and helicopter operations.

6.13.2.4. Gas pipelines risks

Preliminary Before You Dig Australia (BYDA) investigations confirmed that the amended project footprint intersects two APA Group gas pipelines associated with the Moomba to Sydney Pipeline System at Gadara Road, Gadara and at Dalton near Felled Timber Road. The BYDA investigations also identified a Jemena gas pipeline which is intersected by the amended project footprint at Cooks Hill Road, Bango. These gas pipelines were not identified during the EIS stage.

Whilst the transmission line crosses gas pipelines and other utilities, the transmission line structures could be micro-sited to avoid impacts to the utilities. The potential impacts on the gas pipelines would be confirmed during further detailed design in consultation with APA Group and Jemena. Refer to Section 6.5.3 for mitigation measure on the impact to utilities and services.

6.13.3. Updated mitigation measures

The approach to avoidance/minimisation and management of hazards and risks remains consistent with the description provided in Chapter 19 (Hazards and risk) of the EIS. Mitigation measure HR1 has been revised to reflect the changes to worker accommodation facilities in the amended project, HR2 has been removed because the telecommunications hut is no longer required for the amended project, and the timing for HR5 has been revised to remove the operation phase. During operation Transgrid uses a standing Bushfire Risk Management Plan (BRMP) for the entire network, site specific emergency plans and corporate emergency/crisis response mechanisms.

Mitigation measures HR6 and HR8 have been updated to include stakeholders that have been identified for the amended project. New mitigation measure HR14 provides for an EMF monitoring requirement to ensure compliance with EMF guidelines during operation of the project, and new mitigation measure HR15 provides for a static water supply at construction compounds and worker accommodation facilities to mitigate risk associated with bushfire. The updates are shown in **green** and ~~**strikethrough**~~ in Table 6-48. The consolidated list of mitigation measures for the amended project is provided in Appendix B (Updated mitigation measures).

Table 6-48 Summary of revised and new hazards and risks mitigation measures

Reference	Impact	Mitigation measures	Timing	Relevant location
HR1	Protection zones and landscaping	**Asset protection zones (**APZs**)** will be managed in accordance with *Planning for Bush Fire Protection: A guide for councils, planners, fire authorities and developers requirements* (NSW RFS, 2019) (PBP), and associated criteria.	Detailed design, construction and operation	Substations and project buildings within construction compounds and the temporary **worker** accommodation ~~**facility**~~ **facilities**
~~**HR3**~~	~~**Ancillary buildings**~~	~~**The final location of the telecommunications hut will need to be assessed with a visual inspection to confirm potential bushfire risk.**~~	~~**Detailed design**~~	~~**Telecommunications hut**~~
HR5	Bush Fire Emergency Management and Evacuation Plan (BFEMEP)	The project will be designed and constructed in accordance with a **Bush Fire Emergency Management and Evacuation Plan (**BFEMEP**)**. The BFEMEP will be prepared by a suitably qualified person and will include: • Bushfire Emergency Evacuation Plan • Bush Fire Risk Management Plan (BRMP) protocols during construction, considering activities during days with fire danger rating 'high' or greater • bushfire response and notification measures to report fires at the earliest opportunity • bushfire mitigation measures including maintaining **asset protection zones (**APZs**)** and mechanisms for the handling and use of any dangerous goods • bushfire risk induction and training for personnel, including risks and management measures associated with construction equipment and activities • fire reporting, emergency areas, on-site refuges, and evacuation procedures and is to be consistent with *Development Planning: A guide to developing a bush fire emergency management and evacuation plan* (NSW RFS, 2014). The BFEMEP will be consistent with relevant Australian standard and development plans and guides. For the Special Fire Protection Purpose (SFPP), the BFEMEP will include planning for the early relocation of occupants in the event of a potential bushfire or other emergency situation. A copy of the BFEMEP will be provided to the Local Emergency Management Committee for its information prior to occupation of the development.	Detailed design**,** **and** construction ~~**and operation**~~	All locations
HR6	Aviation safety	The detailed design of the transmission line structures with coordinates and elevations will be provided to relevant stakeholders (including Airservices Australia, Department of Defence**, Aerial Application Association of Australia, Forestry Corporation of NSW** and ALA owners along the transmission line route). The notification will be made as early as possible.	Detailed design	All locations

Reference	Impact	Mitigation measures	Timing	Relevant location
HR7	Aviation safety	Consultation with **Civil Aviation Safety Authority (**CASA**)** will be undertaken to confirm whether obstacle lighting and marking of the transmission line structures are required. The provision of markers on **transmission lines** ~~**cables**~~ and **transmission line** structures ~~**within three nautical miles (5.6 kilometres) of the final transmission line route**~~ will be considered with the appropriate stakeholders.	Detailed design and construction	Transmission line route between Wagga 330 kV substation and Gugaa 500 kV substation
HR8	Aviation safety	Approval to operate construction cranes that infringe the **obstacle limitation surface (**OLS**)** for Wagga Wagga Airport will be obtained in advance of the proposed activity **at the transmission line between Wagga 330 kV substation and Gugaa 500 kV substation**. Wagga Wagga Airport management **and Aerial Application Association of Australia** will be provided with details of the crane operations at least seven days prior to their commencement via the Notice to Airmen (NOTAM) procedure. **Details of potential stringing of transmission lines with helicopters and/or drones will be provided to Airservices Australia prior to commencement of stringing activities.**	Construction	~~**Transmission line route between Wagga 330 kV substation and Gugaa 500 kV substation**~~ **Transmission line**
HR14	**Electric and magnetic fields**	**Within 12 months of the commencement of operation, an EMF compliance report will be produced to ensure compliance with the following EMF design criteria:** • **Magnetic fields: 2,000 milligauss being the ICNIRP guideline 'Reference Level'** • **Electric fields: 9.1 kV per metre, ensuring compliance with the ICNIRP guideline 'Basic Restriction'.**	**Operation**	**All locations**
HR15	**Bushfire**	**A minimum of 20,000 litre static water supply for firefighting purpose will be provided for each construction compound and worker accommodation facility where no reticulated water is available in accordance with *Planning for Bush Fire Protection: A guide for councils, planners, fire authorities and developers* (NSW RFS, 2019).**	**Construction**	**Construction compounds and worker accommodation facilities**

6.14. Traffic, transport and access

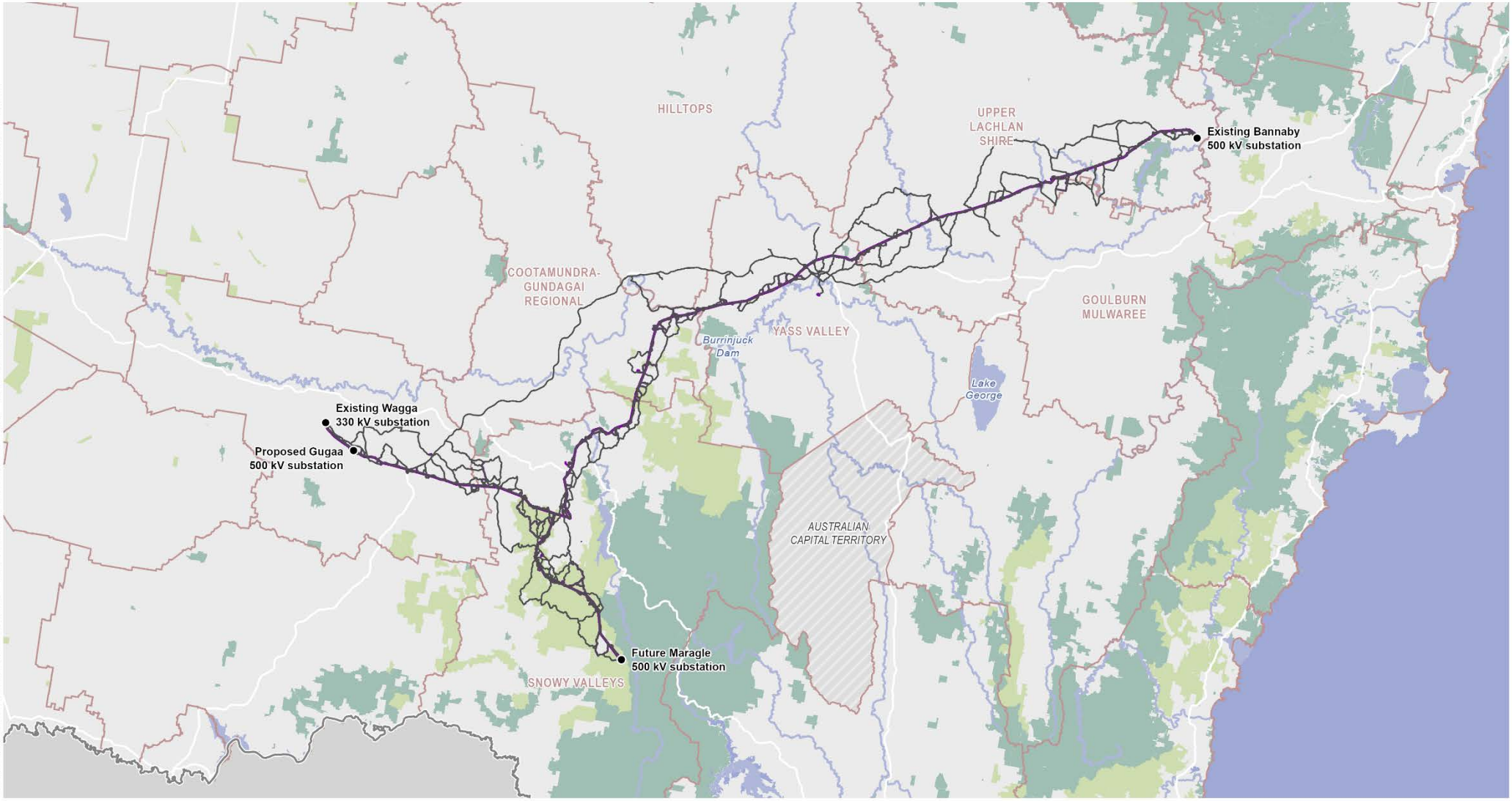
6.14.1. Approach to assessment

The traffic, transport and access impacts associated with the amended project, as well as the legislative and policy context and methodology for the assessment, is presented in *Technical Report 16 - Revised Traffic and Transport Impact Assessment*. As a result of changes to the project footprint and updates to the construction methodology in response to government agency feedback, the revised assessment includes:

- identifying indicative access routes using GIS analysis and defining the amended traffic study area (refer to Figure 6-15)
- identifying and qualitatively assessing existing transport conditions
- calculating worst-case traffic generation and distribution within the amended traffic study area as a result of construction of the amended project assuming all accommodation facilities and work site areas in use, including indicative heavy vehicle movements from existing extractive material locations and water supply sources
- assessing Level of Service on access routes within the amended traffic study area based on the worst-case traffic generated by the amended project
- reviewing the revised oversize and/or over mass (OSOM) report (Deugro, 2023 and RJA, 2021a and 2021b).

The GIS analysis identified indicative access routes as the shortest, most efficient routes between combined accommodation facilities and compounds or town centres and the construction compounds and work sites along the transmission line corridor. The roads providing access from indicative extractive material locations to the amended project have also been included in the amended traffic study area. The roads identified in this GIS analysis for the amended project formed the amended traffic study area and are considered representative of the roads that may be used to provide access to the amended project footprint and the surrounding existing road network. However, the construction contractors may choose alternative access routes during construction as a result of further detailed design and construction planning or operational changes to existing road conditions. The access route selection process flow chart (refer to Figure 4-2 of Technical Report 16 –Revised Traffic and Transport Impact Assessment) provides an outline of the method to be adopted for selecting the final construction access routes. The final access routes selected to be used during construction would be managed under the overarching Traffic and Transport Management Plan that will be prepared in consultation with local councils and Transport for NSW.

Technical Report 16 - Revised Traffic and Transport Impact Assessment includes an updated description of the existing environment for the traffic and transport assessment for the amended project.



Amended project footprint
State of Victoria
Local Government Area
Amended traffic study area - access routes
National park and reserve
State forest
Waterbody
Waterway
Major road
Substation

Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:1,100,000
0 20 40 km

Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-15: Amended traffic study area

6.14.2. Assessment of amended project

6.14.2.1. Construction impacts

During construction of the amended project, movement of construction vehicles would impact on the existing transport network. These vehicle movements would be associated with travel of construction workers, the delivery of construction materials and equipment and the removal of waste and spoil. These impacts have been assessed to account for amendments to the project, including changes to the transmission line corridor, changes to the number and location of worker accommodation facilities and construction compounds, and nomination of access tracks to support the construction and operation of the project.

Traffic generation

Based on the preliminary construction program, during the peak construction period, up to 65 work sites would be progressing concurrently including at transmission line structures, substations, worker accommodation facilities and construction compounds. These active work sites would be distributed across the amended project footprint and accessed from various roads within the amended traffic study area. Table 6-49 provides the vehicle movements estimated to be generated from each compound and combined worker accommodation facility and compound (as proposed in the amendment) during peak construction and accessing nearby roads within the amended traffic study area.

Table 6-49 Indicative vehicle movements during construction

Construction compound/ worker accommodation facility	Daily movement (vehicle movements per day in both directions of travel)				Peak hour movement (vehicle movements per day in both directions of travel)			
	Typical construction		Construction peak		Typical construction		Construction peak	
	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles
Construction compound								
Wagga 330 kV substation compound (C01)	60	70	120	140	10	15	25	30
Maragle 500 kV substation compound (C05)	70	105	195	285	10	10	20	25
Amended Gregadoo Road compound (C06)	85	140	230	340	10	15	20	30
Amended Honeysuckle Road compound (C07)	145	50	190	160	20	5	30	15
Yass substation compound (C10)	10	65	20	130	5	15	5	25
Amended Bannaby 500 kV substation compound (C12)	110	50	130	120	15	5	20	10
Amended Memorial Avenue compound (C14)	25	25	40	45	5	5	5	10
Ardrossan Headquarters Road compound (C17)	55	85	110	175	10	10	20	20
Snubba Road compound (C18)	55	85	100	155	10	10	10	15
Gadara Road compound (C19)	145	50	140	175	20	5	20	15
Ellerslie Road compound (C21)	55	85	100	150	10	10	10	15
Combined construction compound and worker accommodation facility								
Tarcutta accommodation facility and compound (AC03)	140	225	200	440	20	20	30	30
Adjungbilly accommodation facility and compound (AC04)	240	95	305	160	70	15	70	10
Yass accommodation facility and compound (AC05)	315	75	420	310	60	10	80	25
Crookwell accommodation facility and compound (AC06)	240	40	210	160	70	15	30	10
Green Hills accommodation facility and compound (AC07)	130	180	190	535	20	15	30	40

Traffic distribution

Heavy vehicle traffic would be distributed across the amended traffic study area. Heavy vehicle movements would largely be associated with deliveries to work sites or transporting waste construction material for disposal. Light vehicle traffic would mostly originate from the proposed worker accommodation facilities (as amended) and would be distributed from these locations to active work sites.

Roads adjacent to substation work sites and construction compounds (as amended) are expected to experience higher volumes of heavy vehicle traffic, due to the deliveries of materials to these locations for longer durations of the construction program than other work sites. These roads would also carry some light vehicles for workers travelling to and from construction compounds and substation work sites. However, within the amended traffic study area, 70 per cent of the routes are expected to be used for a short duration within the overall construction program (up to six months) with only 13 per cent of the routes used for the full duration. It is noted that traffic distribution is altered by the amended location of the project, and the revised or new worker accommodation facilities and construction compounds.

Road network performance

The traffic impact within the amended traffic study area during construction is likely to be noticeable on local roads, existing access tracks and at specific access locations within the amended project footprint due to an increase in vehicle trips.

During the peak construction period:

- the peak hour increase in:
  - traffic on all roads providing access to the amended project footprint would range between 10 and 90 vehicles per direction of travel
  - light vehicle traffic on all roads providing indicative access to the amended project would range between five and 60 vehicles per direction of travel
  - heavy vehicle traffic on all roads providing access to the amended project would range between five and 50 vehicles per direction of travel
- the median hourly increase in:
  - traffic on roads would be 25 vehicles per direction of travel
  - light vehicle traffic would be 10 vehicles per direction of travel
  - heavy vehicle traffic would be 15 vehicles per direction of travel.

These traffic volume increases are considered low because they would not result in any change in the Level of Service (LoS) of the roads across the amended traffic study area.

With the additional construction traffic, there would be a minor increase in the level of congestion on the indicative access routes, but there would be no change in level of service. Due to the low existing levels of traffic and the regional rural setting, the additional traffic would result in some noticeable change. However, with regards to road capacity, all roads modelled would operate reasonably in free-flow conditions. This demonstrates that the road network in the amended traffic study area would keep on operating at nearly the same level of network performance as present, which is consistent with the impact determined in the EIS.

The assessment indicates the expected impact of additional traffic on road network performance would be low. In particular, when considering the construction program and the distribution of construction and work

site locations over the full geographical extent of the amended project footprint, the expected additional volume of construction traffic generated by the amended project on national, state and regional roads (taking into consideration the design capacity) is expected to be minor. In summary, the overall increase in construction traffic due to the amended project is considered relatively minor in the context of the overall road network capacity within the amended traffic study area.

The delivery of materials to transmission line structures is anticipated to be via a combination of both road delivery and air delivery (ie by helicopter). In general, the use of helicopters, as proposed in the amended project, would reduce the potential for impacts on the road network within the amended traffic study area. For the purposes of this assessment, it has been assumed that all deliveries of materials would be via the road network and therefore represents a conservative assessment.

Road condition

Road condition generally deteriorates over time due to pavement fatigue, with heavy vehicle movements resulting in more noticeable pavement fatigue compared to light vehicles. With the relatively low increases in heavy vehicle traffic during construction as described in Table 6-49, the impact on the condition of the sealed roads within the amended traffic study area is expected to be minor. However, this would depend on the existing road condition and applicable load restrictions.

Impacts would be most likely to occur on the unsealed roads used to access construction compounds due to the volume of proposed heavy vehicle traffic. These roads include:

- Snubba Road
- Kopsens Road
- Bago Forest Way
- Livingstone Gully Road
- Graywood Siding Road/Crookwell Access Track
- Honeysuckle Road
- Kileys Creek Road
- Gadara Road
- Red Hill Road.

Potential impacts on road condition would be managed through the implementation of mitigation measures (refer to Appendix B (Updated mitigation measures)).

Intersections and access point connections

Intersections along the access routes for the amended project have been categorised by road types as follows:

- Category 1 – intersection with a primary road (state and regional roads)
- Category 2 – intersection with an arterial or sub-arterial road
- Category 3 – intersection with a local road.

Technical Report 16 - Revised Traffic and Transport Impact Assessment provides further consideration of the potential intersections for the amended project and any required design considerations to minimise potential traffic and road safety impacts. This includes assessment of potential vehicle site access requirements for the construction compounds and worker accommodation facilities, as these locations would experience the highest volumes of vehicle movements during construction of the amended project.

In general, traffic travelling along major roads would continue to have priority at the identified intersections and access points. It is also anticipated that any vehicle queuing at the access points would be limited to within the construction compounds or access tracks, as such, no notable impacts to traffic movements on existing major roads are expected.

The assessment has identified that potential changes at intersections may be required to accommodate the construction traffic and to support safe traffic operation in accordance with safety considerations detailed in the Austroads Guidelines. Temporary traffic management protocols may be implemented by construction contractors as an alternative measure to intersection upgrades. Utilisation of temporary traffic management would occur following a detailed risk assessment undertaken in consultation with the relevant road authorities after obtaining all necessary approvals.

The determination of the final treatments for access points onto private property, including measures such as fencing or cattle grids would be identified through consultation with the respective landowner. The treatment types will be developed and finalised during detailed design by the construction contractors.

Stringing of the transmission line across the road and rail network

The national, state and regional roads crossed by the proposed transmission line include Hume Highway, Snowy Mountains Highway, Gocup Road, Batlow Road, Tumbarumba Road, Burrinjuck Road, Rye Park Road, Grabben Gullen Road, Crookwell Road/Goulburn Road, Wondalga Road and Taralga Road. All of the roads would continue to operate at an acceptable level of service, consistent with the EIS. Some available routes within project LGAs and the updated project route description, including road crossings, are presented in Appendix A (Updated project description), and changes from the EIS have been highlighted.

Stringing of the transmission line would occur over roads where the transmission line crosses roads and would be undertaken with short-duration temporary partial or full road closures. The potential impact would include short-term increase in travel time and distance due to reduction in road capacity or speed restriction from traffic controls during partial road closures, or where detours would be required for full road closure. Road Occupancy Licences would be sought for all temporary (partial or full) road closures where required. Where full road closures are required, traffic would be provided with a detour route, potentially resulting in additional travel time. Any detour routes would be determined with relevant stakeholders including councils and the road authority and would be planned to minimise travel times for vehicles as far as possible. Impacts would be assessed case-by-case basis at the time of construction and the impacts would be minimised and managed with the implementation of traffic management plan. The impact of stringing of transmission lines to the public transport network is discussed below.

All stringing activities for the transmission lines across the Main Southern Railway Line would be undertaken during planned rail possessions with no disruptions to operations on the rail. Rail possessions would be undertaken in accordance with the railway line owners' or operators' requirements to avoid any impact to rail operations. In the case of the stringing over the Main Southern Railway Line, this would be in accordance with the Australian Rail Track Corporation's requirements. As such, disruption to railway network is not anticipated.

Road safety

As discussed above, the additional traffic associated with construction is unlikely to impact the road network performance. A review of crash data within 100 metres from the indicative access point to each construction compound and worker accommodation facility, as amended, and the proposed Gugaa 500 kV substation found no crash recorded between 2018 and 2022.

Construction of new access points and access tracks to construction compounds and worker accommodation facilities, as amended, and the proposed Gugaa 500 kV substation would be designed to support safe traffic operation. The new access tracks and access points would be designed in accordance with applicable standards, including Austroads requirements or the relevant asset owners' standards where required. In addition, signage will be implemented to promote awareness of the new intersections and turning vehicles.

Where construction activities are likely to impact on the existing operational conditions of a road (ie during full or partial road closures), temporary traffic management measures would be required to address the risk of accidents. With incorporation of appropriate traffic management measures for the expected traffic volumes and capacity of the roads, a negligible to minor impact on the road operating conditions and on road safety is expected.

Property access

Access to properties for residents (including for emergency vehicle access and egress) would generally be maintained throughout construction. In some limited circumstances, short-term restrictions for a particular property may need to be imposed with prior consultation with the affected party, consistent with the EIS impact. This would be mitigated through establishing a communication process with landowners, keeping them informed of construction staging and work schedule.

OSOM haul routes

Four OSOM haul routes have been identified as being potentially suitable (subject to certain requirements) to transport oversized equipment from the three nominated ports to the existing Bannaby 500 kV substation and to the proposed Gugaa 500 kV substation (Deugro, 2023 and RJA, 2021a and 2021b). This is an increase from the two potential OSOM haul routes and the one port (Port of Newcastle) identified in the EIS. The nominated ports of entry for the amended project include:

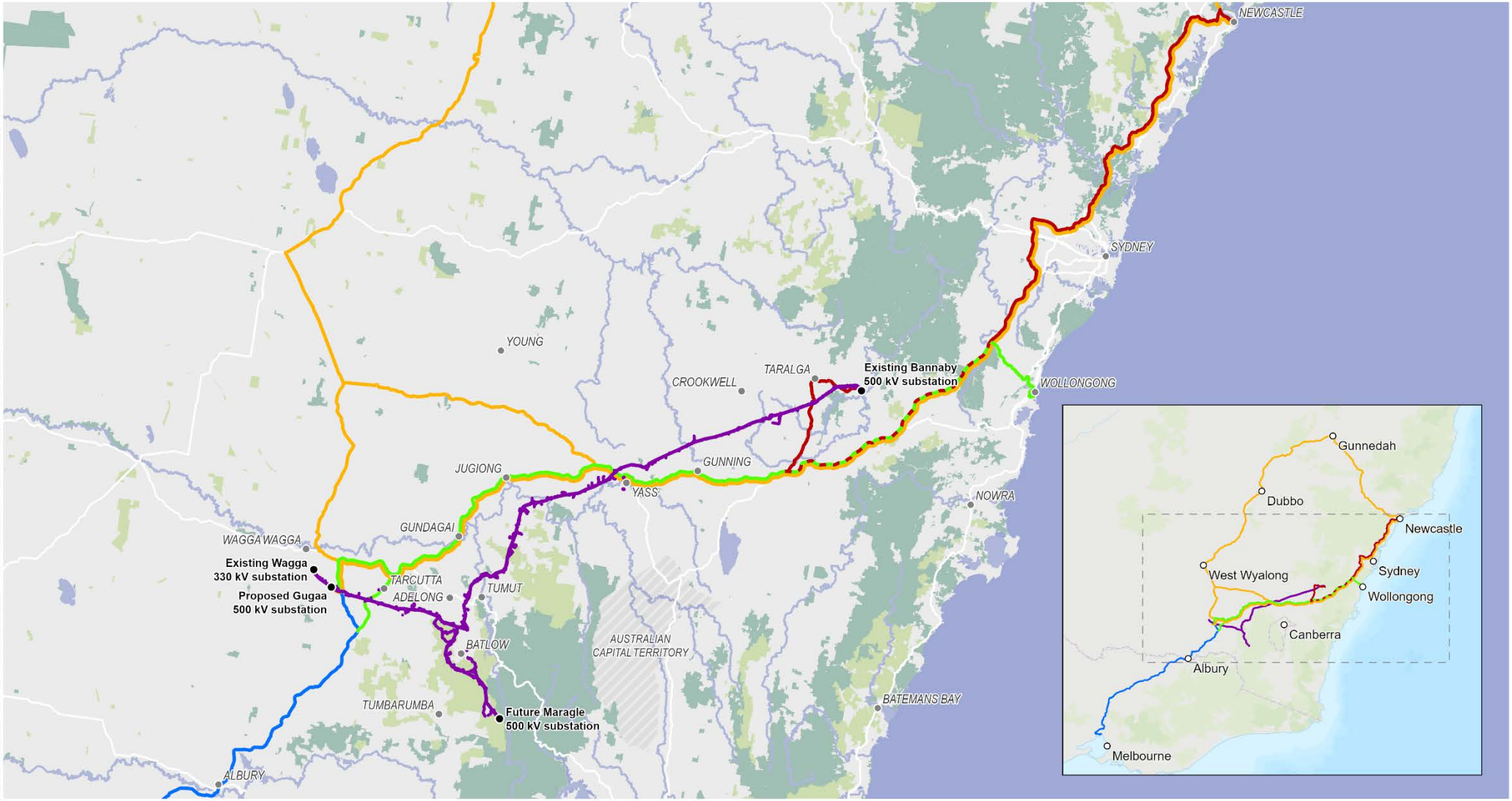
- Port of Melbourne
- Port Kembla
- Port of Newcastle.

All the state roads and some regional roads such as Tumbarumba Road, Elliot Way and Grabben Gullen Road are approved for the movement of restricted access vehicles and OSOM vehicles. Figure 6-16 shows potential OSOM haul routes from the ports to the amended project footprint. The distance from:

- Port of Newcastle to the Bannaby 500 kV substation is approximately 430 kilometres
- Port of Newcastle to the proposed Gugaa 500 kV substation is approximately 615 kilometres
- Port of Melbourne to the proposed Gugaa 500 kV substation is approximately 470 kilometres
- Port Kembla to the proposed Gugaa 500 kV substation is approximately 420 kilometres.

The indicative total OSOM vehicle movements for the duration of the project would be an estimated 28 OSOM deliveries to the proposed Gugaa 500 kV substation and four to the existing Bannaby 500 kV substation.

The assessment found that the use of these potential OSOM haul routes would be subject to addressing design constraints and legislative requirements so that the transport of oversized equipment is safe, and minimises impacts to the community, road assets and infrastructure. For example, minor modifications along delivery routes would be required to facilitate OSOM access, including widening and modification of the intersection of Gregadoo East Road and Livingstone Gully Road and temporary removal of several road signs. Permits and approvals may also be required to be obtained from the relevant regulators prior to transportation of the oversized equipment. *Technical Report 16 - Revised Traffic and Transport Impact Assessment* provides further detail on the constraints and requirements identified for the OSOM routes in the assessment. These considerations would be incorporated into and managed in accordance with the Traffic and Transport Management Plan and the mitigation measures provided in Appendix B (Updated mitigation measures).



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Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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FIGURE 6-16: Indicative haulage routes for OSOM deliveries to the amended project footprint

Public transport impacts

Bus services form the major public transport services in the amended traffic study area. As construction traffic is not anticipated to adversely impact on the road network performance, public bus services and school bus services are not expected to experience delays.

Short duration temporary road closures are anticipated primarily for stringing of transmission lines at limited road locations and where there are new access points onto public roads. Activities would be assessed on a case-by-case basis while seeking road occupancy approval from the relevant stakeholders with work undertaken in accordance with approved plans and conducted in a way to minimise impacts on traffic and access, in consultation with bus service operators. This may include planning these activities outside of peak traffic periods. Overall impacts to public transport would be negligible, consistent with the EIS.

Active transport impacts

Within the amended traffic study area, formal active transport provisions such as footpaths generally only exist in towns. The potential for the interaction of active transport users with construction traffic would be negligible, considering the low volume of additional construction traffic in these areas and lack of formal active transport facilities. This impact is consistent with the EIS.

Most of the regional roads within the amended traffic study area do not have dedicated pedestrian and cyclist facilities. Traffic associated with transmission line route, construction compounds, worker accommodation facilities and substations is generally located outside of towns where no active transport provisions exist, and therefore impacts to active transport users in these locations is considered unlikely.

Traffic and transport impacts associated with existing approved extractive material locations

Sixteen existing approved extractive material locations have been identified as a potential source of fill material for the amended project. The number of existing approved extractive material locations would be reviewed as part of the ongoing design development and construction methodology refinement. The construction contractors will select the sites most suitable for use.

The anticipated number of trips generated from the transport of fill material are included in the indicative vehicle movements (refer to Table 6-49) and the assessment of traffic distribution and performance described earlier. The roads providing the access from extractive material locations to the amended project have also been included in the amended traffic study area. Vehicles transporting material between the extractive material locations and the work sites are likely to primarily use major roads and highways with travel on local roads limited to the first and last stage of the journey.

Traffic and transport impacts associated with water supply strategy

The roads providing access from potable and non-potable water supply options to the amended project footprint have also been included in the amended traffic study area. Vehicle movements associated with the water supply strategy would not result in any major network impacts. All access routes required for water supply would continue to operate at LoS A (meaning free flow operations) during construction. Refer to *Technical Report 16 – Revised Traffic and Transport Impact Assessment* for greater detail on LoS classifications.

The anticipated number of trips likely to be generated based on the revised water supply strategy are accounted for in the indicative vehicle movements (refer to Table 6-49) and the assessment of traffic distribution and performance described earlier.

Heavy vehicle movements for water supply would be minimised through residential areas where practicable and undertaken during standard construction hours, or in accordance with an Out-of-Hours Work (OOHW) Protocol.

6.14.2.2. Operational impacts

Road network impacts

During operation, there is limited potential for traffic and transport impacts associated with anticipated routine maintenance. The substations and transmission lines would be inspected by Transgrid operational staff and contractors on a regular basis, with other operational activities occurring in the event of an emergency. Maintenance at substation sites would largely comprise ad hoc attendance (typically one to two times a month) whereas maintenance for the transmission lines would include an annual fly over, structure inspection on a six-yearly cycle, vegetation management every four to six years as well as ad hoc maintenance. A maximum of four light vehicle (LV) trips are anticipated for eight workers at each substation location with vehicle occupancy of two workers per vehicle. For transmission line maintenance and inspection, five LV trips are anticipated for ten workers with vehicle occupancy of two workers per vehicle and one heavy vehicle trip.

The traffic generated during operation of the amended project would be insignificant. The low volume of operational traffic would have a negligible impact on the road network including road network performance and road condition.

The volume of traffic associated with operation and maintenance activities is relatively low and is expected to have a negligible impact on the safety of the existing road network. This level of impact is consistent with the EIS, despite the removal of the telecommunications hut at Killimicat proposed in the EIS project.

Rail network and public transport impacts

During operation, maintenance activities near the rail network would be limited to inspections of transmission line structures and managing localised transmission line network disruptions when they occur. During these events, work would be undertaken in consultation with rail authorities, by appropriately authorised personnel and within the required clearances from existing rail lines to minimise any disruptions to the rail network. The impact is therefore expected to be negligible, consistent with the EIS.

The low traffic generated for operation of the amended project combined with the infrequent nature of the traffic movements would have limited interaction with public transport services and school bus services. Operational traffic is anticipated to have a negligible impact, consistent with the EIS, on public transport and school bus services.

Active transport impacts

Within the amended traffic study area, active transport provisions such as footpaths exist in urban environments only. The traffic for operation and maintenance activities is expected mainly in the vicinity of transmission lines and substations, where no active transport provisions exist.

The increase in traffic due to operation of the amended project is expected to have a negligible impact on active transport, consistent with the EIS.

6.14.3. Updated mitigation measures

The approach to management and avoidance/ minimisation of traffic, transport and access impacts remains largely consistent with the approach provided in Chapter 20 (Traffic, transport and access) of the EIS. Consultation has been undertaken with Transport for NSW and local councils since February 2022 in relation to traffic and transport matters. This included detailed engagement with Transport for NSW and local councils on the amendments and refinements following public exhibition of the EIS. Further consultation will be carried out as the amended project is further developed during detailed design to continue identification of necessary measures to avoid/minimise impacts on the surrounding transport network.

Mitigation measures TT1, TT2 and TT4 have been revised to provide further clarification of relevant standards, permits or approvals, and also to incorporate feedback from local councils. The updates are shown in **green** and ~~**strikethrough**~~ in Table 6-50. The consolidated list of mitigation measures for the amended project is provided in Appendix B (Updated mitigation measures).

Table 6-50 Summary of revised traffic, transport and access mitigation measures

Reference	Impact	Mitigation measures	Timing	Relevant location
TT1	Road safety – design	Access tracks, access connections and road upgrades required to facilitate the movement of project related traffic will be designed **and constructed in a fit for purpose manner for construction. Where required, intersection works with public roads will be designed and constructed** according to relevant Austroads guides **or the relevant asset owners' standards**.	Detailed design	Access tracks and roads
TT2	Impact to road network during OSOM deliveries	Prior to commencement of transportation activities, the validity of the previously undertaken haulage route studies will be confirmed in consideration of final haulage route conditions and applicable route restrictions for the period during which transportation of such components is planned. **Any relevant permits and approvals will be sought from National Heavy Vehicle Regulator, the relevant road and rail authorities, NSW police, and utility owners and providers.**	Detailed design	Transportation route
TT4	Road maintenance	Prior to construction, road ~~**dilapidation surveys**~~ **condition assessments** will be carried out for all local roads to be used during construction. The surveys will assess the current condition of the road surface **and will be documented in a road condition report, with a copy being provided to the relevant road authority**. ~~**At the completion of project construction, a subsequent road condition assessment will be prepared to assess the damage to roads accessed by project related traffic.**~~ **Road condition assessments will be undertaken during and following construction to assess the damage to roads accessed by project-related traffic.** Damage caused by the project will be rectified **or compensated for, during or after construction,** in consultation with the relevant road authority.	Detailed design and construction	Access routes

6.15. Air quality

6.15.1. Approach to assessment

Technical Report 17 - Air Quality Impact Assessment Addendum has been prepared to consider the risk of potential air quality impacts from the proposed amendments and refinements to the project.

There has been no change to the legislative and policy context presented in *Technical Report 17 - Air Quality Impact Assessment* prepared for the EIS.

The assessment of the amendments and refinements has been prepared largely in accordance with the assessment approach methodology outlined within *Technical Report 17 - Air Quality Impact Assessment* prepared for the EIS. The amended project has not resulted in a change to the air pollutants of concern assessed ie dust emissions and products of combustion.

As a result of the amended project footprint and construction details, revisions have been made to the air quality study area and the sensitive receptors identified as shown in Figure 6-17. In accordance with the Institute of Air Quality Management (IAQM) Guidance (Holman et al, 2014), sensitive receptors within 350 metres of the amended project footprint were identified. The IAQM Guidance also recommends consideration of sensitive receptors within 500 metres of the access point to a construction site (ie access tracks), and therefore a 500 metre buffer on either side of the amended project footprint was assessed. A one kilometre buffer around locations within the amended project footprint where helipads and/or diesel generators may be in use was also considered.

Table 6-51 summarises the recommended separation distances from sensitive receptors that have been developed based on relevant guidelines for the following specific construction activities.

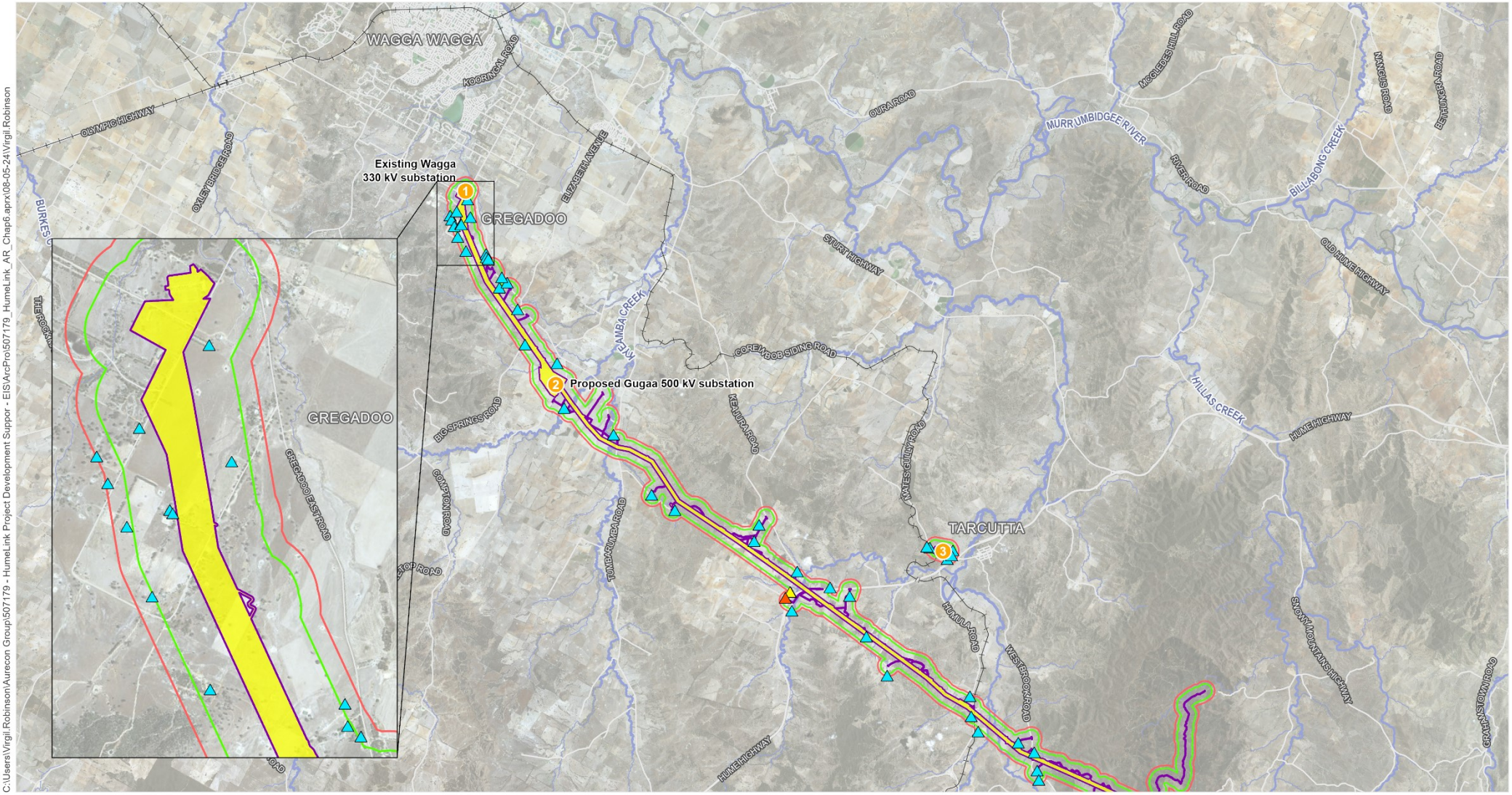
Table 6-51 Recommended separation distances

Activity	Scale	Recommended separation distance (m)	Reference	Relevance to the project
Electric power generation	Electrical power generation using fuel other than natural gas:		*Guideline: Recommended Land Use Separation Distances* (NT EPA, 2017)	Locations where diesel-fuelled generators would be used (such as construction compounds and worker accommodation facilities)
	Greater than or equal to 10 megawatts in aggregate	1,000		
	Greater than or equal to 100 kilowatts but less than 10 megawatts in aggregate	500		
Concrete plant	Greater than 5,000 tonnes per year	100	*Recommended Separation Distances for Industrial Residual Air Emissions* (VIC EPA, 2013)	Locations where concrete batching plants would be located that would produce greater than 5,000 tonnes per annum (such as construction compounds)
Crushing, grinding or milling	Rock, ores or minerals excluding lease or private mine or wet sand	500	*Separation Distance Guidelines for Air Emissions* (ACT Government, 2018)	Locations where crushing or grinding activities would be undertaken (such as construction compounds)

Activity	Scale	Recommended separation distance (m)	Reference	Relevance to the project
Screening of materials	Premises on which material extracted from the ground is screened, washed, crushed, ground, milled, sized or separated.		*Guideline: Recommended Land Use Separation Distances* (NT EPA, 2017)	Locations where screening of materials would be undertaken (such as construction compounds)
	Greater than 5,000 but less than 50,000 tonnes per year	500		
	Greater than 50,000 tonnes per year	1,000		
Crushing of building material	Crushing or cleaning of waste building or demolition material	1,000	*Recommended Separation Distances for Industrial Residual Air Emissions* (WA EPA, 2015)	Locations where crushing of waste building or other demolition materials would be undertaken (such as construction compounds)
Extractive industries	Hard rock quarrying (including controlled blasting), crushing and screening	1,500	*Recommended Separation Distances for Industrial Residual Air Emissions* (WA EPA, 2015)	Locations where controlled blasting would be required

As per the EIS, no significant quantities of odorous chemicals or volatile organic compounds (VOCs) (which can be potentially odorous) would be stored or used on site during either construction or operation of the amended project. As such, no detailed assessment of odour was considered to be required for the amended project.

The amended air quality study area is shown in Figure 6-17. Due to the length of the project, and the need to consider impacts of construction activities at a local level, the potential impact on air quality of construction activities has been considered in seven sections. Transmission line Section 2 has been split into Section 2a and Section 2b (as shown in Figure 6-17e and Figure 6-17f).



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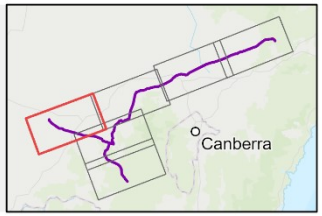
Amended project footprint
350m buffer
500m buffer
Waterway
Railway

Sensitive receiver within 500m buffer
Firestation - Bush
Possible residence
Residential

Construction ancillary facilities
1 Wagga 330 kV substation compound (C01)
2 Amended Gregadoo Road compound (C06)
3 Tarcutta accommodation facility and compound (AC03)

Transmission line sections
Section 1: Wagga 330 kV substation to Wondalga



Source: *Aurecon, Transgrid, ALA, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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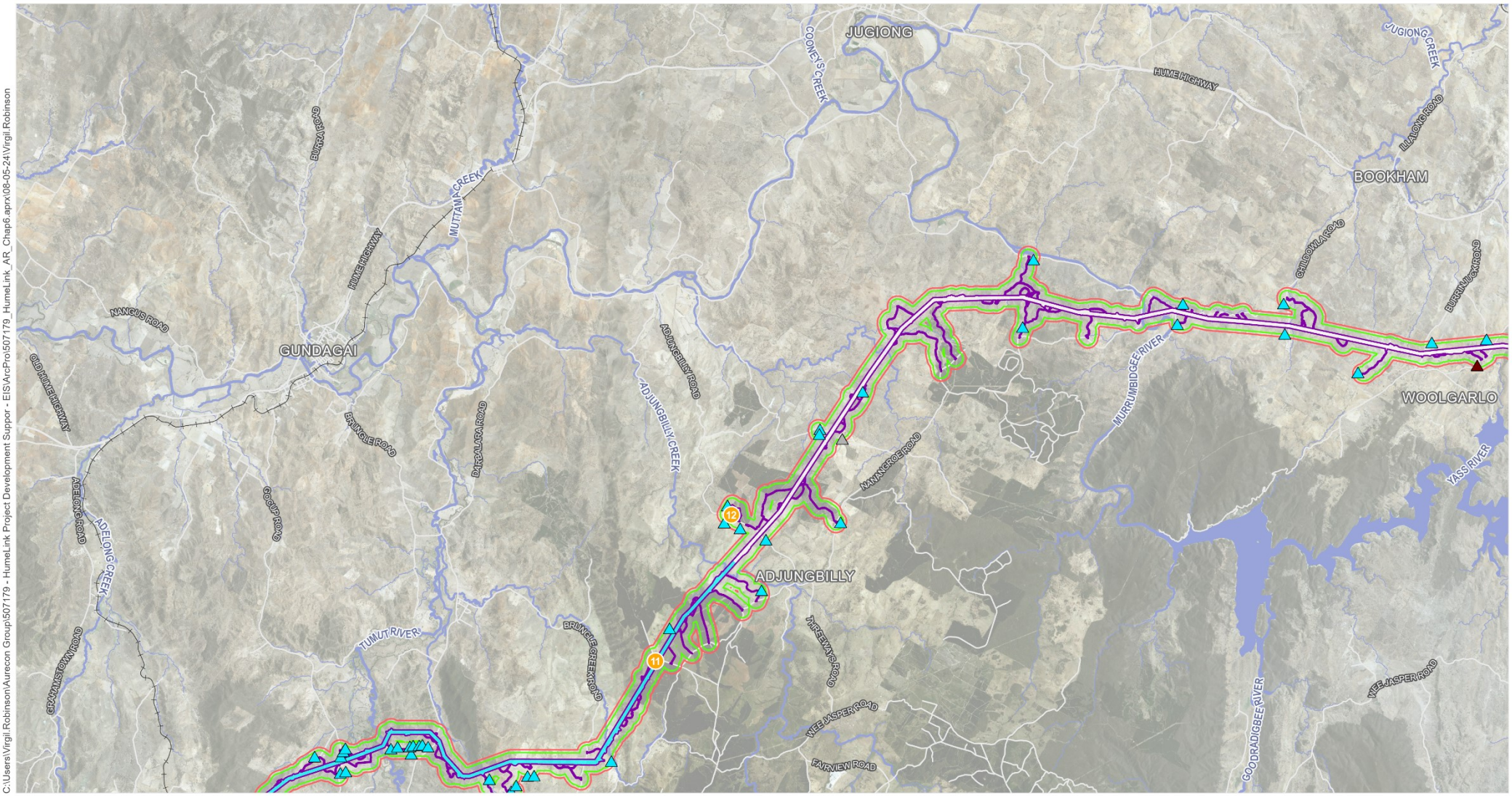
Figure 6-17a: Sensitive receiver location within and surrounding the amended air quality study area



Amended project footprint
350m buffer
500m buffer
Waterbody
Waterway
Railway

Sensitive receiver within 500m buffer

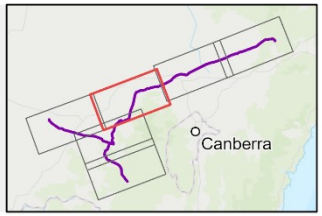
Camping Ground
Dilapidated dwelling
Residential

Construction ancillary facilities

11 Amended Honeysuckle Road compound (C07)
12 Adjungbilly accommodation facility and compound (AC04)

Transmission line sections

Section 3: Wondalga to Adjungbilly
Section 4: Adjungbilly to Yass



Source: *Aurecon, Transgrid, ALA, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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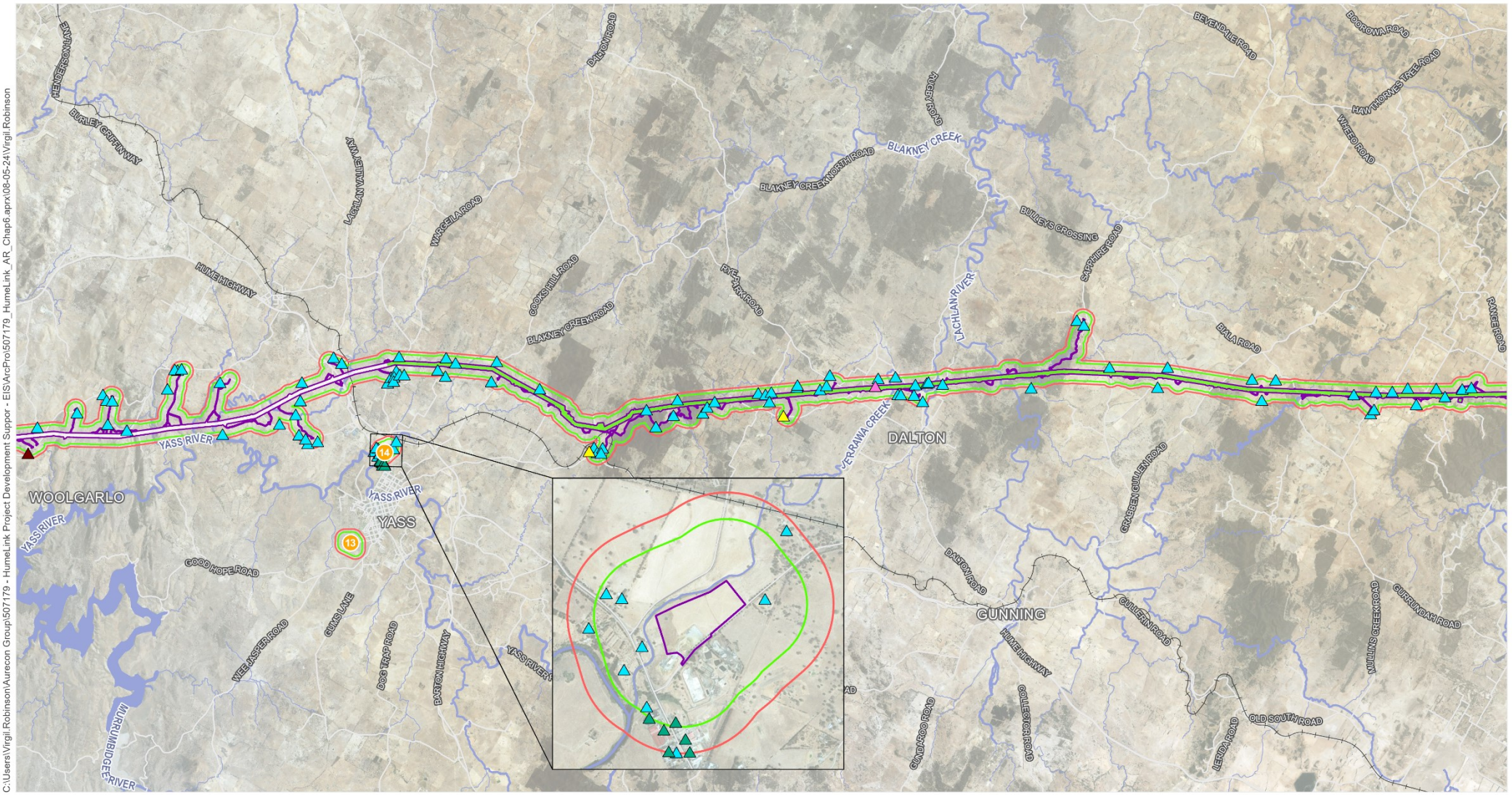
Figure 6-17b: Sensitive receiver location within and surrounding the amended air quality study area



Amended project footprint
350m buffer
500m buffer
Waterbody
Waterway
Railway

Sensitive receiver within 500m buffer

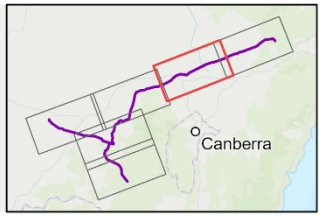
Camping Ground
Commercial
Possible residence
Place of Worship
Residential

Construction ancillary facilities

13 Yass substation compound (C10)
14 Yass accommodation facility and compound (AC05)

Transmission line sections

Section 4: Adjungbilly to Yass
Section 5: Yass to Roslyn



Source: *Aurecon, Transgrid, ALA, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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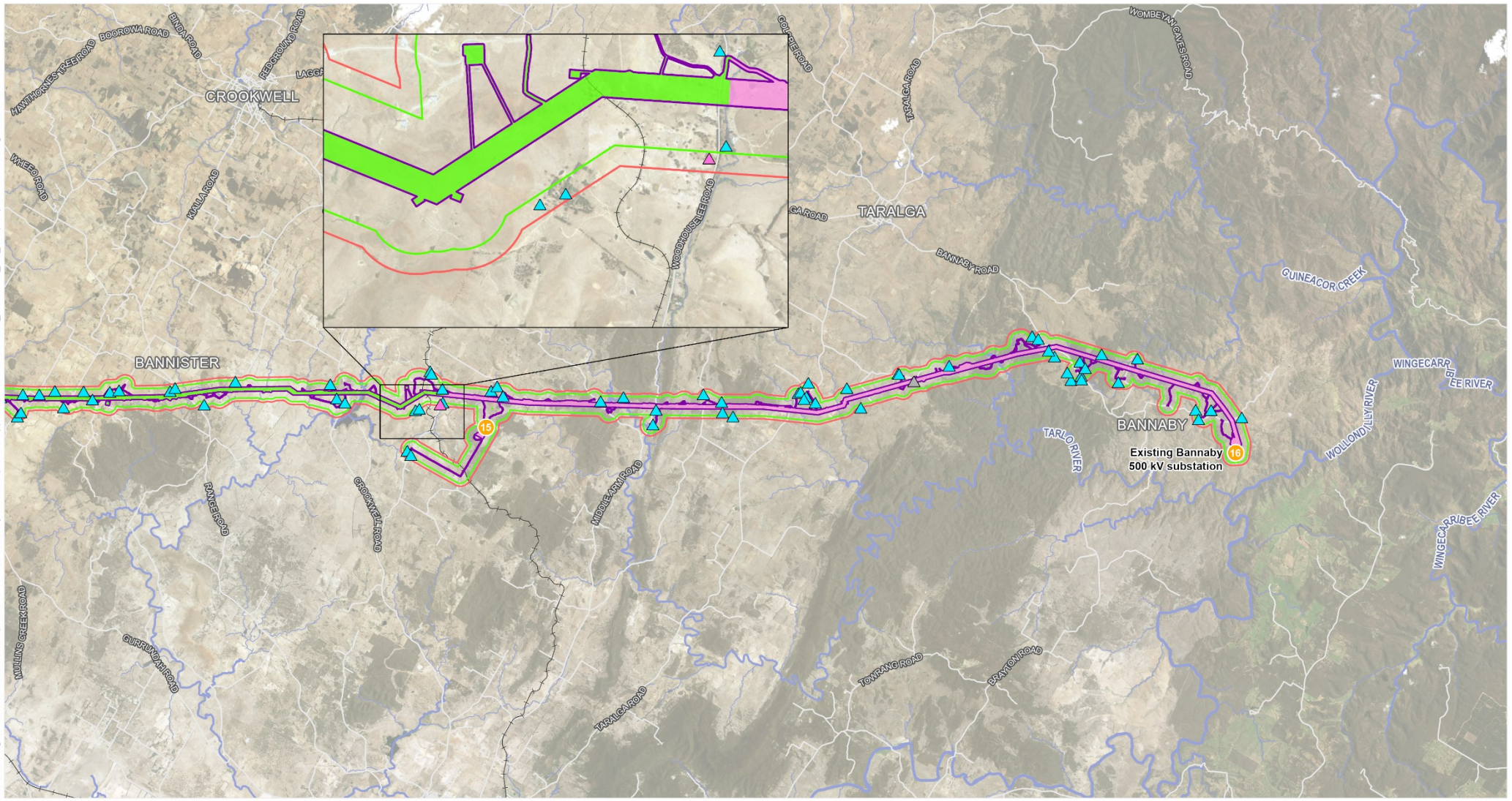
Figure 6-17c: Sensitive receiver location within and surrounding the amended air quality study area



Amended project footprint
350m buffer
500m buffer
Waterway
Railway

Sensitive receiver within 500m buffer
Dilapidated dwelling
Place of Worship

Residential

Construction ancillary facilities
15 Crookwell accommodation facility and compound (AC06)
16 Amended Bannaby 500 kV substation compound (C12)

Transmission line sections
Section 5: Yass to Roslyn
Section 6: Roslyn to Bannaby

Canberra

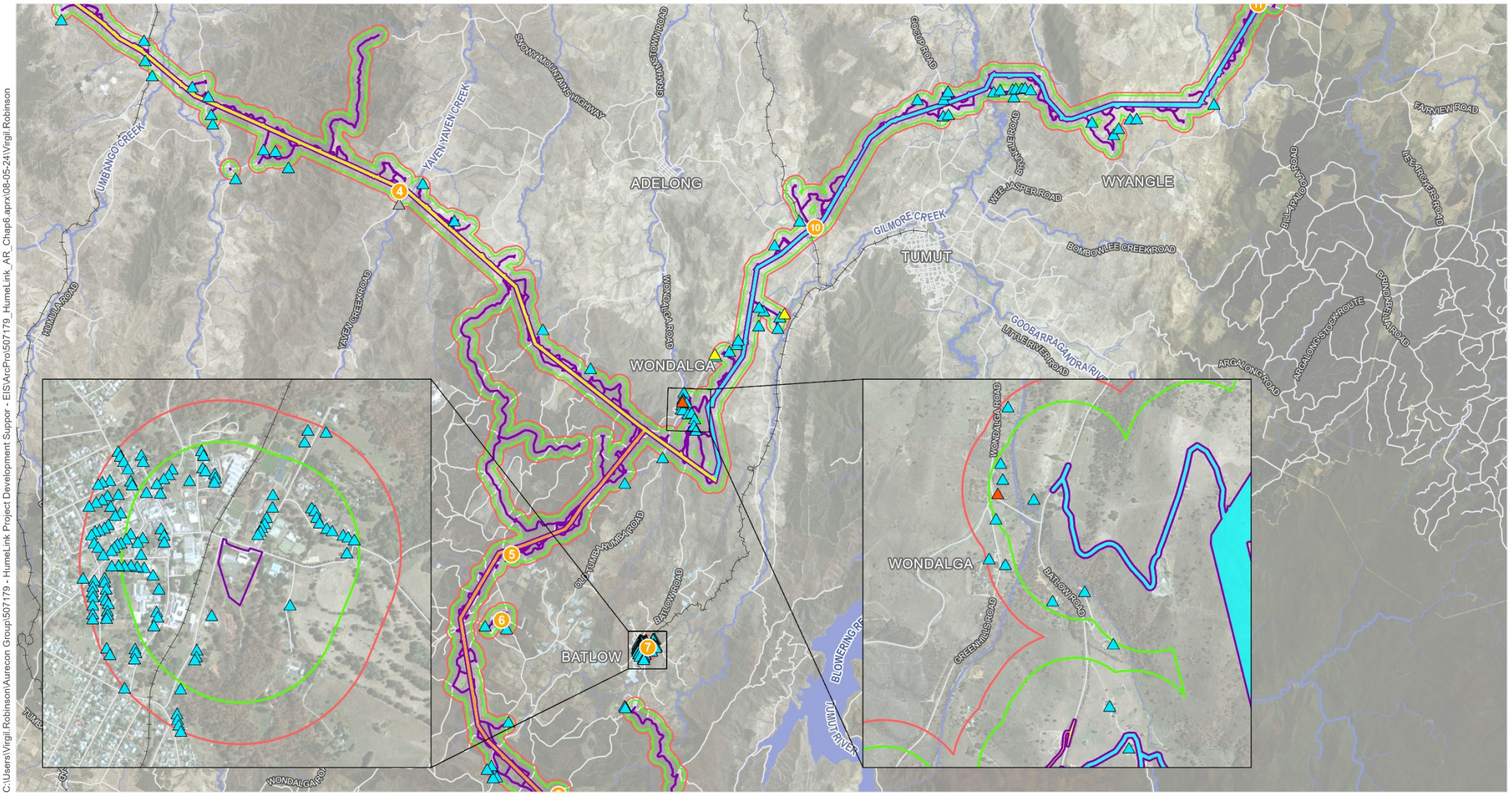
Source: *Aurecon, Transgrid, ALA, Spatial Services (DCS), ESRI Basemap*

1:200,000
0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink

Figure 6-17d: Sensitive receiver location within and surrounding the amended air quality study area



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- Amended project footprint
- 350m buffer
- 500m buffer
- Waterbody
- Waterway
- Railway

Sensitive receiver within 500m buffer

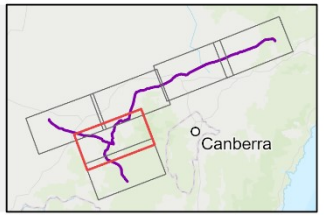
- Dilapidated dwelling
- Firestation - Bush
- Possible residence
- Residential

Construction ancillary facilities

4. Ellerslie Road compound (C21)
5. Ardrossan Headquarters Road compound (C17)
6. Green Hills accommodation facility and compound (AC07)
7. Amended Memorial Avenue compound (C14)
8. Snubba Road compound (C18)
10. Gadara Road compound (C19)
11. Amended Honeysuckle Road compound (C07)

Transmission line sections

- Section 1: Wagga 330 kV substation to Wondalga
- Section 2a: Wondalga to Snubba Road compound (C18)
- Section 3: Wondalga to Adjungbilly



Source: *Aurecon, Transgrid, ALA, Spatial Services (DCS), ESRI Basemap*

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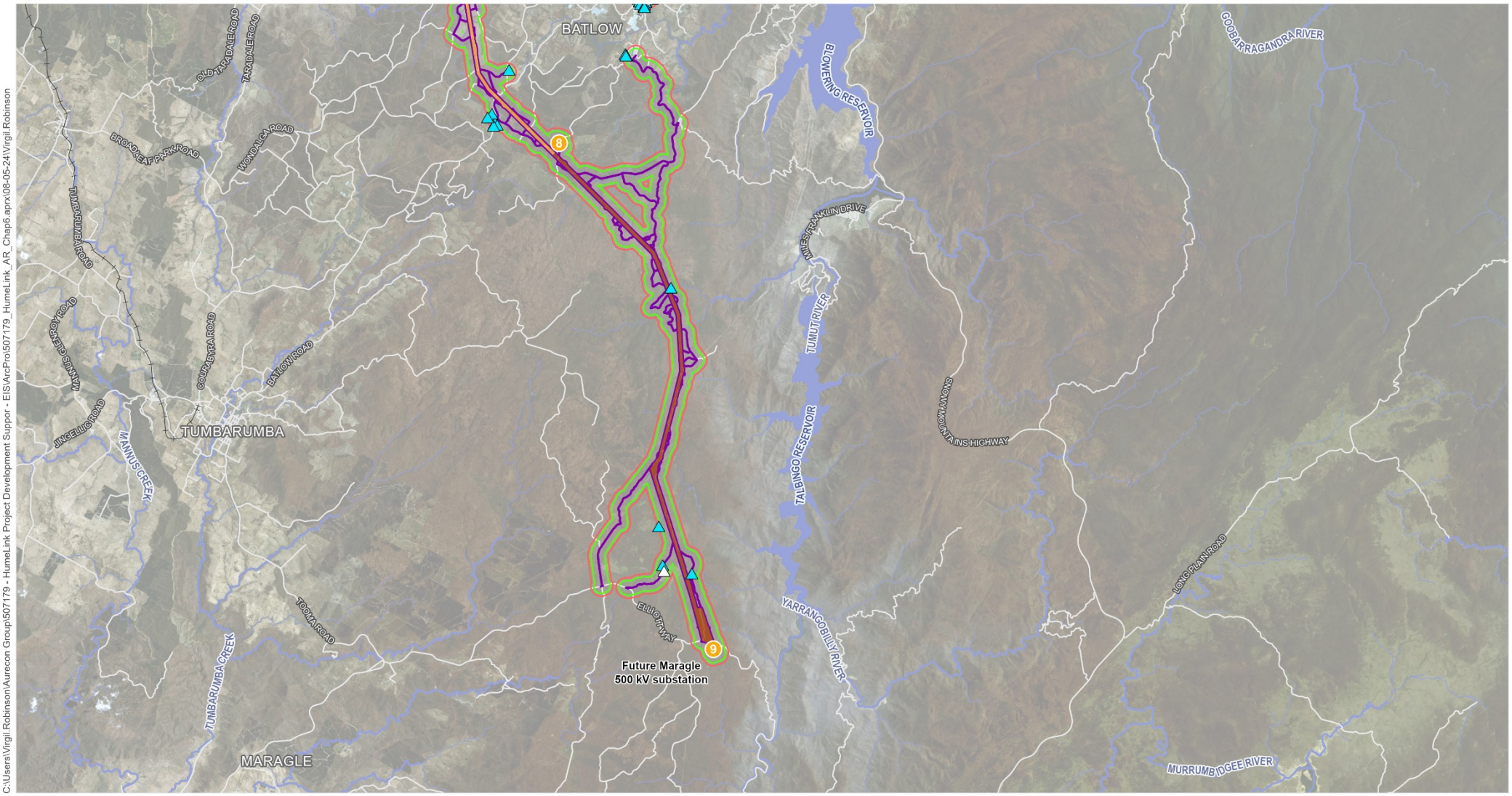
Projection: GDA 1994 MGA Zone 55

Figure 6-17e: Sensitive receiver location within and surrounding the amended air quality study area

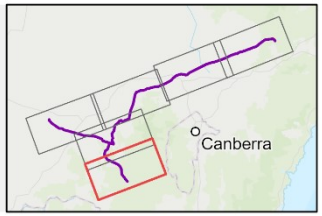


Amended project footprint
350m buffer
500m buffer
Waterbody
Waterway
Railway

Sensitive receiver within 500m buffer
Residential
Tourist Park / Home Village

Construction ancillary facilities
8 Snubba Road compound (C18)
9 Maragle 500 kV substation compound (C05)

Transmission line sections
Section 2a: Wondalga to Snubba Road compound (C18)
Section 2b: Snubba Road compound (C18) to future Maragle 500 kV substation



Source: *Aurecon, Transgrid, ALA, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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Figure 6-17f: Sensitive receiver location within and surrounding the amended air quality study area

6.15.2. Assessment of amendments and refinements

6.15.2.1. Construction impacts

Dust emissions

During construction, dust emissions can occur during activities including demolition, earthworks, construction and track-out (the movement of site material onto public roads by vehicles). Emissions can vary substantially from day to day, depending on a variety of factors. A large proportion of the dust emissions during construction would result from construction plant and vehicles moving over temporary roads or access tracks and open ground. The scale of dust emission impacts depends on the dust suppression and other mitigation measures applied.

Table 6-52 summarises the potential dust risk at sensitive receptors (with and without the application of mitigation measures) near locations to the amended project that have changed as a result of the amendments and refinements of the project. The dust risk has been identified in accordance with the IAQM method. This method involves identifying the dust risk in consideration of several factors including the magnitude of dust expected from construction activities as well as the sensitivity of the area which is determined by the number, type and proximity of sensitive receptors to the construction activities.

Table 6-52 Summary of dust risk without and with mitigation measures - construction

Amended project component	Location and dust risk **of amended project components** with no mitigation	**Dust risk with mitigation**
Transmission lines and access tracks including consideration of: • changes to the transmission line corridor • nomination of access tracks • additional telecommunications connections and removal of the telecommunications hut	Transmission line corridor and access track sections: • High: - Section 1: Wagga 330 kV substation to Wondalga - Section 2a: Wondalga to Snubba Road compound (C18) - Section 3: Wondalga to Adjungbilly - Section 4: Adjungbilly to Yass • Medium: - Section 2b: Snubba Road compound (C18) to future Maragle 500 kV substation - Section 5: Yass to Roslyn - Section 6: Roslyn to Bannaby	Negligible
Substations including consideration of the change to the substation design at the proposed Gugaa 500 kV substation	• High: - Proposed Gugaa 500 kV substation	Negligible
Construction compounds and worker accommodation facilities including consideration of the new and amended construction ancillary facilities	• High - Green Hills accommodation facility and compound (AC07) • Medium - Ardrossan Headquarters Road compound (C17) - Ellerslie Road compound (C21) • Low - Tarcutta accommodation facility and compound (AC03) - Adjungbilly accommodation facility and compound (AC04) - Yass accommodation facility and compound (AC05) • Negligible - Amended Gregadoo Road compound (C06)	Negligible

Amended project component	Location and dust risk **of amended project components** with no mitigation	Dust risk with mitigation
	- Amended Memorial Avenue compound (C14) - Snubba Road compound (C18) - Gadara Road compound (C19) - Crookwell accommodation facility and compound (AC06) - Amended Honeysuckle Road compound (C07)	

As shown in Table 6-52, the dust risk from construction activities at all transmission line sections and access tracks was assessed as medium to high if no mitigation measures were applied to control emissions during earthworks, construction and construction vehicles 'tracking out' dirt from the construction site. However, active construction work sites for the transmission line structures would only be exposed for up to four months. The most dust-intensive work would occur as a result of earthworks for access tracks and transmission line structure foundation work which are likely to last approximately four days per transmission line structure and one to two days per access track.

The dust risk for the construction compounds and combined construction compounds and worker accommodation facilities was assessed to range from negligible to high (without mitigation) based on a combination of the sensitivity of the areas and magnitude of dust emissions expected during construction activities. The Green Hills accommodation facility and compound (AC07) was assessed as having a high dust risk (without mitigation) predominately due to a large amount of earthworks, construction activities required and potential for construction vehicles 'tracking out' dirt from the construction site.

During construction of the Gugaa 500 kV substation there is predicted to be high risk of dust impacts occurring at sensitive receptors without mitigation measures. The nearest sensitive receptor is located adjacent to the south-eastern access road to the site, with the next closest two sensitive receptors located approximately 600 to 800 metres from the site boundary.

It is expected that with the implementation of revised mitigation measures outlined in Section 6.15.3, residual dust impacts for construction activities would be managed to acceptable levels such that there is a negligible risk of adverse air quality impacts at sensitive receptors.

It is also noted that the amended project would reduce risk of dust impacts for sensitive receptors near the previous transmission line corridor sections and construction facilities that are no longer proposed, including sensitive receptors near the previously proposed Snowy Mountains Highway compound (C02), Snubba Road compound (C03), Adjungbilly Road compound (C09), Woodhouselee Road compound (C11), Bowmans Lane compound (C15) and Tumbarumba accommodation facility (AC01).

Technical Report 17 - Air Quality Impact Assessment Addendum includes a preliminary high-level screening assessment of potential constraints to the location of helipads, diesel-fuelled generators, concrete batching plants and crushing/screening activities, with consideration of the recommended separation distances (as outlined in Section 6.15.1 and Table 6-53).To minimise risk of adverse dust or other air quality impacts, this assessment identified potential constraints and considerations for the final siting or use of:

- helipads within the Amended Gregadoo Road compound (C06), Ardrossan Headquarters Road compound (C17), Gadara Road compound (C19), Ellerslie Road compound (C21), Tarcutta accommodation facility and compound (AC03), Adjungbilly accommodation facility and compound (AC04) and Yass accommodation facility and compound (AC05) and Green Hills accommodation facility and compound (AC07)

- diesel fuelled generators at Ardrossan Headquarters Road compound (C17), Gadara Road compound (C19), Ellerslie Road compound (C21), Tarcutta accommodation facility and compound (AC03), Adjungbilly accommodation facility and compound (AC04), Yass accommodation facility and compound (AC05) and Green Hills accommodation facility and compound (AC07)
- concrete batching plants at Ardrossan Headquarters Road compound (C17)
- crushing/screening plants at the Amended Memorial Avenue compound (C14), Ardrossan Headquarters Road compound (C17), Ellerslie Road compound (C21), Yass accommodation facility and compound (AC05) and Green Hills accommodation facility and compound (AC07).

Should it not be achievable to meet the recommended separation distances or limit the facility capacity (eg size of generators or volume of concrete batching) to below the recommended guideline values, alternative controls to minimise potential impacts will be investigated and implemented (refer to Section 6.15.3).

Products of combustion

Emissions due to products of combustion (including particulate matter during construction and operation of the project predominantly relates the use of diesel generators, trucks and other vehicles, including helicopters accessing and idling within the amended project footprint and diesel-powered construction equipment such as cranes and excavators.

The total emissions due to combustion during construction represent less than one per cent of the annual National Pollutant Inventory emissions for NSW. Whilst some combustion emissions would be localised (eg use of generators at construction compounds), the majority would occur intermittently over large areas. As such, the magnitude of the impact is anticipated to be negligible for local sensitive receptors with the implementation of mitigation measures and separation distances for diesel generators.

6.15.2.2. Operational impacts

The assessment of operational air quality impacts for the amended project remain unchanged from the EIS.

6.15.3. Updated mitigation measures

The approach to management and avoidance/minimisation of air quality impacts remains largely consistent with the approach provided in Chapter 21 (Air quality) of the EIS.

In response to refinements to the construction methodology, two mitigation measures (AQ4 and AQ5) have had minor updates in relation to the need to further consider the siting and usage of concrete batching and crushing/screening plants to minimise potential dust impacts during construction. Two new mitigation measures (AQ6 and AQ7) have also been included to minimise the risks to air quality from operation of diesel generators and helipads on sensitive receptors. The updates are shown in **green** and ~~**strikethrough**~~ in Table 6-53. The consolidated list of mitigation measures for the amended project is provided in Appendix B (Updated mitigation measures).

Table 6-53 Summary of revised air quality mitigation measures

Reference	Impact	Mitigation measures	Timing	Relevant location
AQ4	Operation of concrete batching plant(s)	Measures will be implemented at concrete batching plants to minimise emissions to air as far as possible, and will be regularly inspected with additional controls implemented as required. **Concrete batching plants that will produce greater than 5,000 tonnes per year will be located 100 m (or more) from sensitive receptors.** Measures to minimise emissions to air may include **(where relevant)**: • all aggregate and sand will be stored appropriately in storage bins or bays to minimise dust generation, and material will not exceed the height of the bay • cement silos and hoppers will be fitted with dust filters • all inspection points and hatches will be fully sealed • all dry raw materials to be transferred into the bowl of an agitator via front end loaders by maintaining adequate moisture levels and/or an enclosed conveyor • the cement silo will be fitted with emergency pressure alert and automatic cut off overfill protection • transfer of cement from storage to batching will occur via sealed steel augers • **regular** ~~**regularly**~~ ~~**inspect**~~ monitoring of dust emissions and apply additional controls as required. **Where recommended separation distances cannot be achieved, alternative controls to minimise potential impacts will be investigated and implemented.**	Construction	Concrete batching plant(s)

Reference	Impact	Mitigation measures	Timing	Relevant location
AQ5	Crushing/screening activities	To minimise dust emissions during crushing/screening activities, the following measures (as a minimum) will be considered and implemented where practicable and appropriate: • **locate plant 500 m (or more) from sensitive receptors** • ~~**fit**~~ screen covers will be fitted to the crushing/screening equipment • control dust emissions from screening activities using water sprinklers, where required and appropriate • inspect the water sprinklers on a regular basis and maintain as required to ensure operational efficiency • where practicable, install wind breaks in appropriate locations adjacent to the dust generating equipment and processes • prior to screening, dampen the rocks during dry weather conditions. The effectiveness of the implemented controls will be monitored, and additional controls implemented as required to address any performance issues identified. **Where recommended separation distances cannot be achieved, alternative controls to minimise potential impacts will be investigated and implemented.**	Construction	Crushing/screening plant(s)
AQ6	**Diesel generators**	**To minimise the impact of emissions from the use of diesel generators on sensitive receptors, the following measures (as a minimum) will be considered and implemented where practicable and appropriate:** • **Locate the equipment so it is away from the prevailing wind direction and maximise the distance to the nearest sensitive receiver** • **Connect to existing electricity network rather than using diesel generators where possible.** • **If connection to existing electricity network is not possible, where practical and appropriate implement the following recommended separation distances:** - **Greater than 10 MW in aggregate: 1,000 metres from sensitive receptor locations** - **Greater than or equal to 100 kW but less than 10 MW in aggregate: 500 metres from sensitive receptor locations** **Where recommended separation distances cannot be achieved, alternative controls to minimise potential impacts will be investigated and implemented.**	**Construction**	**Diesel generators at compounds and worker accommodation facilities**

Reference	Impact	Mitigation measures	Timing	Relevant location
AQ7	Helipads	To minimise the impact of air emissions from the use of helipads on sensitive receptors, the following measures (as a minimum) will be considered and implemented where practicable and appropriate: • Locate helipad as far as practical from sensitive receptors • Minimise dust generation at take-off and landing sites and sites being used for transmission line structure assembly (particularly those used frequently) by the implementation of dust control measures including: - provision of water carts to apply water or other dust suppressants as and when required on work areas close to potential sensitive receptors - visual monitoring of dust generation - community liaison and mechanisms for registering and resolving complaints.	Construction	Helipads at compounds and worker accommodation facilities

6.16. Climate change and greenhouse gas

6.16.1. Approach to assessment

There has been no change to the legislative and policy context presented in *Technical Report 18 - Greenhouse Gas Assessment* prepared for the EIS.

The climate change and greenhouse gas assessment of the amendments and refinements has been prepared largely in accordance with the assessment approach methodology outlined within Chapter 22 (Climate change and greenhouse gas) of the EIS. Due to the assessment approach, the construction greenhouse gas calculations have included all aspects of the amended project. This includes using the emission factors sourced from the *2021 National Greenhouse Accounts Factors document* (Department of Industry, Science, Energy and Resources, 2021).

6.16.2. Assessment of amendments and refinements

6.16.2.1. Construction impacts

Impacts on the project from climate change

The impact on the amended project from climate change, during construction, is the same as that presented *Technical Report 18 - Greenhouse Gas Assessment* prepared for the EIS.

Impacts on climate change from the project

Scope 1 emissions concerned with the consumption of fuels, oils and greases estimated for the amended project construction activities are approximately 65 per cent higher than presented in the EIS. This is largely due to an increase in the estimated diesel consumption rate attributed to the increased construction worker number estimates and the number of accommodation facilities and construction compounds potentially using diesel for power supply. Scope 1 emissions would aim to be reduced through ongoing construction planning, including opportunities for local grid connections instead of reliance on diesel (in accordance with mitigation measures AQ6) and the implementation of mitigation measures CC2 and CC4 (refer to Appendix B (Updated mitigation measures)).

Scope 2 emissions relating to electricity consumption for the amended project construction activities have decreased by approximately 30 per cent of the estimate presented in the EIS due to the removal of the Tumbarumba worker accommodation facility, which was proposed to be connected to the electricity grid rather than powered by diesel generators, and a reduction in the estimated electricity demand for the substation work sites is also expected.

Scope 3 emissions from construction of the amended project predominantly relate to the energy embodied in the materials of construction, which are 1.3 per cent higher than those presented in the EIS due the increase in the transmission line length from 360 kilometres to 365 kilometres. Emissions associated with the production and supply of fuels have increased compared to the estimates presented in the EIS, partially due to the increased fuel consumption estimates.

Table 6-54 outlines the updated estimated GHG emissions during construction for all aspects of the amended project.

Table 6-54 Estimated GHG emissions during construction of the amended project

Scope	Activity/source	Estimated emissions (t CO_2-e)	
		Total 2.5 year construction period	Annual average
1	Diesel consumption - off-road and stationary	89,017	35,607
	Diesel consumption - mobile/on-road	2,169	868
	Unleaded fuel consumption	974	389
	Avgas consumption	362	145
	Consumption of oils (lubricants)	18.7	7.5
	Consumption of greases	2.4	0.9
Total Scope 1		***92,543***	***37,017***
2	Electricity consumption	1,264	505
Total Scope 2		***1,264***	***505***
3	Employee commuting	872	349
	Extraction and production of diesel consumed	4,676	1,870
	Extraction and production of petrol consumed	50	20
	Extraction and production of Avgas consumed	19	7
	Extraction and production of oils/greases consumed	7	3
	Extraction and production of purchased materials- steel	69,849	27,940
	Extraction and production of purchased materials- concrete	157,436	62,974
	Extraction and production of purchased materials- copper	1,008	403
	Extraction and production of purchased materials- aluminium	83,899	33,560
	Disposal of solid waste generated	5,554	2,222
Total Scope 3		***323,370***	***129,348***

Table 6-55 outlines the estimated annual average construction GHG emissions from the amended project and its contribution to the overall emissions from NSW and Australia. The impact of constructing the amended project on the NSW and national GHG emission loads is negligible, with the annual average emissions representing less than 0.1 per cent of NSW's annual emissions, which is consistent with the conclusion in the EIS.

Table 6-55 Potential contributions to state and national GHG emissions – construction

Year	Estimated Scope 1 and Scope 2 project emissions (t CO_2-e/annum)	Percentage of NSW emissions	Percentage of Australia's emissions
Construction	37,523	0.028%	0.008%

6.16.2.2. Operational impacts

The assessment of climate change impacts on the operation of the amended project and impacts on climate change from the amended project (operational emissions) are the same as those presented in *Technical Report 18 - Greenhouse Gas Assessment* prepared for the EIS.

It should be noted that the estimated transmission losses provided in *Technical Report 18 –Greenhouse Gas Assessment* prepared for the EIS are indicative only for the purpose of estimating GHG emissions. Forecast annual transmission system losses in operations are limited to an approximation of the expected

utilisation of the assets using market modelling results, that is, an approximation of how much power is expected to flow through the lines each year. Since these results are based on assumed future outcomes in the energy market, the results are sensitive to daily and seasonal patterns in demand and generation (solar and wind), the timeline for new generation to be built and existing generation (eg coal) to retire, and events such as major network outages, all of which may have material impacts on the estimated annual losses.

Actual generation dispatch is dynamic and determined by complex market interactions that inherently introduce a high degree of model uncertainty. The location of generation and its relative distance to loads is the key factor determining transmission losses, meaning that varying the assumed location, scale and pace of renewable generation developments (for example, renewable energy zones) will affect forecast losses.

By integrating the new HumeLink transmission lines into Transgrid's network, a proportion of power flows that would otherwise flow in the existing parallel circuits will be transferred onto the new HumeLink transmission lines. This means the reported transmission losses should not be interpreted as being in addition to the net transmission losses in Transgrid's network. Likewise, the corresponding GHG emissions during operations due to transmission losses should not be interpreted as being in addition to Transgrid's total forecast Scope 2 emissions after commissioning of the project.

6.16.3. Updated mitigation measures

There have been two minor changes to the climate change and greenhouse gas mitigation measures presented in the EIS. Mitigation measure CC2 has been revised to apply to the applicable worker accommodation facilities proposed for the amended project, while mitigation measure CC5 has a minor clarification. The updates are shown in **green** and ~~**strikethrough**~~ in Table 6-56. The consolidated list of mitigation measures for the amended project is provided in Appendix B (Updated mitigation measures).

Table 6-56 Summary of revised climate change and greenhouse gas mitigation measures

Reference	Impact	Mitigation measures	Timing	Relevant location
CC2	GHG emissions	Options that will be considered during **Infrastructure Sustainability Council (**ISC**)** rating design review include energy efficient and passive design features for substation and worker accommodation facility buildings including air conditioning, lighting, low-flow fittings and solar power.	Detailed design	Substations and worker accommodation ~~**facility**~~ **facilities**
CC5	GHG emissions	**Sulfur hexafluoride (**SF_6**) gas** emissions will be minimised through **existing Transgrid** leakage detection monitoring programs, maintenance and end of life dismantling procedures.	Operation	Substations

6.17. Waste

6.17.1. Approach to assessment

Chapter 23 (Waste) of the EIS provides the waste assessment approach and methodology for the project. An updated assessment of waste impacts has been prepared to assess impacts from the proposed amendments and refinements to the project.

There has been no change to the legislative and policy context presented in the EIS. The assessment has been prepared in accordance with the methodology outlined within the EIS. The assessment for the amended project includes assessment of impacts from additional construction compounds and worker accommodation facilities and access tracks.

6.17.2. Assessment of amendments and refinements

Waste streams for the amended project are consistent with those provided in Chapter 23 (Waste) of the EIS.

Nomination of access tracks and inclusion of five temporary worker accommodation facilities as part of the amended project have increased the earthwork volumes since the EIS. Total earthwork volumes for the amended project involve an estimated 1,565,000 cubic metres of cut and 1,855,000 cubic metres of fill, compared to 666,030 cubic metres of cut and 418,270 cubic metres of fill for the EIS project. Further detail on revised earthworks cut and fill volumes are provided in Appendix A (Updated project description). However, it should be noted that revised earthwork volumes exclude topsoil strip. Many construction site areas would also require localised cut to fill operations which will be developed and optimised during further detailed design and construction planning and are not accounted for in the revised earthwork volumes. The indicative earthwork volumes are based on the assumption that cut material can be used as fill for the project.

As per the EIS, a relatively small volume (200,000 to 300,000 cubic metres) of the overall earthwork material may become waste (spoil) and would be managed in accordance with the waste hierarchy, the Excavated Natural Material resource recovery order and/ the *NSW Environment Protection Authority (EPA) Waste Classification Guidelines* (NSW EPA, 2014) for contaminated spoil (refer to Chapter 23 (Waste) of the EIS).

The use of the five temporary worker accommodation facilities during construction would increase the volume of the following waste streams:

- wastewater – 50 to 100 kilolitres per day per worker accommodation facility
- general solid waste (putrescibles) (food scraps, organics, glass and plastic bottles, paper and cardboard) – 2,000 to 2,500 tonnes over the construction period.

Wastewater generated by the additional worker accommodation facilities would either require a connection to the town wastewater network or would be taken offsite for disposal at a suitably licensed facility. Further consultation would be undertaken with local councils to ensure there is sufficient capacity within the nearby wastewater treatment plants to meet the wastewater disposal needs.

While the cut and fill requirements for the amended project, and waste volumes from the additional worker accommodation facilities have increased, there would be no changes to the waste management or resource use approaches outlined in Chapter 23 (Waste) of the EIS during construction.

Operational waste impacts of the amended project are consistent with the impacts described in Chapter 23 (Waste) of the EIS.

6.17.3. Updated mitigation measures

No changes to the waste mitigation measures presented in the EIS are required as a result of the proposed amendments and refinements. The consolidated list of mitigation measures for the amended project is provided in Appendix B (Updated mitigation measures).

6.18. Cumulative impacts

6.18.1. Approach to assessment

Chapter 25 (Cumulative impacts) of the EIS provides the cumulative impact assessment approach and methodology for the project. The assessment and evaluation of potential cumulative impacts was based on issue-specific and combined cumulative impact assessment approaches as described in the *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPE, 2022c).

Issue-specific cumulative impact assessments include the cumulative impacts of the project on key matters, such as an increase in traffic, with other relevant future projects. Combined cumulative impact assessments include the effect of the different cumulative impacts (eg an increase in traffic, dust and noise in one area) of the project on key matters, sensitive receivers/receptors or important features with other relevant future projects. Due to the extent of information available at the time of the assessment and uncertainties associated with timing and determination of relevant future projects, the cumulative impact assessment was qualitative, in accordance with the *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPE, 2022c).

An updated cumulative impact assessment for the amended project has been prepared in accordance with the methodology outlined within the EIS. This has included an updated search for relevant new projects undertaken on 25 January 2024.

Throughout January to March 2024, Transgrid also sought information from the Department of Defence in relation to the Royal Australian Air Force (RAAF) Base Wagga Redevelopment and Kapooka Military Area Redevelopment (part of the Riverina Redevelopment Program). The RAAF Base Wagga Redevelopment is about 10 kilometres away, while Kapooka Military Area Redevelopment is approximately 7.5 kilometres away from the amended project footprint.

The Riverina Redevelopment Program includes the construction of new accommodation and training facilities, refurbishment and upgrading of existing buildings such as training and communal facilities, performing remediation works, and upgrading infrastructure services. The construction period is estimated to be seven years, commencing late 2024. However, the detailed scope of the redevelopment and precise construction timing remains are still uncertain. As a result, the interaction with the amended project remains unclear, making it not possible to determine the potential for cumulative impacts with the amended project.

A forum (Riverina Murray Major Infrastructure Projects Roundtable) held by Regional NSW has been attended by Transgrid during the development of RAAF Base Wagga Redevelopment and Kapooka Military Area Redevelopment over a period of 18 months in an effort to minimise cumulative impacts, in particular with relation to workforce required for both projects. Revised mitigation measure CI2 will be implemented during further design development and construction to manage potential cumulative project between the RAAF Base Wagga Redevelopment and Kapooka Military Area Redevelopment and the amended project.

6.18.1.1. Additional projects with potential for cumulative impacts

Relevant additional future projects considered to have the potential for cumulative impacts with the construction and operation of HumeLink were identified through updated searches and checked against the amended project footprint, are listed in Table 6-57 and shown in Figure 6-18. As described in Chapter 4 (Project description – construction) of the EIS, construction of HumeLink is expected to commence in 2024 and the project is expected to be fully operational in 2026. It is anticipated that overall construction would take about 2.5 years.

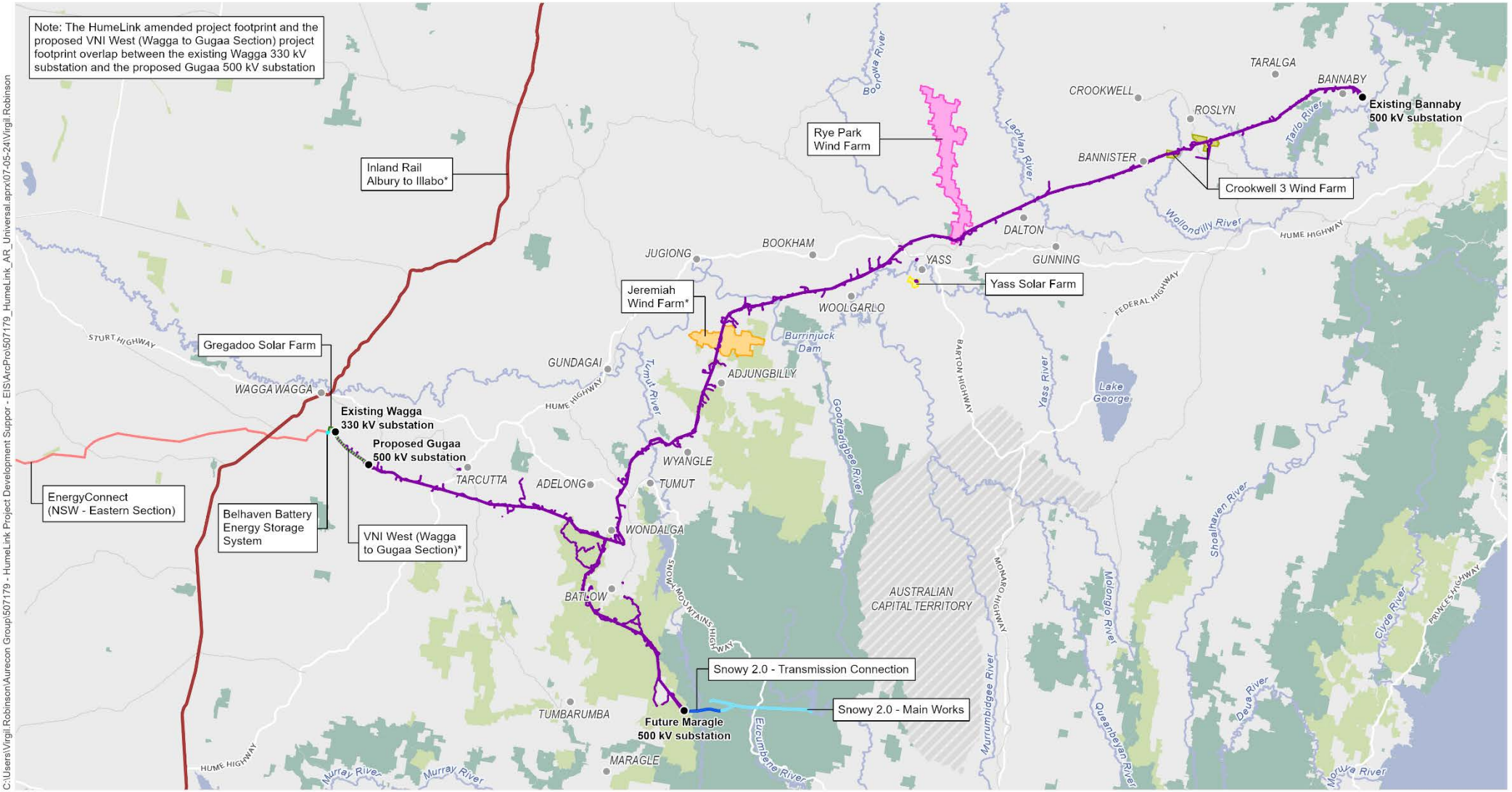
Although additional information is now available for the VNI West project since the exhibition of the EIS, the cumulative impacts of VNI West with the amended project are not yet able to be determined due to the VNI West project being in the early route refinement and scoping stage with impact assessment information not yet publicly available (at the time of drafting). While there is the likelihood for overlapping or consecutive construction programs, cumulative impacts would be addressed under the VNI West planning approval. Mitigation measure CI1 would ensure coordination and engagement on future projects to minimise cumulative impacts.

In addition to the relevant future projects identified in Table 6-57, two additional proposed renewable energy projects were identified within the cumulative impact study area since the exhibition of the EIS. These projects include Wattle Creek Solar Farm and Wattle Creek Battery Energy Storage System which are located about 15 kilometres north-west of the amended project within the Upper Lachlan Shire Council LGA. While there is the likelihood for overlapping or consecutive construction programs, impacts associated with the above proposed renewable energy projects are expected to be localised and minimised with the implementation of mitigation measures. Notably, the local road network of the two additional proposed renewable energy projects do not overlap with HumeLink, hence reducing the potential for cumulative traffic impacts. As such, these projects did not meet the location and scale criteria as detailed in Chapter 25 (Cumulative impacts) of the EIS and were not considered further as relevant future projects.

Table 6-57 Additional/updated projects with the potential for cumulative impacts

Relevant future project	Proponent	Scope	Location in relation to amended project footprint	Status/timeframe/overlap
Victoria to NSW Interconnector West (VNI West)* https://www.transgrid.com.au/projects-innovation/vni-west	Transgrid	VNI West includes additional line and substation augmentation work between the existing Wagga substation and proposed Gugaa substation. This work is required to complete the 500 kV connection in this section of the transmission network. Design of this work is still in progress and cumulative impacts will be addressed under the VNI West planning approval.	The preferred corridor option (Transgrid, 2024b) runs from Transgrid's Dinawan substation north of Jerilderie in NSW to new substations proposed near Kerang and Bulgana in Victoria. The VNI West Project will intersect the HumeLink amended project footprint between the existing Wagga 330 kV substation and proposed Gugaa 500 kV substation.	• VNI West was included in the EIS cumulative impact assessment however further details have been made publicly available from January 2024 • VNI West route options within the preferred corridor are being developed and consultation is currently underway • the Regulatory Investment Test for Transmission process is complete • construction proposed to begin in 2026 with commissioning in 2028 • potential consecutive construction programs between the amended project and VNI West.
Belhaven Battery Energy Storage System* https://www.planningportal.nsw.gov.au/major-projects/projects/belhaven-battery-energy-storage-system	Vena Energy Services (Australia) Pty Ltd	Construction and operation of a 400 MW/800 MWh battery energy storage system including transmission connection and associated infrastructure	Proposal site is located about 1.5 km west of the Wagga 330 kV substation, and there may be an underground connection to the substation.	• new project added to cumulative impact assessment due to further information publicly available since preparation of the EIS • scoping report lodged March 2023 and SEARs received 18 May 2023 • EIS preparation currently underway • construction is proposed to begin in 2025 through to 2026 • potential consecutive construction programs with the amended project • scoping report for this proposal also identified HumeLink as a project to be considered further for cumulative impacts.
Yass Solar Farm* https://www.planningportal.nsw.gov.au/major-projects/projects/yass-solar-farm-0	International Power (Australia) Pty Ltd	The construction, operation and decommissioning of a 100 MW solar photovoltaic energy generating facility with an associated battery energy storage system	The proposed site surrounds Yass substation compound (C10) and is located about 4 km south of the Yass accommodation facility and compound (AC05). The distance to HumeLink's transmission line corridor is about 7 km west.	• scoping report lodged November 2023 and SEARs received 22 December 2023 • EIS preparation currently underway • construction is proposed to commence in 2025 for 24 months • potential overlapping construction programs with the amended project.

Note: * Projects subject to planning approval



Amended project footprint
National park and reserve
State forest
Waterbody
Waterway
Major road
Railway
Substation

Relevant future projects

Belhaven Battery Energy Storage System
Crookwell 3 Wind Farm
EnergyConnect (NSW - Eastern Section)
Gregadoo Solar Farm
Inland Rail Albury to Illabo*
Jeremiah Wind Farm*
Rye Park Wind Farm
Snowy 2.0 - Main Works
Snowy 2.0 - Transmission Connection
VNI West (Wagga to Gugga Section)*
Yass Solar Farm

*Note: Subject to approval

Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:925,000
0 20 40km

Projection: GDA 1994 MGA Zone 55

HumeLink

FIGURE 6-18: Projects with potential for cumulative impacts with the amended project footprint

6.18.2. Assessment of amendments and refinements

The potential cumulative impacts that may occur for the projects outlined in Table 6-57 are discussed in the following sections for each of the relevant projects. Consideration of any changes in the cumulative impacts between the relevant future projects presented in Chapter 25 (Cumulative impacts) of the EIS and the amended project has also been undertaken and detailed below as required.

The potential issue-specific cumulative impacts that may occur with each relevant additional future project are identified in Table 6-58 and discussed in the following sections. Full assessments are provided in the addendum and revised technical reports prepared to support the Amendment Report.

Table 6-58 Potential cumulative impacts for each relevant additional future project

Relevant additional future project	Type of cumulative impact with the amended project														
	Biodiversity	Aboriginal heritage	Non-Aboriginal heritage	Land use and property	Economic	Social	Landscape character and visual amenity	Noise and vibration	Soils, geology, and contamination	Surface water and groundwater quality	Hydrology and flooding	Hazards and risks	Traffic, transport and access	Air quality	Waste
Belhaven Battery Energy Storage System*															
Yass Solar Farm*															

Key:

Potential for cumulative impact, including positive and negative impacts

Negligible cumulative impact or unable to be determined at this stage due to limited publicly available information

* Projects subject to planning approval

6.18.2.1. Biodiversity

The proposed Belhaven Battery Energy Storage System, Yass Solar Farm and the amended project have the potential to result in localised cumulative biodiversity impacts. These proposed projects intersect the project footprint in areas where biodiversity impacts could be compounded.

Table 6-59 details threatened ecological communities (TEC) and species listed under the *Biodiversity Conservation Act 2016* (BC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) that have the potential to be impacted by the amended project and the proposed Belhaven Battery Energy Storage System and Yass Solar Farm.

Table 6-59 TECs and threatened species with potential for cumulative biodiversity impacts

TEC or threatened species	Conservation status[1]	Belhaven Battery Energy Storage System[2,4]	Yass Solar Farm[3,4]
White Box-Yellow Box-Blakely's Red Gum Grassy Box Woodland and Derived Native Grassland	BC Act – CE EPBC Act – CE	Known to occur in development area	Known to occur in development area
Superb Parrot (*Polytelis swainsonii*)	BC Act – V EPBC Act – V	Known to occur in development area	-
Golden Sun Moth (*Synemon plana*)	BC Act – V EPBC Act – V	-	Known to occur in development area

TEC or threatened species	Conservation status[1]	Belhaven Battery Energy Storage System[2,4]	Yass Solar Farm[3,4]
Striped Legless Lizard (*Delma impar*)	BC Act – V EPBC Act – V	-	Known to occur in development area

Note:
1. Conservation status listings: CE - critically endangered; E - endangered; V – vulnerable.
2. Sourced from Belhaven Battery Energy Storage System Scoping Report (Ramboll, 2023a).
3. Sourced from *Yass Solar Farm Scoping Report* (Ramboll, 2023b).
4. Project subject to planning approval.

Given the overlap with the relevant additional future projects and amended project footprint, there is the potential for biodiversity impacts within the locality to be compounded by the projects. It is noted that the TEC and threatened species identified in Table 6-59 were also identified as potentially being impacted by the relevant future projects presented in Chapter 25 (Cumulative impacts) of the EIS.

There would be no additional or changed cumulative biodiversity impacts for the relevant future projects presented in Chapter 25 (Cumulative impacts) of the EIS as a result of the amended project.

The avoidance and minimisation measures, along with the offset requirements and mitigation measures for residual impacts detailed in *Technical Report 1 – Revised Biodiversity Development Assessment Report*, along with similar provisions in each individual project specific assessment for the relevant future projects (including Belhaven Battery Energy Storage System and Yass Solar Farm) are considered likely to control the risk of potentially significant cumulative biodiversity impacts in the locality.

6.18.2.2. Aboriginal heritage

There would be no additional or changed cumulative Aboriginal heritage impacts for the relevant future projects presented in Chapter 25 (Cumulative impacts) of the EIS as a result of the amended project.

6.18.2.3. Land use and property

The proposed Belhaven Battery Energy Storage System and the amended project have the potential to result in localised cumulative agricultural land use impacts near the existing Wagga 330 kV substation during operation. The Belhaven Battery Energy Storage System would develop around 25 hectares of cropping land use and removal of farm infrastructure. However, given the relatively small area of impact in this location compared to the large scale of regional agricultural activity, the overall cumulative impact is minor.

The proposed Yass Solar Farm and the amended project would have the potential to result in localised cumulative land use and property impact near the Yass region during construction and operation. Yass Solar Farm would permanently change around 340 hectares of existing grazing modified pastures land use and require the removal of farm infrastructure and environmental assets such as dams and tree windbreaks. However, given the concentration of impacts and alignment of timeframes of the proposed Yass Solar Farm and amended project, the cumulative impacts would be minor or moderate for landowners near the Yass substation.

With the additional 81.4 hectares of Bago State Forest being impacted by the amended project, there would be an increase in cumulative impacts on forestry land use and property in the Snowy Valleys LGA. Similar to the EIS, cumulative impacts would be limited to Bago State Forest, where there would be a combined impact on about 343.4 hectares (ie about 299.4 hectares impacted by the amended project and about 44 hectares by the Snowy 2.0 – Transmission Connection Project). The combined area of impact equates to around 0.7 per cent of the total area of Bago State Forest, which has increased from 0.5 per

cent from the EIS. Cumulative land use impacts would be associated with the loss of forestry through vegetation clearing and operational restrictions for the projects. Whereas cumulative impacts on property would be associated with the establishment of easements. Given the relatively minor increase in the combined area of impact from the EIS, the overall scale of impact is unlikely to change.

There would be no other additional or changed cumulative land use and property impacts for the relevant future projects presented in Chapter 25 (Cumulative impacts) of the EIS as a result of the amended project.

6.18.2.4. Economic

The construction of the amended project, proposed Belhaven Battery Energy Storage System and proposed Yass Solar Farm would result in positive economic cumulative impacts at a regional, State and national level. The positive impacts would be associated with local employment opportunities, wage expenditure and increased economic activity.

However, there is potential for negative economic cumulative impacts from the amended project, proposed Belhaven Battery Energy Storage System and proposed Yass Solar Farm, which may have overlapping construction programs. The negative cumulative impacts would be associated with demand for local workers, which may result in temporary labour shortages that would need to be met with commuter workers or internal migration in and around the Wagga Wagga region.

The migration of outside workers could then increase the demand for amenity, services and accommodation. It is estimated that the proposed Belhaven Battery Energy Storage System and proposed Yass Solar Farm would require up to 100 and 150 full-time employees, respectively, during peak construction period. Additionally, it is estimated that 70 to 80 per cent of both construction workers from the proposed Belhaven Battery Energy Storage System and Yass Solar Farm would require accommodation during this time.

However, associated negative cumulative impacts are not anticipated as existing accommodation facilities near Wagga Wagga and Yass should be sufficient to accommodate the combined workers of the amended project and relevant additional future projects. Furthermore, Yass accommodation facility and compound (AC05) would further alleviate any risks of accommodation shortages in Yass due to the amended project and Yass Solar Farm (refer to Section 3.3).

In addition, the negative cumulative economic impacts discussed in Section 25.5.4 of the EIS are likely to be lower for the amended project compared to the EIS. With the inclusion of temporary worker accommodation facilities as part of the amended project, the cumulative increase in demand for rental housing and short-term accommodation is expected to be reduced for the Wagga Wagga City and Snowy Valleys LGA.

6.18.2.5. Social

The construction and operation of the amended project, proposed Belhaven Battery Energy Storage System and proposed Yass Solar Farm could potentially result in negative cumulative social impacts. The timing and scale of impact would depend on the overlap of the construction programs. Potential negative cumulative social impacts could be associated with:

- changes to accessibility (eg related to construction traffic)
- health and wellbeing
- surroundings through the continuation of major construction works

- built environment changes in relative proximity to the urban areas of Wagga Wagga and Yass, respectively.

The scale of negative cumulative social impacts would generally be minor. However, if the proposed project construction periods overlap, impacts may be exacerbated but would remain low. The identified impacts would be managed by implementing the mitigation measures detailed for other environmental matters, including noise and vibration, traffic, transport and access, as well as the implementation of equivalent mitigation measures as part of the delivery of the relevant additional future projects.

It is likely that the amended project and relevant additional future projects would also result in positive cumulative social impacts similar to that described in the EIS. These positive impacts would be associated improved livelihoods for business operators and workers in the surrounding social locality due to increased patronage and access to employment and training.

There would be no additional cumulative social impacts for the relevant future projects presented in Chapter 25 (Cumulative impacts) of the EIS as a result of the amended project. However, negative cumulative social impacts associated with the demand for rental housing and short-term accommodation would likely be reduced, as discussed in Section 6.18.2.4.

6.18.2.6. Landscape character and visual amenity

Potential cumulative landscape character and visual impacts from the amended project and relevant additional future projects are expected to occur during construction and operation. The impacts would generally be associated with landform changes, removal of vegetation and/or the introduction of new or additional electricity infrastructure. However, cumulative impacts would occur in landscapes where there is existing electricity infrastructure. As such, impacts are expected to be minimal and will be managed by implementing the landscape character and visual amenity mitigation measures detailed in Appendix B (Updated mitigation measures) as well as equivalent mitigation measures as part of the delivery of the relevant additional future projects.

Table 6-60 provides further details on the location and timing of the potential cumulative landscape character and visual impacts from the amended project and relevant additional future projects.

Table 6-60 Potential cumulative landscape character and visual impacts from the amended project and relevant additional future projects

Relevant additional future project	Landscape subject to cumulative impacts	Views subject to cumulative impacts	Timing of cumulative impact
Belhaven Battery Energy Storage System*	Rural fringe landscape	Views from Boiling Down Road	Construction and operation
Yass Solar Farm*	Black range Undulating rural hills and ridges landscape	No visual impact identified	Construction and operation

Note:

* Project subject to planning approval

There would be no additional or changed cumulative landscape character and visual impacts for the relevant future projects presented in Chapter 25 (Cumulative impacts) of the EIS as a result of the amended project.

6.18.2.7. Noise and vibration

Potential cumulative and/or consecutive noise impacts could occur from the construction of the amended project and construction of the proposed Belhaven Battery Energy Storage System and proposed Yass Solar Farm. The extent of impact would depend on the overlap of construction programs, the work being undertaken and the level of noise impacts that are experienced. Where there is no overlap or only a brief overlap in construction programs, impacts have been characterised as 'consecutive noise impacts' as impacts would be from successive projects in an area for an extended period.

For the proposed Belhaven Battery Energy Storage System, the overlap of the construction program with the amended project may occur based on the indicative proposed construction timing in the *Belhaven Battery Energy Storage System Scoping Report* (Ramboll, 2023a). Additionally, the proposed Belhaven Battery Energy Storage System may interface with the demobilisation of EnergyConnect (NSW – Eastern Section) work at the existing Wagga 330 kV substation. Construction of the amended project, proposed Belhaven Battery Energy Storage System and EnergyConnect could result in cumulative and/or consecutive construction noise impacts. However, the impact would be limited to nearby receivers around the Wagga 330 kV substation.

In addition, the amended project and proposed Yass Solar Farm could potentially result in cumulative and/or consecutive noise impacts based on the indicative proposed construction timing in the *Yass Solar Farm Scoping Report* (Ramboll, 2023b). However, these impacts would be limited to nearby receivers around the Yass substation compound (C10).

Potential cumulative and consecutive construction noise impacts will be managed by implementing the noise mitigation measures detailed in Appendix B (Updated mitigation measures) as well as equivalent mitigation measures as part of the delivery of the relevant additional future projects.

Based on the information publicly available, no cumulative operational noise impacts are expected from the amended project and relevant additional future projects.

There would be no additional or changed cumulative and/or consecutive noise impacts for the relevant future projects presented in Chapter 25 (Cumulative impacts) of the EIS as a result of the amended project.

6.18.2.8. Traffic, transport and access

The relevant additional future projects and the amended project could potentially have cumulative traffic impacts due to overlapping construction programs and likely use of similar construction access routes. Potential cumulative traffic impacts would be limited to the overlapping construction phases and would be associated with increased additional construction traffic on the surrounding road network.

The potential cumulative traffic impacts between the amended project and proposed Belhaven Battery Energy Storage System are expected to be limited to Ashford Road and Boiling Down Road. However, given the substantial residual capacity available on these roads, any traffic impacts resulting from simultaneous peak construction work of projects are considered manageable within the existing road network capacity and with the implementation of standard traffic management measures included in Appendix B (Updated mitigation measures).

Similarly, the cumulative impacts between the amended project and proposed Yass Solar Farm are likely to be limited to the Yass area, particularly on State and regional roads connecting Yass substation, as well as local roads including Perry Street and Grand Junction Road. As such, the cumulative traffic impacts of the

amended project and proposed Yass Solar Farm are considered manageable within the existing road network capacity and with the implementation of standard traffic management measures included in Appendix B (Updated mitigation measures).

There would be no additional or changed cumulative traffic impacts for the relevant future projects presented in Chapter 25 (Cumulative impacts) of the EIS as a result of the amended project.

6.18.2.9. Air quality

The proposed Belhaven Battery Energy Storage System and Yass Solar Farm have the potential to result in cumulative construction air quality impacts with the amended project. These impacts would be associated with dust generation and construction vehicle and plant emissions during potential overlapping construction programs. However, it is expected that potential cumulative impacts would be minimised through the implementation of an Air Quality Management Plan and air quality mitigation measures detailed in Appendix B (Updated mitigation measures).

Minimal (if any) cumulative impacts are anticipated during operation as result of the relevant additional future projects and the amended project due to the limited operational emissions anticipated for each project.

There would be no additional or changed cumulative air quality impacts for the relevant future projects presented in Chapter 25 (Cumulative impacts) of the EIS as a result of the amended project.

6.18.3. Combined cumulative impacts

Based on the outcomes of the cumulative impact assessment in Chapter 25 (Cumulative impacts) of the EIS and including the proposed Belhaven Battery Energy Storage System and proposed Yass Solar Farm, there is the potential for additional combined cumulative impacts to occur within the Wagga Wagga City LGA and Yass Valley LGA during construction and operation of HumeLink.

The potential additional combined cumulative impacts would be both positive and negative. The positive combined cumulative impacts would likely be associated with improved livelihoods for business operators and workers in the surrounding region due to increased patronage and access to employment.

The negative combined cumulative impacts as a result of the amendments to the project and proposed Belhaven Battery Energy Storage System and proposed Yass Solar Farm would likely be associated with:

- changes to accessibility due to increased construction traffic
- increased impacts on amenity due to increased noise and/or dust impacts during construction.

Given the types of combined cumulative impacts that could occur during construction, there is potential for construction fatigue to be experienced by nearby receivers near the amended project and relevant additional future projects. However, with the implementation of mitigation and management measures for the project (refer to Appendix B (Updated mitigation measures)) and equivalent mitigation measures as part of the delivery of the proposed Belhaven Battery Energy Storage System and proposed Yass Solar Farm, it is expected that the combined impacts that could potentially result in construction fatigue would be managed. Additionally, coordination and engagement with proponents and/or construction contractors of relevant additional future projects will occur during detailed design and construction in accordance with mitigation measure CI1 to confirm the potential cumulative impacts and timing of activities that have potential cumulative impacts.

In addition, the negative combined cumulative increase in demand for rental housing and accommodation in the Wagga Wagga City LGA discussed in Section 25.6 of the EIS is likely to be less for the amended project compared to the EIS. With the inclusion of temporary worker accommodation facilities as part of the amended project, the cumulative increase in demand for rental housing and short-term accommodation is expected to be reduced for the Wagga Wagga City LGA.

6.18.4. Updated mitigation measures

The approach to the avoidance/minimisation and management of cumulative impacts remains consistent with the description in Chapter 25 (Cumulative impacts) of the EIS. However, minor amendments have been made to mitigation measure CI2 to include consideration of the Kapooka Military Area Redevelopment. The updates are shown in **green** and ~~**strikethrough**~~ in Table 6-61. The consolidated list of mitigation measures for the amended project is provided in Appendix B (Updated mitigation measures).

Table 6-61 Summary of revised cumulative impact mitigation measures

Reference	Impact	Mitigation measures	Timing	Relevant location
CI2	Occurrence of cumulative impacts	Engagement with the Department of Defence and Transport for NSW will be carried out during detailed design and construction to confirm the potential for cumulative impacts from the RAAF Base Wagga Redevelopment**, Kapooka Military Area Redevelopment** and work associated with the *Tumut to Hume Highway (Snowy Mountains Highway and Gocup Road) Corridor Strategy* (Transport for NSW, 2016). Mitigation strategies will be developed if potential cumulative impacts are identified.	Detailed design and construction	All locations

7. Justification of amended project and conclusion

This chapter addresses the justification and evaluation of the amended project as a whole, having regard to its economic, environmental and social impacts and the principles of Ecologically Sustainable Development (ESD) as per the *State significant infrastructure guidelines – preparing an amendment report* (DPE, 2022a). Additional information is also provided below on aspects that more specifically relate to the project amendments and refinements, and how the amended project differs to the EIS project, where appropriate. This chapter should be read in conjunction with the more comprehensive information provided in Chapter 27 (Project justification and evaluation) of the Environmental Impact Statement (EIS). Overall, the amended project is considered substantially consistent with the justification and evaluation provided in the EIS.

7.1. Evaluation of the merits of the amended project

7.1.1. Need for the amended project and consistency with strategic context

7.1.1.1. Amended project

HumeLink (as presented in the EIS and as amended) has been developed in the strategic context of a changing Australian energy environment and the need to develop infrastructure required to respond to these changes. In particular, this includes the influence of global changes and the transition to -low-emission energy generation as well as relevant government and other regulatory and industry strategies, policies and plans.

HumeLink (inclusive of amendments described in Chapter 3 (Description of the amended project)) is a key component of Australia's energy transition to -low-emission energy generation. It would provide additional capacity for new generation, primarily renewable wind and solar generation, in southern NSW and improve wholesale market competition. HumeLink would, therefore improve access to affordable electricity and lower electricity costs in the longer term. It would also help unlock the full potential of the Snowy 2.0 project by increasing transmission capacity and enable greater sharing of energy across the eastern states.

Chapter 2 (Strategic context and project need) of the EIS outlines the strategic planning response to the identified challenges facing the existing energy market, including consideration of HumeLink against both NSW and Commonwealth government policy contexts such as its alignment with the:

- *NSW Transmission Infrastructure Strategy* (DPE, 2018)
- *NSW Electricity Strategy* (DPIE, 2019)
- *NSW Government's Net-Zero Plan Stage 1: 2020–2030* (DPIE, 2020a)
- *2022 Integrated System Plan* (2022 ISP, Australian Energy Market Operator (AEMO), 2022)
- Commonwealth government's Climate change policy.

The 2022 ISP identified the latest delivery date for HumeLink as July 2026 (AEMO, 2022).

Since the EIS public exhibition, the *draft 2024 Integrated System Plan* (draft 2024 ISP; AEMO, 2024) has been released, which provided updated timing and staging, including targeting the northern circuit of HumeLink (Wagga Wagga to Bannaby) to be operational by July 2026 and the southern circuit of HumeLink (connecting to Maragle) to be operational by December 2026. The analysis in the draft 2024 ISP confirms that HumeLink continues to provide net benefits to the market and remains a key component of the ISP Optimal Development Path (ODP).

7.1.1.2. Changes to the transmission line corridor

Prior to, and during public exhibition of the EIS, Transgrid committed to investigate the feasibility of a western route through Green Hills State Forest following landowner, community and stakeholder feedback, and engagement with Forestry Corporation of NSW (FCNSW). As a result, Transgrid has adopted an alternative alignment for the transmission line corridor between Wondalga and the future Maragle 500 kV substation through the Green Hills State Forest. The Green Hills corridor amendment is detailed in Chapter 3 (Description of the amended project). The Green Hills corridor amendment would provide the following advantages compared to the EIS project:

- supports an alternative transmission line corridor proposed by the local community
- aligns with NSW Government principles on placing transmission infrastructure on public land where feasible
- avoids private property impacts on landowners to the east of Batlow
- reduces landscape character and visual amenity impacts
- reduces the extent of impacts to native vegetation
- increases the distance away from the heritage listed Kosciuszko National Park for this section of the transmission line corridor
- provides opportunities to utilise established previously disturbed forestry tracks for construction and operation purposes resulting in greatly reduced earthworks and more efficient access.

In addition to the Green Hills corridor amendment, nine minor changes to the transmission line corridor are also proposed as alternative routes to those presented in the EIS. The minor changes are in response to further engagement with easement affected landowners and design development since public exhibition of the EIS. These changes have facilitated a more prudent and efficient transmission line corridor design that considers concerns from easement affected landowners where practicable.

7.1.2. Economic, environmental and social impacts

This section summarises the economic, environmental and social impacts of the amended project incorporating the relevant findings from the EIS and any new findings resulting from the amendments and refinements. Chapter 6 (Assessment of impacts) of this report provides further detail on how the amendments and refinements have resulted in changes in impacts compared to the EIS project.

7.1.2.1. Key economic impacts

Overall, the economic impacts presented within the EIS for the HumeLink project remain substantially consistent, with some variances in the construction related impacts and updated information regarding economic benefits associated with the operation of the amended project.

Construction

The following key economic impacts specific to the amended project during construction include:

- positive economic impacts associated with:
  - generation of economic activity from construction workers spending at local businesses and retailers in the surrounding local government areas (including spending on goods and services), as well as an increase in visitation and tourism from family and friends of construction workers
  - employment of up to 1,600 full-time equivalent construction workers across multiple work fronts during peak construction

- negative economic impacts associated with temporary disruption to existing land uses associated with construction activities, which has potential to result in impacts to agricultural and forestry productivity.

Any land not required to support operation of the amended project would be returned to its previous condition or as agreed with the landowner following construction.

The amended project would also have a reduced temporary impact on the local rental market and short-term tourist accommodation, compared to the EIS project, as construction workers would now be housed in additional temporary worker accommodation facilities.

Operation

The net market benefits associated with HumeLink has increased since public exhibition of the EIS, from $491 million (Transgrid, 2021) to more than $1 billion (Transgrid, 2024a). This significant increase in market benefits is driven by the latest AEMO information on timing of energy generation projects, and emissions targets and renewable energy policies changing the inputs and assessment for AEMO benefits modelling.

As with the EIS project, the amended project would have a local level economic impact where permanent property adjustments are required. The total permanent loss of about 615 hectares of forestry land (primarily production native forest) that would result from the amended project equates to a loss of $15.5 million in net present value over 70 years and could result in a loss of $31 million when including multiplier impacts. The increase in the cost to forestry in net present value terms over 70 years from the EIS estimate is around $4.5 million, and almost $9.3 million including multiplier impacts, which is primarily due to the Green Hills corridor amendment. The value of total permanent agricultural production loss for the amended project equates to $350,106 per annum, which is $200,106 per annum more than the EIS project.

Landowners affected by any direct permanent loss of forestry, productive agricultural land or other existing land uses for any permanent property adjustments would be compensated under the *Land Acquisition (Just Terms Compensation) Act 1991*. Transgrid may also compensate forestry operators for any lost plantation forestry land through the provision of replacement land, which would help minimise the reduction in forestry land available for timber supply.

7.1.2.2. Key environmental impacts

Overall, the environmental impacts associated with the amended project are substantially consistent in nature and scale with those presented in the EIS. Specific environmental impacts that have changed from the EIS are summarised below.

Construction

The key potential impacts on the biophysical environment during construction of the amended project are biodiversity impacts. The route has been refined to avoid and minimise impacts to biodiversity where possible, however there is an increase in the updated indicative disturbance area (largely due to nomination of additional access tracks required for the amended project) which would result in an overall increase in the area of potential direct biodiversity impacts compared to those presented within the EIS. Direct impacts on biodiversity for the amended project include:

- about 866 hectares of native vegetation

- five *Biodiversity Conservation Act 2016* (BC Act) listed threatened ecological communities (TECs), two of which are also listed TECs under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- 46 threatened flora species
- 29 threatened fauna species (12 bird, 8 mammal, three reptile, four frog and two insect)
- two endangered fauna populations:
    - Yellow-bellied Glider population on the Bago Plateau
    - Squirrel Glider in the Wagga Wagga City Local Government Area.

Proposed management measures would aim to further avoid, minimise, mitigate and manage impacts on biodiversity. However, there would be some residual impacts that cannot be further mitigated. These residual impacts would be offset in accordance with the Biodiversity Offsets Strategy.

Other impacts from the amended project on the biophysical environment, including, soil, air quality, flooding and water quality (including surface water and groundwater), would be temporary during construction and limited in extent (refer to Chapter 6 (Assessment of impacts) for further information). These impacts will be managed through standard and proven construction management and mitigation measures (refer to Appendix B (Updated mitigation measures)).

Operation

Direct impacts on native vegetation and habitats of threatened species would continue to occur during operation. These impacts would be caused by regular vegetation management, which would be required to maintain vegetation clearance within the easement clearance zone of the new transmission line easement and around substation asset protection zones. However, these impacts would be substantially less than those that would occur during construction and would be minimised through incorporation of measures to enhance or maintain connectivity during detailed design.

7.1.2.3. Key social impacts

Construction

Key social impacts (positive and negative) would be substantially the same as those presented in the EIS. Additional information has been included in relation to project amendments as relevant. Key social impacts (positive and negative) expected during construction of the amended project include:

- positive social impacts associated with:
    - new employment opportunities and skill acquisition for the local community, including Aboriginal people
    - support for local businesses servicing the temporary construction workforce, particularly in locations near new combined worker accommodation facilities and construction compounds
    - potential for increased tourism from temporary workers and their guests
    - reduction in potential impacts associated with the private rental and short-term tourist accommodation market as non-resident workers would be housed in dedicated worker accommodation facilities
    - increased opportunities for community support and investment through Transgrid's community benefits and support initiatives, which would have a positive social impact in the surrounding communities

- negative social impacts associated with:
    - a loss of connection, and change in landscape character and visual amenity, of the surroundings
    - uncertainty about the property acquisition process and creation of new easements is known to lead to some anxiety and stress (this was raised in community submissions on the EIS and addressed in the Submissions Report)
    - amenity impacts, such noise, traffic, visual and dust generation, from construction vehicles and construction work in general
    - sudden increase in worker population in local communities that may impact on social cohesion and strain social infrastructure and goods and services, particularly in smaller towns such as Tarcutta and Batlow
    - potential impact on up to 178 Aboriginal sites within the amended project footprint, of which the majority are stone artefact occurrences and 12 are potential archaeological deposits, including previously recorded sites and new sites identified during HumeLink surveys. The number of sites that could be directly impacted would be confirmed during further detailed design, which would consider opportunities to avoid or minimise impacts
    - changes and restrictions to existing land uses and activities, including some agricultural and forestry land uses and activities as a result of construction, including access tracks, construction compounds and within the transmission line corridor.

It is noted that the five temporary worker accommodation facilities proposed in the amended project were identified in response to community and stakeholder submissions on the EIS project stating concern regarding the potential shortfall of existing accommodation for workers and the resultant impact on local housing, tourism and social infrastructure. As a result, the inclusion of additional worker accommodation facilities in the amended project is considered to reduce negative social impacts compared to the EIS project.

Overall, negative social impacts from construction are expected to be temporary, transient and spread across the amended project footprint and surrounding communities. Transgrid and the construction contractors would continue to actively manage potential impacts and engage with stakeholders on ways to minimise impacts.

Operation

Key social impacts (positive and negative) during operation of the amended project remain consistent with the EIS project including:

- increased opportunities for community support and investment through Transgrid's community benefits and support initiatives, creating a positive social impact in the surrounding communities
- some restrictions to land use activities within the transmission line easement and permanent changes to visual amenity from the new infrastructure would result in negative social impacts associated with operation of the amended project. These impacts would be relatively localised to the landowners within and next to the amended project footprint.

Transgrid will continue to work with local landowners to address potential negative social impacts through the implementation of mitigation measures (refer Appendix B (Updated mitigation measures)). All property acquisitions would occur in accordance with the requirements of the *Land Acquisition (Just Terms Compensation) Act 1991*, and Transgrid would seek to reach agreement with owners on the compensation payable for the acquisition of their interest(s) in land.

7.1.2.4. Cumulative impacts

The cumulative impact assessment (refer to Chapter 25 (Cumulative impacts) of the EIS and Chapter 6 (Assessment of impacts) of this report) for the amended project identified potential cumulative impacts with respect to biodiversity, Aboriginal heritage, land use and property, economic, social, landscape character and visual, noise and vibration, traffic, transport and access and air quality. However, the combined effect of these cumulative impacts is not considered to be significant. Mitigation measures would be required to address the combined effect of cumulative impacts and would include ongoing coordination and collaboration with other major projects and relevant councils.

7.2. Consideration of principles of ecologically sustainable development

Biophysical, economic and social impacts of the HumeLink project have been assessed in the context of the principles of ecologically sustainable development (ESD)[6]. The consideration of the amended project in relation to the principles of ESD are substantially the same as those presented for the EIS project. The information provided below is an update to the assessment provided in Chapter 27 (Justification) of the EIS to reflect any specific project amendments and/or response to submissions, where relevant.

7.2.1. Precautionary principle

The environmental assessments carried out in preparing the Amendment Report are consistent with accepted scientific and assessment methodologies or good practice and have taken into account relevant statutory and agency requirements and have been informed by consultation with stakeholders including government agencies and the community. The assessments have applied a conservative approach with regard to construction and operational arrangements.

The amended project has been developed to avoid impacts where possible and take into consideration the feedback received on the EIS project during public exhibition. As detailed design is yet to be finalised, a worst-case (conservative) impact assessment has been carried out, and a number of environmental mitigation measures have been revised or proposed to further avoid and minimise risks to the environment. The lack of full scientific certainty has not been used as a reason for postponing measures to prevent environmental degradation.

7.2.2. Intergenerational equity

The principle of intergenerational equity provides that “the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.”

As with the EIS project, the amended project would provide a more secure electricity supply in the -near term and would facilitate the -longer term transition of the energy sector across the NEM to new -low emission energy generation sources, benefiting current and future generations. It would increase economic activity, provide regional job opportunities and assist in unlocking the development of large-scale renewable energy generation. The amended project has been designed to meet the needs of both current

[6] The *Environmental Planning and Assessment Act 1979* (EP&A Act) adopts the definition of ESD contained in section 6(2) of the *Protection of the Environment Administration Act 1991* while the principles of ESD are also set out in clause 3A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

and future generations with a design life of about 50 years (which could be extended to more than 70 years for some assets) and would contribute to an increase in resilience and capacity of the electricity network.

During construction of the amended project, opportunities would be taken to reduce resource and material use and maximise the use of materials with low embodied environmental impact, where feasible. Initiatives to deliver benefits to local communities, including employment opportunities, have also been identified.

7.2.3. Conservation of biological diversity and ecological integrity

The development of the amended project, including corridor amendments, has sought to avoid, minimise and mitigate impacts on biological diversity and ecological integrity associated with the EIS project footprint. This includes additional field investigations and assessment, which have informed the amended project footprint (including the Green Hills corridor amendment) and resulted in improved biodiversity outcomes in many locations.

Where potential impacts cannot be avoided, mitigation measures would be implemented to reduce the impact as far as possible. A Biodiversity Offset Strategy has also been developed to compensate for the residual biodiversity impacts to threatened species or ecosystems impacted by the amended project that are unable to be avoided.

Further avoidance and minimisation of biodiversity impacts will continue during further detailed design and construction planning.

7.2.4. Improved valuation, pricing and incentive mechanisms

The amended project has further minimised some adverse environmental impacts presented in the EIS, through alternative route selection, refined construction planning and design refinements. Additional assessment undertaken for the Amendment Report, as well as feedback received during public exhibition of the EIS, has identified new and improved environmental mitigation measures, with the objective of minimising potential impacts on the surrounding environment. Any project-related decisions considered environmental factors in a cost-effective- way and were guided by the whole--of--life costs of providing goods and services. Biodiversity offset credit costs have also been calculated as a way to value and price residual biodiversity impacts. Transgrid has prepared and would implement a Biodiversity Offset Strategy to address the offset requirements. Additionally, Transgrid is working with local councils to co-design and deliver community programs and projects in consultation with the project communities and stakeholders to provide a positive contribution and legacy. Examples of programs and projects being considered include the deployment of regional telecommunications infrastructure, opportunities to invest in community mental health training, sponsorship of local business awards and events, and establishment of a dedicated community investment fund for the HumeLink Community Partnership Program grant scheme.

7.3. Conclusion

The EIS prepared for the project was placed on public exhibition to provide government agencies and public authorities, local councils, organisations and the community with an opportunity to respond to the project. Since the public exhibition of the EIS, proposed amendments and refinements have been developed (the amended project) and are described in Chapter 3 (Description of the amended project) of this Amendment Report. The project amendments were largely a result of consideration of the issues raised in submissions, feedback received from stakeholders prior to and during the public exhibition of the EIS, and ongoing design and construction methodology development by the construction contractors. Additionally, revised and new mitigation measures were developed in response to issues raised in

submissions and consideration of the proposed amendments and refinements to the project. Further consultation with the community and government agencies and key stakeholders has also been carried out on the amendments and refinements to the project where relevant, to inform the assessment and mitigation of any changed impacts from the amended project.

The amended project, including the revised and new mitigation measures provided in Appendix B (Updated mitigation measures) of this report, would facilitate further avoidance, minimisation or management of potential environmental and social impacts.

HumeLink, as amended, is a priority project for AEMO and the Commonwealth and NSW governments. HumeLink would deliver a more reliable and more sustainable grid by increasing the amount of renewable energy that can be delivered across the national electricity grid, helping to transition Australia to a low carbon future. Not proceeding with HumeLink would reduce the security of the electricity supply in NSW, particularly as coal-fired generators are retired. It would also discourage energy generation and storage investment within the nearby declared and candidate Renewable Energy Zones.

8. References

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