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Ginninderry

ENVIRONMENTAL IMPACT STATEMENT

Upper and Lower Tumut 330 kV Transmission Line Realignment, Ginninderry, ACT

REVISED

March 2026

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Block: 1461, 1462, 1559, 1578, 1586, 1602, 1614, 1634, 1635	District: Belconnen
Block: 10, 33, 43, 47, 63, 64, 72, 85, 87, 88	District: Coree
Block: 1, 6, 7, 9, 13, 14, 18 Section: 20, 3, 3, 3, 21, 21, 25	District: Macnamara
Block: 2, 3 Section: 85	District: Strathnairn
Block: 452, 480, 481, 487, 488	District: Stromlo

Ginninderry

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REVISED

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
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for the Ginninderry Joint Venture

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Report No. 21968_R03
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Executive Summary

This submission to the Australian Capital Territory (ACT) Environment, Planning and Sustainable Development Directorate (EPSDD) comprises a Revised Environmental Impact Statement (EIS) prepared in accordance with the ACT *Planning and Development Act 2007*.

This Revised EIS relates to the proposed Upper and Lower Tumut 330 kilovolt (kV) transmission line realignment (the Proposal), which involves the relocation of part of the Upper and Lower Tumut transmission lines (Lines 1 and 7, respectively) near their point of connection in the ACT in western Belconnen. The relocation involves decommissioning and removal of part of Lines 1 and 7, primarily from within nature reserve, and the construction and operation of replacement transmission lines located to the south of the existing lines, primarily within rural landholdings. The new alignments traverse a combined distance of approximately 11.3 km length (5.7 km for Line 1 and 5.6 km for Line 7) and would replace 12.3 km of existing lines.

Proposed works would be undertaken in both the ACT and New South Wales (NSW). The Proposal and this EIS consider only the ACT portion of the proposed works, except where cross-jurisdictional impacts are relevant (e.g. in relation to transport and traffic impacts). The Proposal is located across 33 different land parcels in the districts of Coree, Stromlo, Belconnen, Macnamara and Strathnairn in the ACT. It is being led by the Ginninderry Joint Venture (GJV) (the Proponent).

The primary objective of the Proposal is to move the existing 330 kV transmission lines out of the future urban area (FUA) of West Belconnen, where the Ginninderry residential development is underway, to increase the availability of housing in the area, particularly affordable housing. Removal of the lines would also improve local amenity by reducing visual impacts on residential areas, and would remove infrastructure from within the Ginninderry Conservation Corridor (GCC), which was established under the West Belconnen Strategic Assessment, and from within other nature reserves such as the Woodstock Nature Reserve. This would allow for improved conservation outcomes and visual amenity in these areas.

The Proposal is anticipated to have a net benefit equivalent to approximately $70 million in present value. These net benefits would be felt by a range of stakeholders including landholders, Transgrid (as the future operator of the assets), and public land users. Removal of the existing transmission lines is anticipated to generate a net landscape amenity benefit for local landholders and public land users in the order of $3.85 million. Transgrid's maintenance costs would also be reduced as the new alignments are shorter than the existing alignments, thereby resulting in a benefit of $70,000 for Transgrid.

For the GJV, there would be substantial costs associated with implementing the Proposal and developing the resulting land parcels that become available for sale. However, these costs would be outweighed by the sale of the new properties and the value uplift on other properties located near the transmission lines being removed. This would generate a net benefit of approximately $65 million for the GJV.

A Scoping Document Application was submitted to the EPSDD on 12 May 2023. A Scoping Document was subsequently issued by the EPSDD on 13 July 2023 which outlined the format and matters to be addressed in the EIS for understanding the potential environmental impacts of the Proposal. This Revised EIS is consistent with the EPSDD's guidelines for the preparation of EISs and addresses the requirements of the Scoping Document.

A referral to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) was submitted for the Proposal on 20 November 2024 (referral number 2024/10058). A separate referral was submitted for the NSW component of the proposed works (referral number 2024/10057). A decision was made on 7 February 2025, with both components being determined not a controlled action.

Although the ACT Bilateral Assessment Agreement was in force at the time of the Scoping Document Application submission, DCCEEW advised the GJV that one or more bilateral agreements cannot be applied to a cross-jurisdictional project, thus the proposed works would need to be considered separately under relevant ACT, NSW and Commonwealth legislation.

The Draft EIS was on public exhibition between May and June 2025. No public comments were received, however a number of entity comments were received.

This Revised EIS presents the findings of the specialist investigations undertaken to assess the potential environmental impacts of the Proposal. It also sets out the changes that have been made to the Proposal to avoid impacts, and the commitments made by the GJV to further minimise and manage potential impacts. It also includes updates made in response to entity comments on the Draft EIS and the Revised EIS (published October 2025).

The Proposal has undergone substantial design iterations over the past several years to minimise impacts on ecology, Aboriginal cultural heritage, visual amenity and landholders. Several route options for the new alignments were initially considered, most of which were ruled out following consultation with relevant landholders (Icon Water, ACT Parks and Conservation Service and private landholders), e.g. due to potential visual impacts and physical impacts on properties or nature reserve.

The final Proposal design (as assessed in this EIS) was identified by these stakeholders as suitable for further consideration. A range of design changes and micro-siting was subsequently undertaken to fine-tune the location of towers and wires to further avoid impacts on ecological values.

The GJV has also committed to implementing a large range of mitigation and management measures to further reduce the potential adverse impacts of the Proposal. These measures will be incorporated into the final design process, the Construction Environment Management Plan, and other plans and documents as relevant.

Despite these avoidance and mitigation efforts, the Proposal may have significant residual impacts on biodiversity matters, in particular the unavoidable clearance of potential superb parrot and gang-gang cockatoo habitat; visual impacts associated with introducing new transmission line infrastructure into the landscape; and traffic, fire and electric hazards associated with construction and demolition traffic, fire spread during construction, and human contact with high voltage equipment. These last risks are all extremely unlikely to occur but could have catastrophic consequences due to the potential for injury or mortality, so cannot be further mitigated.

Potentially significant impacts associated with visual amenity and safety hazards cannot be further reduced beyond what is proposed in this EIS. As the Proposal involves the construction of new transmission line infrastructure in the landscape, adverse impacts on visual amenity are unavoidable. The GJV explored options for planting vegetation along road verges to screen views of the new transmission lines, however the screening would also adversely impact rural and riverine views across the landscape. The GJV is

therefore not proposing to plant vegetation screening as it is considered more important to retain views across the landscape than to screen views of the new transmission lines.

Provided these measures and commitments, as specified in this Revised EIS, are applied and effectively implemented during all stages of the Proposal, the potential environmental impacts identified for the Proposal are considered to be acceptable and manageable.

Abbreviations

Abbreviation	Description
A	Ampere
ACT	Australian Capital Territory
AHIMS	NSW Aboriginal Heritage Information Management System
ALA	Atlas of Living Australia
ALARP	As low as reasonably practical
APZ	Asset protection zone
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
ASRIS	Australian Soil Resource Information System
BAR	Biodiversity Assessment Report (Umwelt, 2024a)
BEMOP	Bushfire Emergency Management and Operations Plan
BGW	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (listed under the Commonwealth EPBC Act) Yellow box – Blakely's Red Gum Grassy Woodland (listed under the ACT NC Act)
BGW Recovery Plan	National Recovery Plan for White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (NSW DECCW, 2011)
BOP	Bushfire Operational Plan
BPA	Bushfire Prone Area
BTEX	Benzene, toluene, ethylbenzene, xylene
Bushfire Risk Assessment	Bushfire Assessment Report for the Upper & Lower Tumut 330 kV Transmission Line Project (ABPP, 2024)
CEMP	Construction Environmental Management Plan
CHA	Cultural Heritage Assessment
CHIP	Catchment Health Indicator Program
CIE	Centre for International Economics
CNDP	Carbon Neutral Delivery Partners
CNVG	Construction Noise and Vibration Guideline (TfNSW, 2023)
CNVMP	Construction Noise and Vibration Management Plan
COG	Canberra Ornithologists Group
Conservator	ACT Conservator of Flora and Fauna
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSTM	Canberra Strategic Transport Model
DA	Development Application
DBYD	Dial Before You Dig
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DoF	Commonwealth Department of Finance
dsb	dsb Landscape Architects
EIS	Environmental Impact Statement
EMF	Electromagnetic field

Abbreviation	Description
EMF/EMI Assessment	Electric and magnetic field (EMF) assessment – Transgrid transmission lines 1, 7 relocation (CNDP, 2024)
EMI	Electromagnetic induction
EMP	Operational Environmental Management Plan
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPA	Environment Protection Authority
EP Act	ACT *Environment Protection Act 1997*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
EPBC Regulations	Commonwealth Environment Protection and Biodiversity Conservation Regulations 2000
EPP	Environment Protection Policy
EPSDD	ACT Environment, Planning and Sustainability Development Directorate
ESA	ACT Emergency Services Agency
ESCP	Erosion and Sediment Control Plan
ESD	Ecologically Sustainable Development
EWP	Elevated work platform
F&R	Fire and Rescue
FUA	Future Urban Area
Gang-gang Cockatoo Conservation Advice	Conservation Advice for *Callocephalon fimbriatum* (Gang-gang Cockatoo) (DAWE, 2022)
GCC	Ginninderry Conservation Corridor
GJV	Ginninderry Joint Venture
GSM	Golden sun moth
GSM Conservation Advice	*Synemon plana* (Golden Sun Moth) Conservation Advice (DAWE, 2021a)
ha	Hectares
Heritage Act	ACT *Heritage Act 2004*
HGL	Hydrogeological Landscape
HML	Higher mass limit [vehicle]
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IFR	Instrument Flight Rules
km	Kilometre
kN	Kilonewton
KPI	Key performance indicator
kV	Kilovolt
NGIS	National Groundwater Information System
Little Eagle Action Plan	Little Eagle Action Plan for the ACT (EPSDD, 2013)
LMWQCC	Lower Molonglo Water Quality Control Centre
LVIA	Landscape and visual impact assessment (dsb Landscape Architects, 2024)
LVIA Guideline	The NSW *Guideline for landscape character and visual impact assessment* (TfNSW, 2023)
LVIR	Landscape and visual impact rank

Abbreviation	Description
m	Metre
mG	milliGauss
MNES	Matters of National Environmental Significance
NCA	Noise Catchment Area
NC Act	ACT *Nature Conservation Act 2014*
NCP	National Capital Plan
NEM	National Electricity Market
nm	Nautical mile
NMG	Noise Management Guidelines (TCCS, 2018)
NMM	ACT Environment Protection (Noise Measurement Manual) Approval 2009 (No 1)
NO_x	Nitrogen oxides
NSW	New South Wales
NT Act	Commonwealth *Native Title Act 1993*
NTG	Natural Temperate Grassland of the South Eastern Highlands (listed under the Commonwealth EPBC Act) Natural Temperate Grassland (listed under the ACT NC Act)
NTG Conservation Advice	Approved Conservation Advice (including listing advice) for the Natural Temperate Grassland of the South Eastern Highlands (TSSC, 2016a)
NUZ2	Rural zone
NUZ3	Hills, Ridges and Buffer Areas zone
NUZ4	River Corridor zone
NVIA	Noise and Vibration Impact Assessment (Umwelt, 2024b)
OCP	Organochloride pesticides
OLS	Obstacle Limitation Surface
OPP	Organophosphorus pesticides
OSOM	Oversize overmass [vehicle]
PAD	Potential archaeological deposit
PAH	Polycyclic aromatic hydrocarbons
PALM Act	Commonwealth *Australian Capital Territory (Planning and Land Management) Act 1988*
PAN-OPS	Procedures for Air Navigation Services – Aircraft Operations
PBFD	Psittacine beak and feather disease
PCBs	Polychlorinated biphenyls
PCS	ACT Parks and Conservation Service
PCT	ACT Plant Community Type
PD Act	ACT *Planning and Development Act 2007* (superseded by the Planning Act)
PD Regulation	ACT Planning and Development Regulation 2008 (superseded by the Planning Regulation)
PFAS	Perfluoroalkyl and polyfluoroalkyl substances
Planning Act	ACT *Planning Act 2023*
Planning Regulation	ACT Planning (General) Regulation 2023
$PM_{2.5}$	Fine particulate matter
PM_{10}	Coarse particulate matter

Abbreviation	Description
PRA	Preliminary Risk Assessment
PSI	Preliminary Site Investigation (Douglas Partners, 2024)
PTWL	Pink-tailed worm-lizard (*Aprasia parapulchella*)
PTWL Conservation Advice	Conservation Advice for *Aprasia parapulchella* (Pink-tailed worm-lizard) (TSSC, 2015)
Proposal	Proposed Upper and Lower 330 kV Transmission Line Realignment
Riverview	Riverview Projects (ACT) Pty Limited
RFS	Rural Fire Service
RZ1	Suburban zone
RZ3	Urban Residential zone
SBMP	Strategic Bushfire Management Plan
SHE	Statement of Heritage Effects
Significant Impact Guidelines	Matters of National Environmental Significance: Significant Impact Guidelines 1.1 (Department of the Environment, 2013)
SLA	ACT Suburban Land Agency
SO_2	Sulfur dioxide
Superb Parrot Conservation Advice	*Polytelis swainsonii* (Superb Parrot) Conservation Advice (TSSC, 2016b)
Superb Parrot Recovery Plan	National Recovery Plan for the Superb Parrot *Polytelis swainsonii* (DAWE, 2021b)
t	Tonnes
TAP	Threat abatement plan
TCCS	ACT Transport Canberra and City Services
TEC	Threatened ecological community
TfNSW	Transport for NSW
TIA	Traffic impact assessment (Egis, 2024)
Territory Plan	ACT *Territory Plan 2008*
TMP	Traffic Management Plan
TRH	Total recoverable hydrocarbons
TTM	Temporary traffic management
Umwelt	Umwelt (Australia) Pty Limited
UF Act	ACT *Urban Forest Act 2023*
Ute	Utility vehicle
VOC	Volatile organic compound
VFR	Visual Flight Rules
Vph	Vehicles per hour
WR Act	ACT *Water Management Act 2007*

Glossary

Term	Description
Direct Impact Area	The area in which direct impacts would occur from the Proposal. Comprises the construction footprint and vegetation clearance zone.
Construction footprint	The area that would be directly impacted by the Proposal during construction. This includes: • Impact areas for new alignments, being: o Concrete footings for 18 new towers (4 footings per tower) o Concrete footings for 9 new poles (1 footing per pole) o Upgrades to existing farm tracks (widening / formalisation where required) o New access tracks where no access is currently available o Tree clearance / lopping within new easement (where trees are taller than 6 m) o Brake and winch pads for line stringing o Construction compounds and laydown areas. • Impact areas for decommissioning and removal of 27 towers and existing lines: o Excavation of 17 tower foundations (4 footings per tower to 1m below ground level). The construction footprint assessed in this EIS is 10.9 ha.
Environmental Impact Statement (EIS)	As defined under the ACT *Planning and Development Act 2007* (PD Act).
Ecologically sustainable development	A form of development that involves using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.
Line 1	Upper Tumut 330 kilovolt (kV) transmission line. Runs from Cabramurra in NSW, through Brindabella National Park in the ACT, then crosses back into NSW and the ACT near the Canberra Substation. Was previously connected into the Canberra Substation, but now diverts to the Stockdill Substation.
Line 3C	Runs from the Canberra Substation in Macnamara, along the edge of Holt, to the Stockdill Substation, then south to Williamsdale on the southern ACT border. A section of Line 3C requires additional conductors to be strung, as a network upgrade resulting from the Proposal. This section is included in discussions regarding cumulative impacts, and related utility upgrades, however would be subject to separate approvals.
Line 7	Lower Tumut 330 kV transmission line. Runs from Talbingo in NSW towards the Canberra Substation. Crosses the Murrumbidgee River upon entry into the ACT, then connects into the Canberra Substation.
New alignments	The new sections of Line 1 and Line 7 that would be installed between the ACT/NSW border and Stockdill Substation.
Lines to be removed	The existing sections of Lines 1 and 7 that would be removed, between the ACT/NSW border, Canberra Substation and Stockdill Substation.

Term	Description
Operational footprint	The area needed for operation of the Proposal. This includes the tower footings and the 60 m-wide transmission line easements of the new alignments. It also includes a vegetation clearance zone around the new alignments to the east of the Molonglo River, which is a slightly different shape to the standard transmission line easements as it accounts for the sag and swing of the conductors during hot and/or windy conditions (see **Figure 2.1**). Trees taller than 6 m would be removed from within the vegetation clearance zone to ensure they do not make contact with the conductors. Towers have been sited or made taller to avoid tree removal to the west of the Molonglo River, but the area to the east of the Molonglo River is more constrained due to other utility installations and tree removal is unable to be completely avoided in this area. The operational footprint assessed in this EIS is 61.3 ha. This includes the parts of the construction footprint that would have permanent impacts (which occur over the lifetime of the Proposal), specifically the tower footings and vehicle access tracks; and the operational easements which require ongoing tree height management.
Proponent	The organisation that has put forward the Proposal for development, in this instance, the Ginninderry Joint Venture (GJV).
Proposal	The proposed Upper and Lower Tumut 330 kV transmission line realignment project, as described in **Chapter 2.0** of this EIS.
Proposal Area	The total area in which the Proposal would be developed. It comprises the construction, demolition and operational footprints and covers an area of approximately 75.2 ha.

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1.0 Introduction

Chapter Summary
This chapter includes an introduction to the Proposal, providing its background, objectives and justifications against key policies and strategies. Details regarding the Proponent, Ginninderry Joint Venture, are also included within this chapter.

1.1 Overview

This Environmental Impact Statement (EIS) relates to the proposed Upper and Lower Tumut 330 kilovolt (kV) transmission line realignment (the Proposal), which involves the relocation of part of the Upper and Lower Tumut transmission lines near their point of connection in the Australian Capital Territory (ACT). The two transmission lines extend from Kosciuszko National Park in New South Wales (NSW), through Brindabella National Park in the ACT, before exiting and then re-entering the ACT near Uriarra Village in the ACT (see **Figure 1.1**).

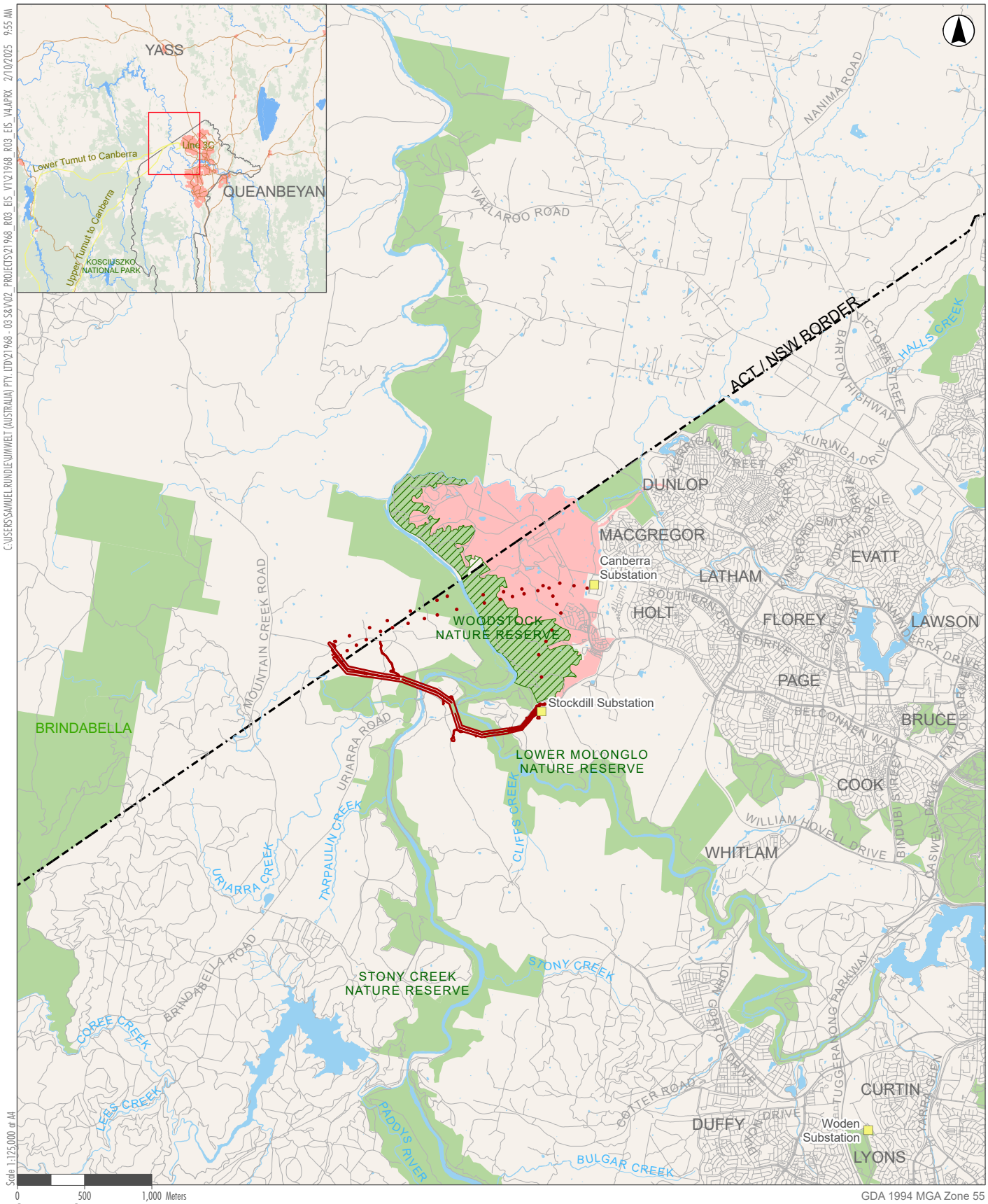
The new alignments would divert from near the ACT/NSW border and extend southeast, crossing the Molonglo and Murrumbidgee Rivers in the ACT then connecting to existing towers at the Stockdill Substation on Stockdill Drive in western Belconnen, ACT (see **Figure 1.1**). The new alignments traverse a combined distance of approximately 11.3 kilometres (km) (5.7 km for Line 1 and 5.6 km for Line 7).

The Proposal also involves the decommissioning and removal of part of the Upper and Lower Tumut transmission lines. The sections that would be removed extend northeast from NSW then across the Murrumbidgee River into the Ginninderry Conservation Corridor (see **Figure 1.1**). The Lower Tumut transmission line connects into the Canberra Substation in Macnamara, while the Upper Tumut transmission line diverts south to connect into the Stockdill Substation. The sections to be removed traverse a combined distance of approximately 12.3 km.

Refer to **Chapter 2.0** for a more detailed description of the Proposal.

This EIS has been prepared in accordance with the ACT *Planning and Development Act 2007* (PD Act) as per the transitional arrangements in Section 636 of the new ACT *Planning Act 2023* (Planning Act). The EIS has also considered matters protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Only the ACT portion of the works have been assessed in this EIS, with NSW components assessed via separate processes under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) in relation to works proposed on freehold land, and under the EPBC Act in relation to EPBC Act protected matters and works proposed on Commonwealth land. The Proposal is not covered under the West Belconnen Strategic Assessment so requires separate assessment, however is located in part, within the Strategic Assessment Area.



Legend

- Proposal Area
- ACT/NSW Border
- Road
- Nature Reserve
- Nature Reserve
- Watercourses
- Drainage Line
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development

FIGURE 1.1

Proposal Locality

Image Source: **Data source:** Geoscience Australia; Forestry Corporation of NSW (2019); DSFI (2020); NPWS Estate (2019); State Government of NSW and Deparement of Planning, Industry and Environment (2020); ACTMAPi (2022)

The Proposal is being developed by the Ginninderry Joint Venture (GJV), which is a joint venture between the Suburban Land Agency (SLA) and Riverview Developments (ACT) Pty Limited. GJV has engaged Umwelt (Australia) Pty Ltd (Umwelt) to prepare this EIS following submission of the Application for an EIS Scoping Document to the ACT Environment, Planning and Sustainable Development Directorate (EPSDD) for the Proposal. The EIS presents the findings of specialist environmental studies undertaken for the Proposal and proposes a range of avoidance and mitigation measures to address potential environmental impacts.

1.2 Objectives

The key objective of the Proposal is to move the existing 330 kV transmission lines out of the future urban area (FUA) of West Belconnen, where the Ginninderry residential development is underway, to increase the availability of housing in the area, particularly affordable housing. Removal of the lines would also improve local amenity by reducing visual impacts on residential areas, and would remove infrastructure from within the Ginninderry Conservation Corridor (GCC), which was established under the West Belconnen Strategic Assessment, and from within other nature reserves such as the Woodstock Nature Reserve. This would allow for improved conservation outcomes and visual amenity in these areas.

1.3 Justification

As per the Proposal objectives above, the justification for the Proposal includes:

- Increasing the availability of housing in western Belconnen, particularly affordable housing, by opening a substantial additional area for development within and surrounding the existing easement, and improving community connectivity and amenity through this area once constructed.
- Improving conservation outcomes within the GCC and adjacent Woodstock Nature Reserve, by removing infrastructure from within the reserves, and associated maintenance activities and access, and allowing restoration activities within the existing easements.
- Improving visual amenity through the GCC, and the Macnamara urban area.
- Ensuring the maintenance of continuous electricity supply to the region.

While the existing Line 1 and 7 are estimated to have another 25–30 years of useful life remaining, they will require replacement in the future. By relocating them now, the above outcomes may be realised, particularly the establishment of additional housing, and funding for conservation activities within the GCC, within the timeframe that Ginninderry are actively delivering their Masterplan, and implementing the West Belconnen Strategic Assessment conservation commitments within the GCC.

The Proposal is anticipated to have a net benefit equivalent to approximately $70 million in present value, based on a cost-benefit analysis undertaken by the Centre for International Economics (CIE) for the Proposal (see **Appendix G8**). This means that all the benefits of the Proposal would outweigh all the costs by around $70 million.

The Proposal would have net benefits for both the GJV and other parties, including landholders, Transgrid (as the future operator of the assets), and public land users. The GJV would have substantial costs associated with implementing the proposed realignment works and developing the resulting land parcels that become available for sale ($125 million of total costs), but this would be outweighed by the sale of the new properties and the value uplift on other properties located near the transmission lines being removed ($190 million of total benefits). This would generate a net benefit of approximately $65 million for the GJV.

Landscape amenity impacts arising from the new alignments were considered and assessed across five scenarios using different economic appraisal methodologies. Four of those scenarios resulted in a landscape amenity benefit to public land users and landholders equivalent to between $0.58 million and $3.85 million, while the fifth scenario resulted in a cost to public land users/landholders of $13.6 million. Overall, a benefit of $3.85 million was attributed to landscape amenity in the cost-benefit analysis.

The Proposal would also have a moderate positive amenity impacts through the removal of transmission lines. There would be a reduction in visual impacts due to the removal of infrastructure within the current alignment, with the most benefit to receivers within the existing and proposed urban development footprint, and key viewpoints like Shepherds Lookout on Stockdill Drive. Additionally, while the noise impacts from existing transmission lines are minor, this source would be removed from the current and future urban area with the removal of the infrastructure.

Further, the maintenance costs and impacts from maintenance activities for Transgrid would be reduced as the new alignments are shorter than the existing alignments (11.3 km versus 12.3 km), and would have a longer useful life, thereby resulting in a benefit of $70,000 for Transgrid. The Proposal would therefore result in a net benefit of approximately $5.1 million for parties other than the GJV.

Refer to **Section 3.3.4** and **Chapter 14.0** for more detail on the cost-benefit analysis.

1.4 Proponent

The GJV is a joint venture between the SLA and Riverview Developments (ACT) Pty Limited. The SLA is a statutory authority within the EPSDD that is responsible for urban development in the ACT on behalf of the ACT Government. SLA developments aim to balance social, economic and environmental benefits for all Canberrans through the following (SLA, 2023):

- Affordable living.
- A safe and healthy population.
- Social inclusion and diversity.
- Housing choices.
- Environmental sustainability.

Riverview Group is a subsidiary of Corkhill Bros Pty Ltd. It is a property development company that aims to create “communities of modern commerce and living that are at the forefront of international design and sustainability” (Riverview Group, 2020). Riverview Projects (ACT) Pty Limited (Riverview) acts as the development/project manager for the GJV.

Transgrid would be the owner and operator of the assets once they are operational. Transgrid operates and manages the high voltage electricity transmission network in NSW and the ACT, which forms part of the backbone of the National Electricity Market (NEM) that enables energy trading between Australia’s eastern states. Transgrid is not developing the Proposal and is not the Proponent for the purposes of this EIS, but is heavily involved in design development as it will ultimately be responsible for operating the assets.

Table 1.1 Proponent Details

Details	Proponent
Organisation Name	Riverview Projects (ACT) Pty Limited on behalf of the Ginninderry Joint Venture
Postal Address	1 McClymont Way, Strathnairn ACT 2615
ABN	30 165 870 539
Contact Person	Matthew Frawley

1.5 Scoping Document

A Scoping Document outlines the format and matters to be addressed in an EIS for understanding the potential environmental impacts of a development. Umwelt submitted an application under Section 212(1) of the PD Act for an EIS Scoping Document on 12 May 2023. A Scoping Document (attached at **Appendix A**) was subsequently issued by the EPSDD under Division 8.2.2 of the PD Act on 13 July 2023.

It should be noted that some of the entity comments initially provided in the Scoping Document have been revised in consultation with those entities. The revisions to the original requirements are detailed in **Appendix B**.

Appendix C provides a summary of the requirements from the Scoping Document (as modified) and cross-references to the relevant sections of the EIS where these requirements have been addressed.

2.0 Proposal Description

Chapter Summary
This chapter provides a detailed description of the Proposal. It describes the land uses and environmental setting of the Proposal Area and surrounding landscape, the current design of the Proposal and the key components, and the alternatives considered for the Proposal Area and Proposal layout, including no Proposal.

2.1 Proposal Overview

GJV is proposing to realign part of the Upper and Lower Tumut 330 kV transmission lines in proximity to the Canberra and Stockdill Substations. The works would be located in western Belconnen in the ACT and further west on rural blocks.

The Proposal involves two main components:

- Installation of two new 330 kV lines that would connect the existing Upper and Lower Tumut transmission lines (Lines 1 and 7, respectively) to the Transgrid transmission network in the ACT.
- Decommissioning and removal of part of existing Lines 1 and 7.

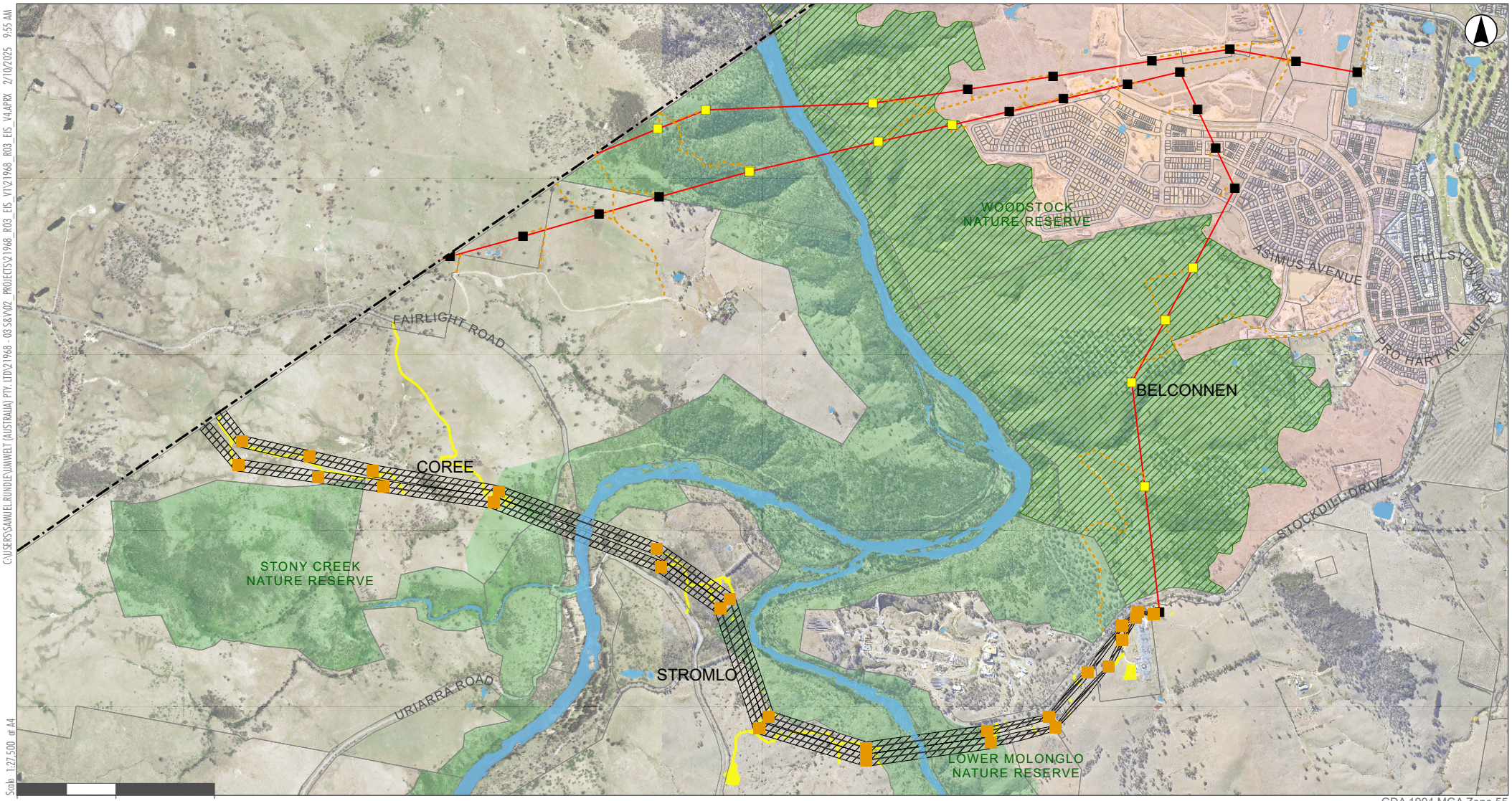
Detail about each of the above components of work is provided in **Section 2.3**.

For the purposes of this EIS, specific terminology has been used to describe the Proposal site. This terminology is described in **Table 2.1** and shown in **Figure 2.1**.

Table 2.1 Terminology Used to Describe the Proposal Site

Term	Description
Proposal Area	The total area in which the Proposal would be developed. It comprises the construction, demolition and operational footprints and covers a total area of approximately 75.2 hectares (ha).
New alignments	The new sections of Lines 1 and 7 that would be installed between the ACT/NSW border and Stockdill Substation.
Lines to be removed	The existing sections of Lines 1 and 7 that would be removed, between the ACT/NSW border, Canberra Substation and Stockdill Substation.
Construction footprint	The area that would be directly impacted by the Proposal during construction. This includes the impact areas of the new alignments associated with tower footings, new access tracks, trees that would need to be cleared/lopped due to their proximity to the lines, construction compounds, and laydown areas. It also includes the impact areas for demolition of the towers along the existing Lines 1 and 7, where footings will be removed. Demolition works would utilise existing access tracks that have not been included in the footprint. The construction footprint assessed in this EIS is 10.9 ha.

Term	Description
Operational footprint	The area needed for operation of the Proposal. This includes the tower footings and the 60 metre (m)-wide transmission line easements of the new alignments. It also includes a vegetation clearance zone around the new alignments to the east of the Molonglo River, which is a slightly different shape to the standard transmission line easements as it accounts for the sag and swing of the conductors during hot and/or windy conditions (see **Figure 2.1**). Trees taller than 6 m would be removed from within the vegetation clearance zone to ensure they do not make contact with the conductors. Towers have been sited or made taller to avoid tree removal to the west of the Molonglo River, but the area to the east of the Molonglo River is more constrained due to other utility installations and tree removal is unable to be completely avoided in this area. The operational footprint assessed in this EIS is 61.3 ha. This includes the parts of the construction footprint that would have permanent impacts (which occur over the lifetime of the Proposal), specifically the tower footings and vehicle access tracks; and the operational easements which require ongoing tree height management.



Legend

- New Towers
- Tower Foundations to be Removed
- Tower Foundations to be Left In Situ
- New Transmission Lines
- Construction Footprint
- Operational Footprint
- Access Tracks - Existing
- Demolition Footprint
- Property Boundaries
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- ACT/NSW Border
- Watercourses
- Nature Reserves

FIGURE 2.1

Construction and Operational Footprints of the Proposal

Image Source: Nearmap (2022) Data source: ACT Government (2021)

2.2 Site Description

2.2.1 Location

The Proposal Area is located within the districts of Coree, Stromlo and Belconnen in the ACT, more than 13 km west of the Canberra city centre (see **Figure 1.1**). From the ACT/NSW border, the new alignments would extend southeast through farmland across the Murrumbidgee and Molonglo River corridors to the Stockdill Substation on Stockdill Drive (see **Figure 2.1**). The sections of the transmission lines to be removed extend northeast from the ACT/NSW border, across farmland and the Murrumbidgee River corridor, then across the GCC and FUA to the Canberra Substation in Macnamara. Line 7 connects into the Canberra Substation, and Line 1 diverts south through the GCC to connect into the Stockdill Substation (**Figure 2.1**).

The Proposal is located across 33 different ACT land parcels, of which 17 would have the new alignments, and 19 have the existing lines that would be removed. Some blocks are used for multiple components of the Proposal (see **Table 2.2**). These blocks cover a total area of 2,359 ha, of which 75.2 ha has been assessed in this EIS for development of the Proposal (the Proposal Area).

The Australian and ACT Governments share responsibility for development of land in the ACT. National Land is used by or on behalf of the Commonwealth, while Territory Land is managed by the ACT Government on behalf of the Commonwealth. All ACT land in the Proposal Area is on Territory Land.

The land tenure (or titling) system in the ACT is managed through Crown leases, issued either by the Commonwealth Department of Finance (DoF) or the EPSDD. The ACT land parcels in the Proposal Area have varying custodianship, including private leases and open space. The landholders for each land parcel are provided in **Table 2.2**.

Note that this list of land parcels differs slightly from the Scoping Document Application due to number of factors, primarily the retirement of a number of large rural blocks in Macnamara and Strathnairn. The relevant locations of the Proposal in these areas has been updated with new urban blocks in **Table 2.2**.

Table 2.2 ACT Land Parcels in the Proposal Area

Block / Section Number	District	Block Lifecycle Stage	Land Use Zone	Landholder	Proposed Work
10	Coree	Registered Rural	NUZ2 Rural; NUZ4 River Corridor	Parks and Conservation Service (PCS)	Lines to be removed – Lines 1 and 7
33	Coree	Approved Rural	NUZ4 River Corridor	PCS	New alignments – Lines 1 and 7
43	Coree	Registered	NUZ2 RURAL	Bidgeeyarra Pty Limited	New alignments – Lines 1 and 7
47	Coree	Registered Rural	NUZ2 Rural	Robyn Leigh Shorrock and Neil Shorrock	Lines to be removed – Lines 1 and 7
63	Coree	Approved Rural	NUZ2 Rural; NUZ4 River Corridor	PCS	Lines to be removed – Lines 1 and 7
64	Coree	Approved Rural	NUZ4 River Corridor	PCS	New alignments – Lines 1 and 7
72	Coree	Registered Rural	NUZ2 Rural; NUZ4 River Corridor	Bidgeeyarra Pty Limited	Lines to be removed – Lines 1 and 7
85	Coree	Proposed Rural	NUZ4 River Corridor	PCS	New alignments – Lines 1 and 7 Lines to be removed – Lines 1 and 7
87	Coree	Approved Rural	NUZ4 River Corridor; NUZ2 Rural	PCS	New alignments – Line 1
88	Coree	Registered Rural	NUZ4 River Corridor; NUZ2 Rural	Bidgeeyarra Pty Limited	New alignments – Lines 1 and 7
452	Stromlo	Approved Rural	NUZ4 River Corridor	PCS	New alignments – Lines 1 and 7
480	Stromlo	Proposed Rural	NUZ4 River Corridor	PCS	New alignments – Lines 1 and 7
481	Stromlo	Proposed Rural	NUZ4 River Corridor	PCS	New alignments – Lines 1 and 7
487	Stromlo	Registered Rural	NUZ4 River Corridor; NUZ2 Rural	SLA	New alignments – Lines 1 and 7
488	Stromlo	Proposed Rural	NUZ4 River Corridor	PCS	New alignments – Lines 1 and 7
1461	Belconnen	Registered Rural	NUZ3 Hills, Ridges and Buffer Areas	Transport Canberra and City Services (TCCS)	New alignments – Lines 1 and 7
1462	Belconnen	Registered Rural	NUZ3 Hills, Ridges and Buffer Areas	PCS	Lines to be removed – Line 1
1559	Belconnen	Registered Rural	NUZ1 Broadacre	Transgrid	Lines to be removed – Line 7
1578	Belconnen	Proposed Rural	NUZ4 River Corridor	PCS	New alignments – Lines 1 and 7
1586	Belconnen	Registered Urban	NUZ3 Hills, Ridges and Buffer Areas	TCCS No Waste	Lines to be removed – Line 7

Block / Section Number	District	Block Lifecycle Stage	Land Use Zone	Landholder	Proposed Work
1602	Belconnen	Registered Rural	NUZ4 River Corridor	Graeme John Trevaskis and Glenis Margaret Trevaskis	New alignments – Lines 1 and 7
1614	Belconnen	Approved Rural	NUZ4 River Corridor	PCS	New alignments – Lines 1 and 7
1634	Belconnen	Registered Rural	NUZ4 River Corridor; NUZ3 Hills, Ridges and Buffer Areas	Graeme John Trevaskis and Glenis Margaret Trevaskis	New alignments – Lines 1 and 7 Lines to be removed – Line 1
1635	Belconnen	Registered Rural	NUZ3 Hills, Ridges and Buffer Areas	Transgrid	New alignments – Line 1 and 7 Lines to be removed – Line 1
Block 1 Section 20	Macnamara	Approved Urban	PRZ1 Urban Open Space; RZ3 Urban Residential; RZ1 Suburban	SLA	Lines to be removed – Line 1
Block 9 Section 3 [1]	Macnamara	Approved Urban	NUZ4 River Corridor; PRZ1 Urban Open Space; CF Community Facilities; TSZ1 Transport; NUZ3 Hills, Ridges and Buffer Areas; RZ3 Urban Residential; CZ5 Mixed Use; RZ1 Suburban	SLA	Lines to be removed – Lines 1 and 7
Block 13 Section 21 [1]	Macnamara	Approved Urban	CF Community Facilities; RZ3 Urban Residential	SLA	Lines to be removed – Line 1
Block 14 Section 21 [1]	Macnamara	Approved Urban	PRZ1 Urban Open Space; RZ3 Urban Residential	SLA	Lines to be removed – Line 1
Block 18 Section 25 [1]	Macnamara	Approved Urban	CF Community Facilities; RZ3 Urban Residential	SLA	Lines to be removed – Line 1
Block 6 Section 3	Macnamara	Approved Urban	NUZ4 River Corridor	PCS	Lines to be removed – Lines 1 and 7
Block 7 Section 3	Macnamara	Approved Urban	NUZ4 River Corridor	PCS	Lines to be removed – Lines 1 and 7
Block 2 Section 85	Strathnairn	Approved Urban	RZ3 Urban Residential; CZ5 Mixed Use	SLA	Lines to be removed – Line 7
Block 3 Section 85	Strathnairn	Approved Urban	CF Community Facilities; NUZ1 Broadacre; CZ1 Core Zone; CZ5 Mixed Use	SLA	Lines to be removed – Line 7

[1] Note recent subdivision – new Macnamara block replace retired Block 1, Section 21 and Block 5, Section 3.

The Proposal Area is mostly situated on rural blocks that are typically used for grazing, with some open spaces and nature reserves along the Murrumbidgee and Molonglo River corridors. As shown in **Figure 2.2**, this land mostly corresponds with land use zones NUZ2 Rural; NUZ3 Hills, Ridges and Buffer Areas; and NUZ4 River Corridor, with some areas also subject to the Pc: Nature Reserve overlay. The eastern ends of the lines to be removed are located on residential land associated with the West Belconnen FUA (RZ1 Suburban, RZ3 Urban Residential and others), as well the GCC (NUZ3).

The eastern ends of the new alignments are located on farming land that is zoned NUZ3. This area is becoming a hub of utility infrastructure, informally referred to as the 'Stockdill Drive Infrastructure Precinct'. As shown in **Figure 2.2**, a range of utilities are existing or proposed in this area, including:

- existing Icon Water Lower Molonglo Water Quality Control Centre (LMWQCC)
- existing Transgrid Stockdill Substation
- proposed ACT Government temporary green waste facility[2]
- proposed Neoen Territory Battery project[3].

The objectives of each relevant land use zone and overlay are discussed in **Section 2.2.3**.

2.2.2 Environmental Setting

The Proposal Area and surrounding landscape have a history of agricultural land use, primarily livestock grazing. As a result, the landscape has been subject to extensive land clearing and some environmental degradation. No existing contamination has been found in the Proposal Area, although there is potential for fill and pesticides to be present consistent with a history of rural land use. PFAS (perfluoroalkyl and polyfluoroalkyl substances) may also be present on Block 1614 Belconnen, due to legacy fire-fighting practices in the area and PFAS in wastewater at the LMWQCC (see **Chapter 5.8**). Remnant patches of native vegetation and paddock trees provide habitat and support flora, fauna and landscape functions.

The Proposal Area sits within the low hills and plains landscape of the ACT, which is generally dominated by woodland and secondary grassland ecological communities. Low and moderate-high quality box gum woodlands and derived native grasslands are present throughout the Proposal Area, with a very small patch of natural temperate grassland also located in the Proposal Area. The higher quality native vegetation is located in the eastern and western ends of the new alignments, with exotic grasslands located elsewhere throughout the Proposal Area.

The Proposal Area spans two riparian corridors (the Murrumbidgee and Molonglo Rivers) as well as several smaller water features. The eastern sections of the new alignments are within the lower Molonglo catchment, while the western sections of the new alignments and the lines to be removed are located outside of the Molonglo catchment, within the upper Murrumbidgee catchment. These river corridors provide important habitat for many species in the ACT region, including threatened species.

Several public reserves are located within or near the Proposal Area, including the Woodstock Nature Reserve, GCC, Molonglo River Corridor and Kama Nature Reserve (see **Figure 1.1**). These reserves are important natural systems in the ACT as they contain significant ecological values and contribute to landscape connectivity throughout the region.

[2] https://www.planning.act.gov.au/development-applications-assessments/development-applications/da-details?da-number=202240118&amendment-version=

[3] https://www.planning.act.gov.au/development-applications-assessments/assessment-of-development/environmental-impact-assessment/environmental-impact-statements/territory-battery-energy-storage-belconnen

2.2.3 Land Use

The Proposal Area is a mixture of privately leased rural land and public land. The privately leased land is mostly undeveloped and managed with sheep grazing, except for the eastern part of the Proposal Area which is being developed for residential purposes and utility infrastructure. The public land is managed as nature reserve or other conservation areas (e.g. the GCC). All existing land uses would continue unchanged following construction of the Proposal, with minor disruptions associated with construction (e.g. exclusion of stock from construction areas).

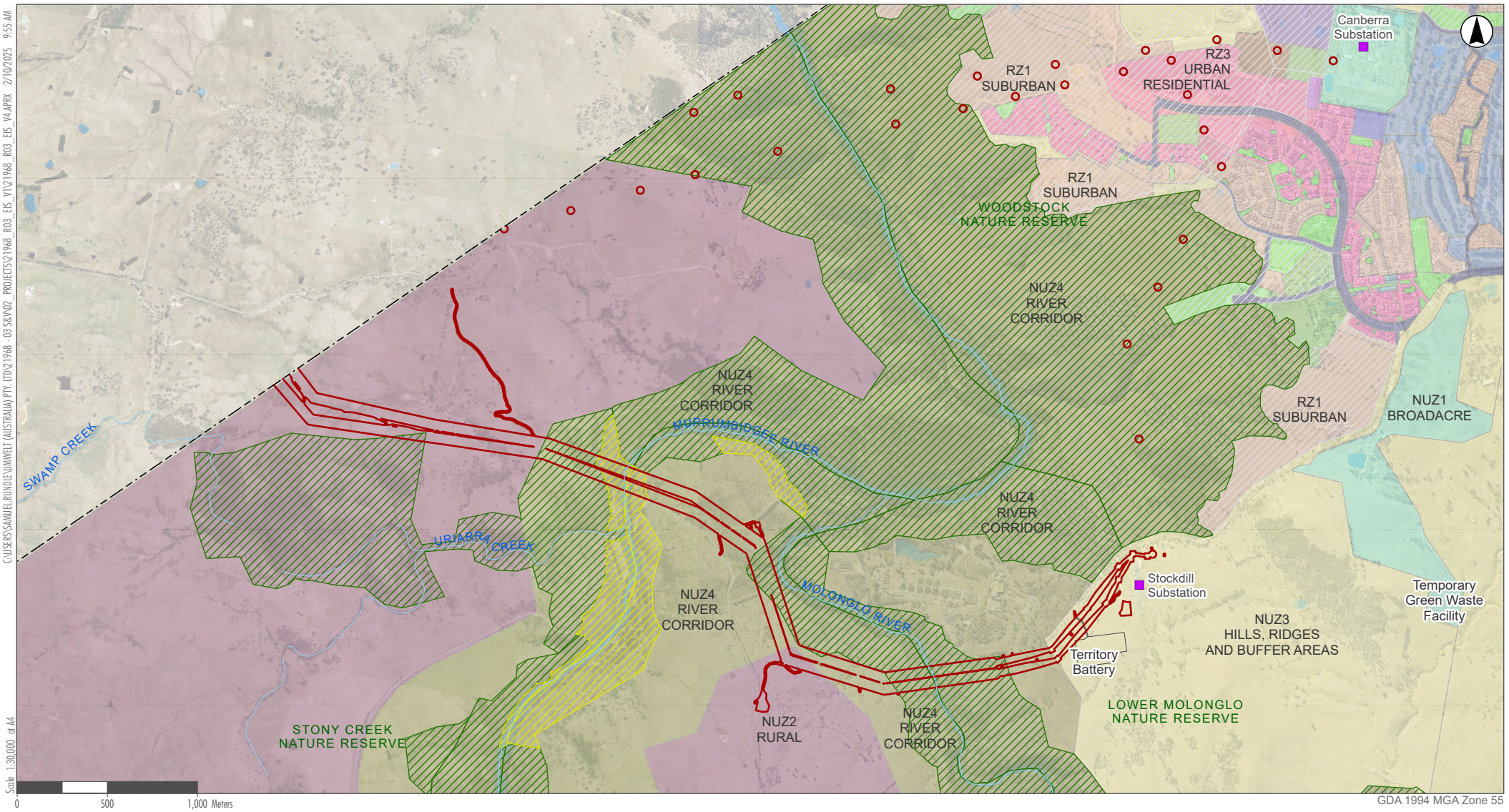
The new alignments are located across non-urban land use zones (NUZ2, NUZ3 and NUZ4; see **Table 2.2**). The objectives of these zones are primarily to conserve the non-urban values of the land, notably the rural landscape of NUZ2, the hill system of NUZ3, and the river corridors in NUZ4, and to ensure land development is compatible with these values. Under the *Territory Plan 2008* (the Territory Plan), the Proposal is categorised as a 'Major Service Conduit' (comprising transmission lines with a voltage greater than 66 kV), and is permissible with development approval in all three land use zones. Refer to **Section 3.1.1.1** for more information on the ACT planning framework.

Removal of the existing lines does not represent changes to existing approved land uses and is permissible in the relevant non-urban and urban land use zones impacted by these works. The network upgrade resulting from the Proposal, being the stringing of 3 additional conductors along Line 3C (between the Stockdill and Canberra Substations) is also permissible in the relevant non-urban and urban land use zones impacted by these works. While discussed in numerous places within this EIS, this component of work would be subject to separate approvals (refer **Section 15.5**).

As shown in **Figure 2.2**, parts of the Proposal Area are also subject to the Pc: Nature Reserve overlay and FUA: Future Urban Area overlay. Land subject to a nature reserve overlay is managed by PCS to protect and conserve high conservation value flora, fauna, and habitat. Nature reserves are also used for scientific research, education and nature-based recreation.

Woodstock Nature Reserve and the Molonglo River Corridor are both located within the Proposal Area. The Molonglo River Corridor is managed in accordance with the *Molonglo River Reserve Management Plan 2019*, which lays out the policies and actions for conserving and enhancing the environment along the Molonglo River (ACT Government, 2019). The parts of the Proposal Area located within the Molonglo River Corridor are subject to this management plan.

The FUA overlay identifies land that has been set aside for urban development and which has certain development requirements under the PD Act / new Planning Act, including the need for development to be consistent with the principles and policies laid out in the FUA's structure plan. Part of the lines to be removed in the Proposal are located within the West Belconnen FUA, so are subject to the *Structure Plan for West Belconnen: Land located West of Macgregor and Holt in the District of Belconnen*. The Ginninderry residential area, which is located within the West Belconnen FUA, is being developed by the GJV.



Legend

- Proposal Area
- ACT/NSW Border
- Existing Substation
- Road
- Drainage Line
- Waterbodies

Territory Plan Land Use Zones

- CF - COMMUNITY FACILITIES
- CZ1 - CORE ZONE
- CZ5,MIXED USE
- NUZ1,BROADACRE
- NUZ2,RURAL
- NUZ3,HILLS, RIDGES AND BUFFER AREAS
- NUZ4,RIVER CORRIDOR
- PRZ1,URBAN OPEN SPACE
- PRZ2,RESTRICTED ACCESS RECREATION ZONE
- RZ1,SUBURBAN
- RZ3,URBAN RESIDENTIAL
- RZ4,MEDIUM DENSITY RESIDENTIAL
- RZ5,HIGH DENSITY RESIDENTIAL
- TSZ1,TRANSPORT
- TSZ2,SERVICES

Territory Plan Overlay Zones

- FUA – Future Urban Area
- Pc – Nature Reserve
- Pd – Special Purpose Reserve

FIGURE 2.2

Land Use Zoning

Image Source: Nearmap (2022) **Data source:** ACT Government (2023)

2.3 The Proposal

The Proposal involves the realignment of part of the Upper and Lower Tumut 330 kV transmission lines. It comprises the following activities within the ACT:

- Civil works associated with construction of new temporary access tracks, involving vegetation removal and modification, levelling, and laying of sub-base and/or metal grids for access across wet areas, as required. Existing tracks through farmland have been used where possible, to minimise impacts associated with line construction and removal works. Existing tracks for construction of the new alignments have been included in the defined Proposal Area.
- Installation of temporary facilities associated with construction, including material laydown areas, construction compounds, carparking, and site office(s), all located within the laydown areas.
- Civil works to prepare for construction of the new tower foundations, involving vegetation removal and modification where required, earthworks to level the site if required, and foundation preparation (excavation and/or boring, steel fabrication works and concrete pours).
- Installation of new towers or poles and overhead transmission lines associated with the realignment of part of the existing Upper and Lower Tumut transmission lines (Lines 1 and 7, respectively), including nine new towers and four poles for Line 1 and nine new towers and five poles for Line 7.
    - Construction of foundations for towers and poles. Towers would require four foundations (one for each foot), approximately 2.5 m wide, and 3 m to 10 m deep, depending on ground conditions. Poles would require one foundation each.
    - The towers would range in height from approximately 34 m to 40 m above ground level, and the poles would be between 40 m and 56 m tall.
    - Poles have a smaller impact footprint than towers and are proposed to be used on approach to the Stockdill Substation to minimise ecological impacts. Poles limit the swing and sag of the overhead cables, which minimises the extent of any tree lopping required. Poles are slightly more costly and more complex to install than towers as they require deeper footings and geotechnical investigations, so have only been used where ecological impacts could be minimised by doing so (i.e. in proximity to woodland along Stockdill Drive). **Plate 2.1** shows an example tower and pole which are illustrative of the towers and poles that would be installed as part of the Proposal.

Tower

Pole

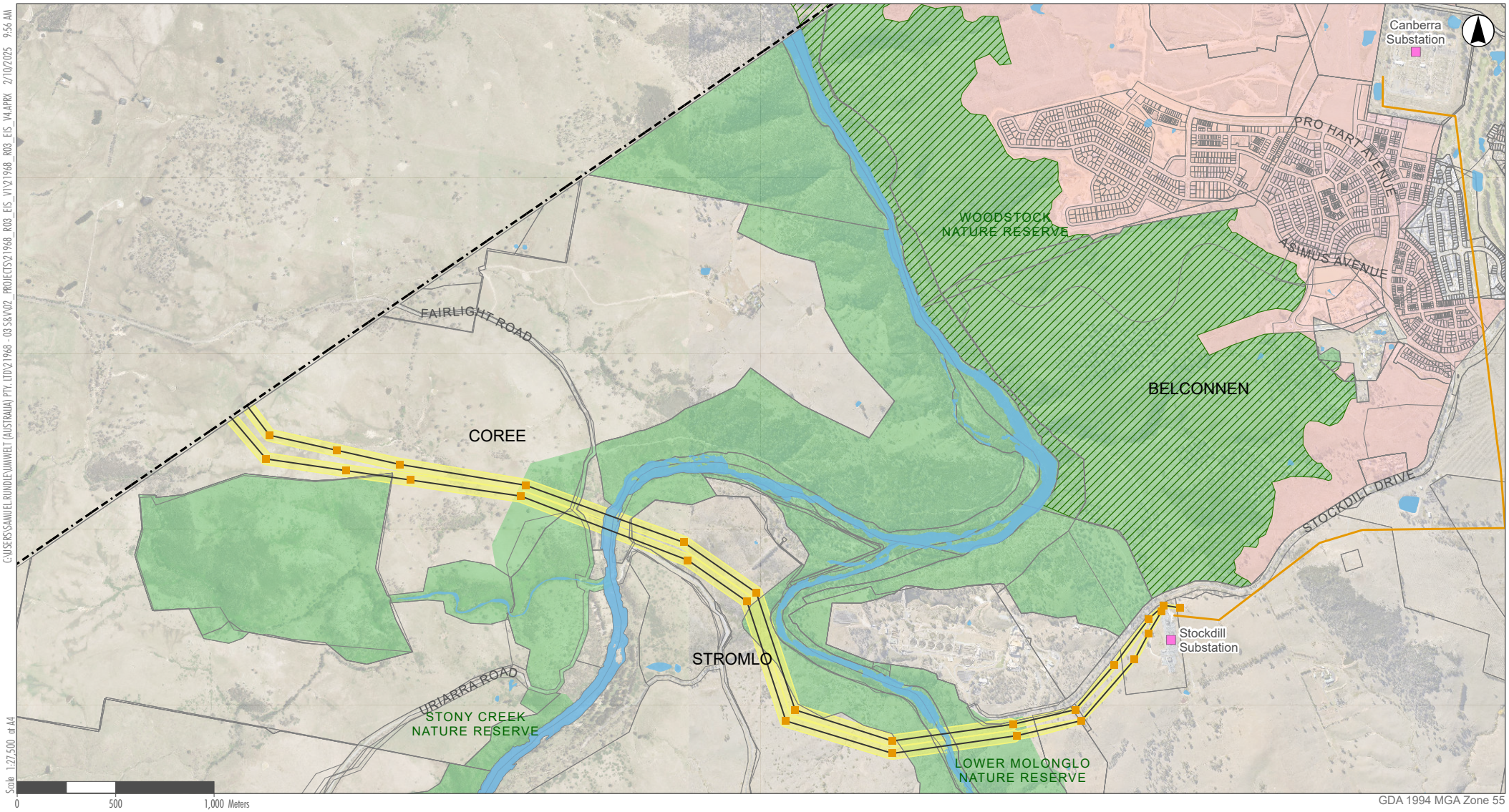
Plate 2.1 Example Tower and Pole That Would be Installed as Part of the Proposal

- Electrical works to connect the new Line 1 to the Stockdill Substation (replacing the existing Line 1 connection, thereby resulting in no change to the electrical configuration of the substation).
- Decommissioning and removal of part of the existing Lines 1 and 7, including:
  - Destringing of lines using brake and winch equipment.
  - Cutting tower off at the base using one excavator, with the other excavator holding onto the tower and lowering it to the ground in one piece.
  - Cutting lowered tower into segments and loading onto the truck and dog for transport off site.
  - In rural areas, and the Ginninderry future urban area, concrete foundations will be excavated.
  - In agreement with the ACT Government Reserve Manager the concrete foundations within Nature Reserves will be left in situ to minimise ground disturbance.
  - In total, removal of 18 towers from Line 1, involving complete removal of 11 tower foundations with the remaining foundations to be left in situ.
  - Removal of nine towers from Line 7, involving complete removal of six tower foundations with the remaining foundations to be left in situ.
  - Existing tracks within current operational easements to be used for the removal of the lines.
- Following completion of the construction works, the temporary construction areas (laydown areas etc.) would be rehabilitated.

The proposed construction and demolition methodologies are detailed further in **Section 2.3.1** and **Section 2.3.3**, respectively.

Detailed electrical and civil designs have been prepared for the Proposal. **Figure 2.3** shows the Proposal layout once operational, including locations of the new alignments and the lines to be removed, while **Figure 2.4** shows the construction layout, including the location of temporary access tracks and construction areas.

These designs, and the Proposal Area, have been iteratively developed over several years, primarily to reduce potential ecological, cultural and visual impacts. The construction and operational footprints assessed in this EIS are conservative to ensure that the maximum extent of potential impacts has been investigated but reflect the substantial efforts by the GJV and Transgrid to reduce potential environmental impacts. The Proposal's development history is detailed in **Section 2.4**, including the various alternatives considered.



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Scale: 1:27,500 at A4

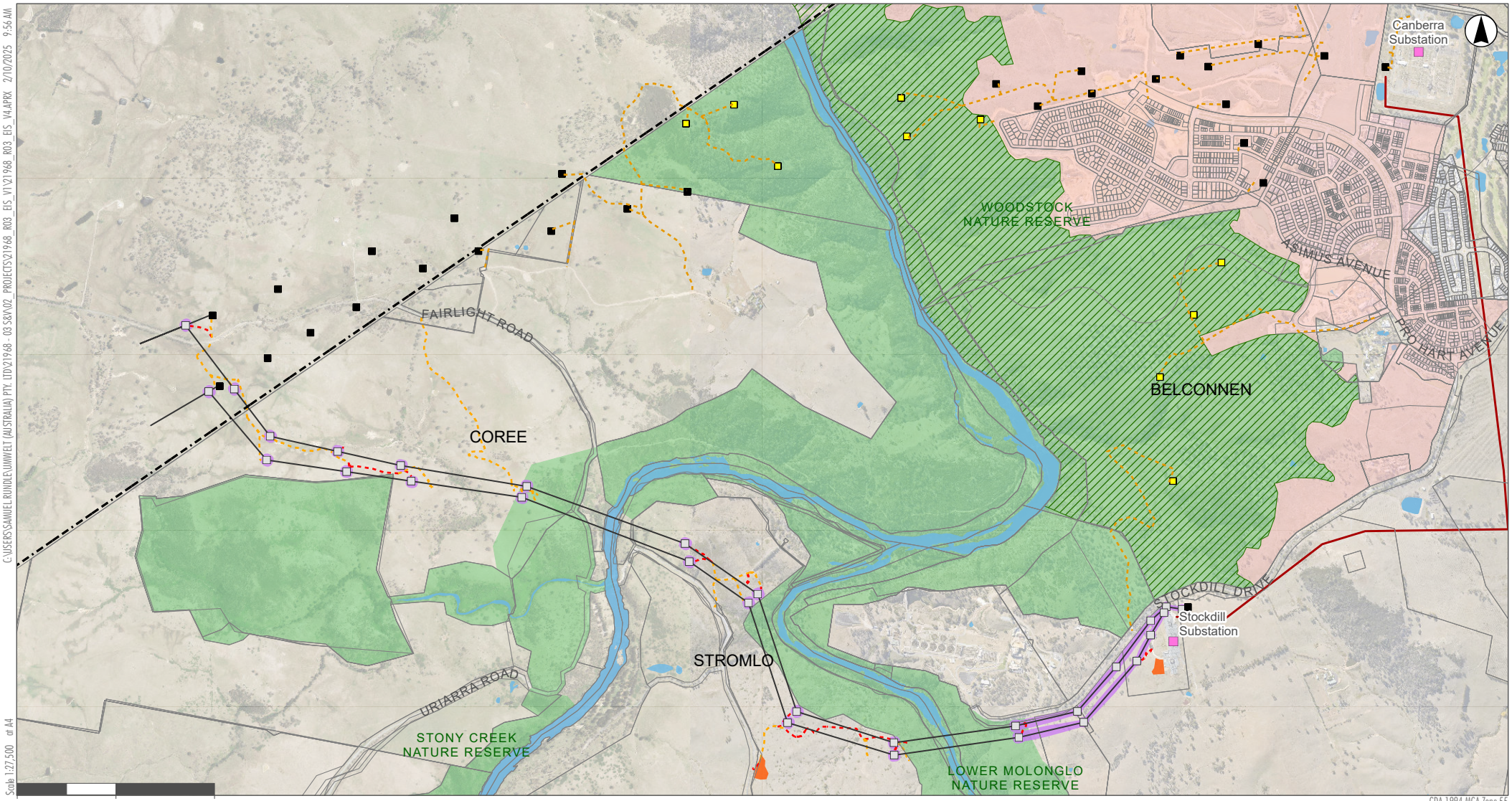
Legend

- New Towers
- Line 3C Alignment – subject to separate approvals
- New Transmission Lines
- Transmission Line Easement
- Existing Substation
- Property Boundaries
- ACT/NSW Border
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development

FIGURE 2.3

Operational Footprint

Image Source: Nearmap (2022) Data source: ACT Government (2021)



Legend

- New Towers
- Tower Foundations to be Removed
- Tower Foundations to be Left In Situ
- New Transmission Lines

Construction Components

- Line 3C Alignment - subject to separate approvals
- Brake and Winch Pull Zones
- Construction Laydown Areas
- Vegetation Clearance Zone

- Access Tracks - Existing
- Access Tracks - New
- Existing Substation
- Property Boundaries
- ACT/NSW Border
- Watercourses

- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development

FIGURE 2.4

Construction Footprint

Image Source: Nearmap (2022) Data source: ACT Government (2021)

2.3.1 Procurement and Civil Works

Procurement of new materials (e.g. towers and poles, conductors, fittings and insulators) is planned to commence in August 2026 and run through to January 2027 (**Table 2.3**). Once purchased, materials would be transported to site and stored at one of three construction laydown areas depending on where they would be installed along the new alignments. For example, the construction laydown area located adjacent to the Stockdill Substation (see **Figure 2.4**), would be used during construction of the new alignments east of the Molonglo River.

Table 2.3 Indicative Procurement Schedule

Procurement Activity	Aug '26				Sep'26				Oct'26				Nov'26				Dec'26				Jan'27			
Conductors																								
Fittings																								
Insulators																								
Steel for towers																								
Poles																								

Mobilisation to site would occur in August 2026, with civil works commencing thereafter (**Table 2.4**). Access tracks would be constructed over a period of around three months, ending in November 2026, while civil works for tower and pole footings would occur over a longer period in sections across the new alignments.

Table 2.4 Indicative Site Preparation Schedule

Site Preparation Activity	Aug '26				Sep'26				Oct '26				Nov'26				Dec'26				Jan'26				Feb '26				Mar'26			
Mobilisation																																
Civil works for access tracks																																
Civil works for footings																																

Mobilisation would involve the establishment of construction laydown areas, including site sheds/compounds, and finalisation of safety plans and construction staff inductions and training. Most of the construction vehicles would be moved to site during this time, as per the vehicle mobilisation schedule in **Table 2.5**. Examples of each of these vehicles are shown in **Plate 2.2.**

Table 2.5 Indicative Mobilisation Vehicle Movement Plan

	Month	Aug '26			
Vehicle Type	**Quantity**	**Wk of 3rd**	**Wk of 10th**	**Wk of 17th**	**Wk of 24th**
4WD ute	4				
Franna crane	1				
Posi-track loader	2				
5 tonne (t) excavator	1				
Truck and dog	1				
Grader	1				

4WD ute (FleetCrew, 2023)

Franna crane (West Cranes & Access Hire, 2023)

Posi-track loader (Equipment Journal, 2022)

Excavator (Earthmoving Equipment Magazine, 2021)

Truck and dog (Hawe Earthmoving, 2023)

Grader (Komatsu, 2023)

Plate 2.2 Example Construction Vehicles for Civil Works

Civil works would involve the following activities:

- Establishment of erosion and sediment controls as required (see **Chapter 6.55.8** for more information).
- Vegetation clearance as required, e.g. removal or lopping of select trees within the construction footprint.
- Removal of topsoil. Topsoil able to be reused on site would be temporarily stored adjacent to the excavation areas or at the laydown areas, depending on the length of time until it can be reused. Topsoil unable to be reused by the Proposal would be reused at other construction sites where possible (e.g. at the Ginninderry residential development), or disposed of off-site at an appropriate waste facility. Refer to **Chapter 6.0** for more information about sediment and erosion control, and **Chapter 13.0** for more information about waste management.

- Ground levelling as required for the laydown areas, tower/pole footings and other construction areas (e.g. brake and winch locations; see **Section 2.3.2.1.**
- Construction of the access tracks and upgrades to existing tracks as required.
- Construction of the warehouse and temporary demountable office at the Canberra Substation laydown area, with gravel to be placed beneath the sheds.
- Installation of temporary fencing around the construction footprint and around trees and habitat to be retained. Refer to **Chapter 5.0** for more information about the protection of ecological values.

The vehicles required for civil works would be a mix of standard light and heavy construction vehicles, including utes, posi-tracks, excavators, a truck and dog, and a grader. As indicated in **Table 2.6**, all vehicles would be needed at each construction site at any one time, and works would generally proceed from one end of the new alignments to the other. At the end of each day, the utes would be returned to the nearest construction laydown area for overnight storage, while the construction machinery and any unused materials required for construction (e.g. fill for tracks) would be left at the construction location ready for the next workday.

Table 2.6 Indicative Site Preparation Vehicle Movement Plan

	Month	Sep '26					Oct'26				Nov '26			
Vehicle Type	**Quantity**	1st	8th	15th	22nd	29th	6th	13th	20th	27th	3rd	10th	17th	24th
4WD ute	4													
Posi-track loader	2													
5 t excavator	2													
Truck and dog	1													
Grader	1													

Mobilisation and site preparation works would be undertaken during standard construction hours, although ad hoc out-of-hours works may be required at times (e.g. due to poor weather or to avoid disturbance to a particular landholding or event). Standard construction hours would be as follows:

- Monday to Friday: 7 am to 6 pm.
- Saturday: 7 am to 1 pm.

2.3.2 Construction of New Alignments

Construction of the new alignments is planned to commence in October 2026. Works would commence with the stringing of additional conductors along Line 3C (subject to separate approvals), followed by the construction and connection of the new alignments (Lines 1 and 7). Construction works would finish around January 2027 (**Table 2.7**). The works involved in each stage of construction are detailed below.

Table 2.7 Indicative Construction Schedule

Construction Activity	Oct '26	Nov '26	Dec '26	Jan '27	Feb '27	Mar '27	Apr '27	May '27	Jun '27	Jul '27	Aug '27	Sep '27	Oct '27	Nov '27	Dec '27	Jan '27	Feb '27
Line 3C stringing (subject to separate approvals)																	
Tower/pole assembly and erection																	
Lines 1 and 7 stringing																	
Lines 1 and 7 connection works																	

2.3.2.1 Construction of Tower/Pole Foundations

The tower/pole foundations would be constructed according to standard Transgrid practice, with drill rigs and excavators equipped with augers suitable for cutting and coring soil and rock during excavation. Geotechnical investigations will be undertaken prior to construction to confirm the type of soil and/or rock present at each footing location, and therefore the type of equipment needed for excavation. Where hard rock is located, coring barrels or air track drills may be required.

A 45 t drill rig and 20 t and 3 t excavators are anticipated to be required to construct the tower footings. A concrete agitator truck, trailer and six 4WD utes would also be required. **Plate 2.3** shows examples of each of these machines.

Each footing excavation would be filled with concrete and reinforced with steel rods to form a solid foundation that supports the towers/poles and cable tension. The foundations would be circular and are anticipated to be between 3 m and 10 m deep (depending on soil and rock characteristics at each footing location and tower/pole height). The tower foundations would be located around each of the four tower feet and have a diameter of approximately 2.5 m each. A single foundation is required for each pole. These foundations would have a diameter of approximately 2 m.

Drill rig (Liebherr, 2023)

Concrete agitator truck (Cottingham, 2023)

Plate 2.3 Example Construction Machinery for Tower/Pole Foundation Construction

2.3.2.2 Tower/Pole Assembly and Erection

The towers and poles would be transported to site in segments. They would either be fully assembled while lying on the ground then erected and bolted into the concrete foundations; or partially assembled on the ground, erected in segments, bolted together when erected, then bolted into the foundations.
Once erected and bolted into the concrete foundation, the towers would be ready for stringing.

Seven 4WD utes would be needed to facilitate construction worker movements between tower locations. A Franna crane would be used to assemble segments of the towers and poles, and a 130 t crane and EWP (**Plate 2.4**Error! Reference source not found.) would be used to erect the assembled structures.

2.3.2.3 Stringing of Lines 1 and 7

Conductors would be strung along Lines 1 and 7 with the following methodology. Brake and winch equipment would be used to string the lines. This equipment would be transported around site on the back of a Hiab truck. Seven utes would be required to transport construction personnel between tower locations, with one Franna crane, two 50 m elevated work platforms (EWPs), and one 10 t Hiab truck required for the stringing. Refer to Error! Reference source not found. for examples of these machines.

Brake and winch (from GJV)

EWP (Machmall, 2023)

Hiab truck (Banks Crane Hire, 2023)

Plate 2.4 Example Construction Vehicles for Conductor Stringing

The stringing would be undertaken in accordance with the following general methodology, noting that the construction methodology will be subject to detailed design and confirmation by the construction contractor once engaged.

1. The brake and winch are set up on the brake and winch pads in line with the pulling direction between towers/poles, with the conductor drum set in the drum carrier behind the brake. This is shown in Error! Reference source not found., in which the round conductor drums have been mounted behind the brake (the yellow machine), and the conductors are running from the tower to the brake. **Plate 2.5** also demonstrates this brake and winch setup, where the conductor is being pulled from tower 1 to tower 2. The winch is set up near tower 2 to pull the conductor from tower 1, where the brake is set up.

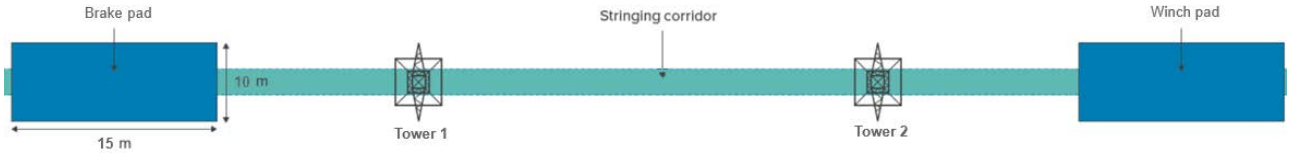


Plate 2.5 Example Brake and Winch Setup (from GJV)

2. A draw wire or rope is run through the towers being strung, and connected to the winch on one end and the conductor at the brake end. The draw wire is run along the ground between the towers, with protective 'hurdles' used for crossing fences and other infrastructure to prevent any damage from occurring when the draw wire is tensioned to pull through the attached conductor (see step 3).
3. Winching is commenced to the draw wire to increase the tension on the draw wire and attached conductor. The conductor is then pulled through to the winch tower under sufficient tension to ensure that it does not touch any obstructions such as trees or the ground.
4. Additional conductor drums are used to ensure that the conductor is long enough to reach the winch tower. If required, conductors are joined together using jointing sleeves installed at the brake tower.
5. Once the conductor is in place, it is secured to the brake and winch towers and the tension controllably released or increased to achieve the designed level of sag (the sag is the amount of 'drooping' between towers and prevents damage to the cables during changes in temperature (which causes the cables to expand or contract) or during weather events such as storms and high winds).
6. Once the sagging is complete, the conductor is cut and attached to the brake and winch towers at the required tension.

Drones will be used to carry the conductors between towers for stringing across sensitive areas, including nature reserves and the Murrumbidgee and Molonglo River corridors.

The new Line 1 and 7 alignments also need to be earthed to protect the structures and any nearby people or animals in the event of a conductor fault or lightning strike. An optical ground wire would be strung along the top of each transmission line as per the conductor stringing methodology for this purpose. Each tower and pole would also be grounded using strips of metal (e.g. copper) buried to a depth of approximately 1 m, which would be bonded to the base of the tower/pole footings and radiate outwards from the tower/pole footings. The metal strips would be installed during construction of the foundations (see **Section 2.3.2.1**).

The optical fibres in the optical ground wire would be used for communications, to either supplement the general use communications network in the region or for specific use by organisations such as the Department of Defence.

2.3.2.4 Connection of Lines 1 and 7 to the Transmission Network

Once Lines 1 and 7 have been constructed, Transgrid (not the GJV) would connect the lines into the existing transmission network. At the same time, existing Lines 1 and 7 would be disconnected. Transgrid would undertake the connection works over 24 hours in Spring or Autumn when there is low electricity demand. This will ensure that there is sufficient back-up on other parts of the network to support the customers powered by Lines 1 and 7, thereby preventing any loss of power and disruption to those users.

The connection and disconnection works would be undertaken in accordance with the following general procedure:

1. One of the existing lines would be turned off and disconnected from the transmission network (e.g. Line 1).
2. The corresponding new line (e.g. Line 1) would be connected to the network and turned on.
3. The new line would be tested to ensure it is operating as required.
4. The other line would be connected/disconnected as per the above procedure (e.g. Line 7).

2.3.2.5 Progressive Rehabilitation

The construction footprint will be progressively rehabilitated throughout the construction period in areas not occupied by permanent infrastructure (i.e. the new tower and pole footings). Excavations and cleared areas will be backfilled and levelled with subsoil and topsoil from earlier civil works. Where there is insufficient availability of subsoil and topsoil for site stabilisation works, virgin excavated natural material (VENM) would be imported on site and used for backfilling and levelling. Topsoil will be seeded with vegetation consistent with surrounding areas. This will be negotiated with the landholder of each property and is likely to involve reseeding of native grasses in most parts of the Proposal Area, except perhaps in areas already subject to grazing with specific vegetation requirements. This is discussed further in **Section 5.6.2**.

2.3.3 Demolition of Lines to be Removed

The existing towers and lines would be demolished in a similar manner to the construction of the new lines, but in reverse. Two 20 t excavators, one posi-track loader, one truck and dog, and up to three 4WD utes would be involved in the destringing and demolition activities. The existing towers to be removed would be accessed via existing access tracks and will not require upgrades to support the demolition works.

The following general methodology would be used:

1. The lines are de-strung using the brake and winch equipment.
2. The tower is cut off at the base using one excavator, with the other excavator holding onto the tower and lowering it to the ground in one piece.
3. The tower is cut into segments and loaded onto the truck and dog for transport off site.
4. The excavator is used to cut off the concrete foundation either below ground (up to 1 m below ground level) or above ground (up to 1 m above ground level). As agreed with each landholder, foundations in the Ginninderry urban development and rural farmland areas will be removed below ground level, while foundations in nature reserves will be left in situ to minimise disturbance.
5. The impacted areas within rural farmland and future urban areas are rehabilitated as per **Section 2.3.2.5**.
6. No ground disturbance or rehabilitation would be required within nature reserves.

Destringing and demolition of the existing lines would take place over a three-to-four month period. It would commence once stringing of the new lines is completed, in October 2026, and be completed in January 2027.

2.3.4 Operation and Maintenance

The new alignments are expected to be operational by the start of 2027, approximately 18 months after construction commences. Once operational, the assets would be owned and operated by Transgrid.

Maintenance of the Proposal infrastructure throughout its operational life would generally involve the following activities:

- Regular monitoring of tree height within transmission line exclusion zones and tree trimming if required, comprising LiDAR inspections every one to three years and vegetation inspections every three to six years.
- Inspections of the foundations and tower structures every six years.
- Cable inspections, comprising thermographic inspections every two to four years, earthing testing every 10 years, and cable insulation inspections between one and six times annually.
- Cable protection testing every six to eight years.
- Optical fibre testing once or twice each year.

The assets would be repaired or replaced as required. High voltage transmission lines such as the Proposal are designed to be operational for hundreds of years, although different assets would have different lifespans and will require repair or replacement throughout the operational life of the Proposal. As shown in **Table 2.8**, the steel tower/pole structures and conductors have a nominal lifespan of up to 94 years in a low corrosivity environment such as Canberra, while other assets such as the insulators and cable fittings have a nominal lifespan of 50–70 years so would require more frequent repair or replacement.

Table 2.8 Nominal Lifespan of Transmission Line Components in a Low Corrosivity Environment

Component	Sub-component	Nominal Lifespan (Years)
Steel tower	Steel tower structure	94
Steel pole	Steel pole	85
Guy wire	Guy wires and anchors	50
Conductor	Conductor	90
Conductor	Conductor fittings	70
Earth wire	Optical earth wire	90
Earth wire	Earth wire fittings	60
Insulator	Porcelain and glass disc insulators	50

Inspections would be undertaken by 4WD utes, drones or helicopters, while maintenance work would require a single 32 t bucket lifter truck.

2.4 Alternatives Considered

2.4.1 Preliminary Realignment Corridors

The location and design of the proposed transmission line realignments have been refined through an iterative options assessment process over several years, to reduce environmental, cultural and social impacts of the Proposal. Initially, four different realignment corridors were considered, as shown in **Figure 2.5**:

a. The northern-most option, extending from the ACT/NSW border to Stockdill Substation, crossing the Murrumbidgee River downstream of its confluence with the Molonglo River and north of the LMWQCC. The Line 7 diversion was on the NSW side of the border, but the Line 1 diversion was on the ACT side.

b. Similar to option A, but with both Line 1 and Line 7 diverting from the existing lines on the NSW side of the border.

c. Located south of options A and B and diverting from the existing lines further west of option B. The option crossed both the Molonglo and Murrumbidgee Rivers upstream of their confluence, passing to the north of the LMWQCC.

d. The southern-most option, crossing both the Molonglo and Murrumbidgee Rivers south of option C and passing to the south of the LMWQCC. The Line 7 diversion was on the NSW side of the border, but the Line 1 diversion was on the ACT side.

Options A, B and D were rejected for various reasons, as summarised in **Table 2.9**, with only option C identified for further consideration. Option C was the only option considered acceptable by all impacted landholders, albeit with further investigation into visual, ecological and heritage impacts and minor alignment adjustments to avoid some areas (e.g. the LMWQCC property).

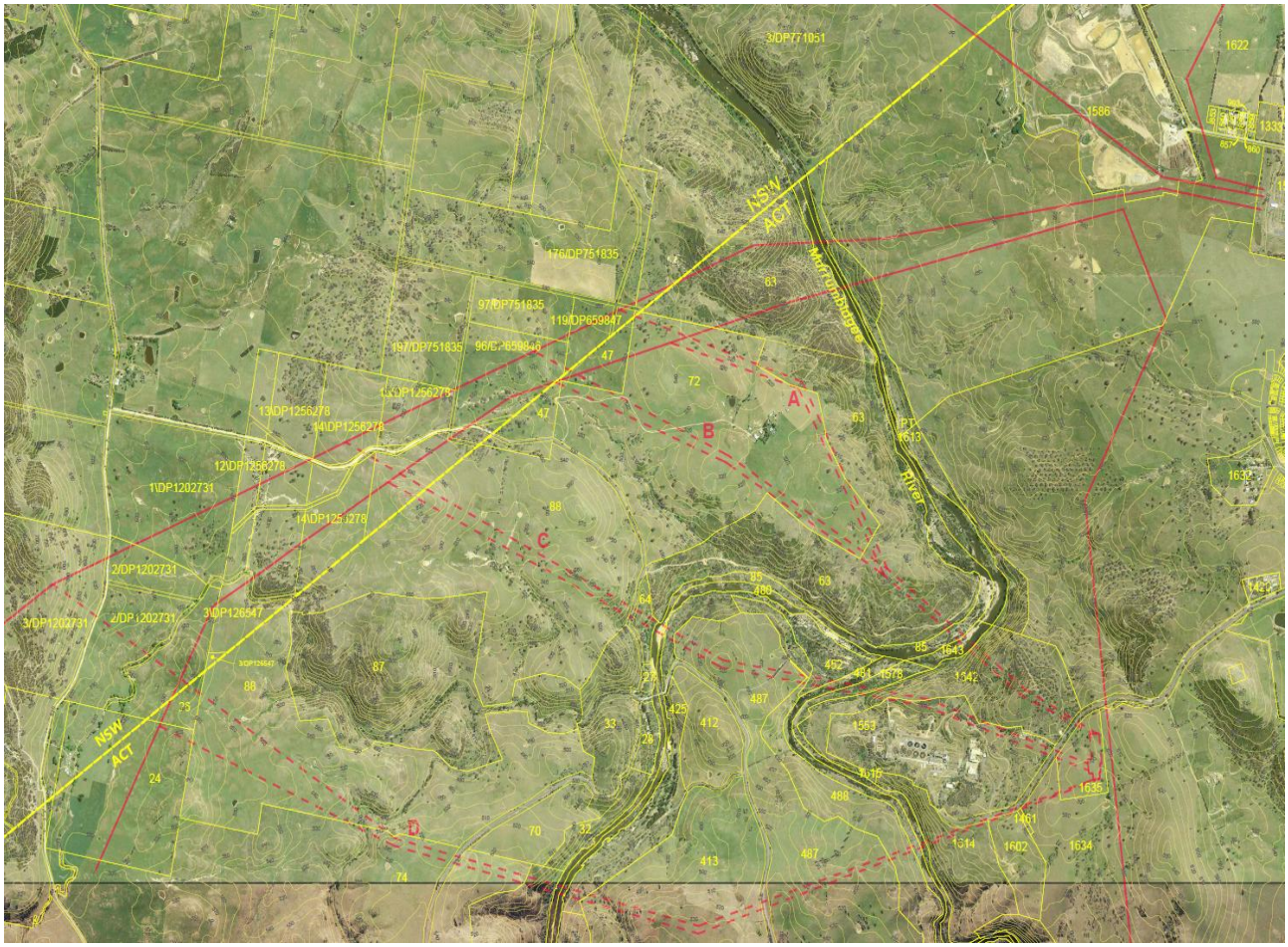


Figure 2.5 Initial Realignment Corridors Considered

Table 2.9 Comparison of Initial Realignment Corridors Considered

Realignment Corridor Option	Outcome	Reasons for Outcome
A	Rejected	• Option not acceptable to private landholder due to visual impacts on Woodstock Homestead. • Option not acceptable to PCS due to: o Visual and physical impacts on nature reserves along the Murrumbidgee River. o Visual impacts on Shepherds Lookout, the carpark on Stockdill Drive, and associated walking tracks.
B	Rejected	• As per option A.
C	Pursued	• Option acceptable to private landholders with further investigation into visual and physical impacts. • Option acceptable to Icon Water with further investigation into route options to avoid direct impacts on the LMWQCC property.
D	Rejected	• Option not acceptable due to divisions created on NSW properties. Also not acceptable to the SLA due to potential impacts on future urban development. • Potential significant impacts on the ACT heritage-listed Huntly property. • Additional line length would have resulted in additional capital costs and long-term maintenance costs, thereby reducing the feasibility of the Proposal.

2.4.2 Sub-options in Preferred Realignment Corridor

Five sub-options based on the option C alignment corridor were identified for further investigation (see **Figure 2.6**):

C1. The initial option C alignment with Lines 1 and 7 installed on separate towers. Crossed the Murrumbidgee River close to its confluence with the Molonglo River and passed through the northern end of the LMWQCC property. Was the most direct route between the existing lines and the Stockdill Substation.

C2. Similar to C1 but located as far north of the LMWQCC as possible. Crossed the Murrumbidgee River close to its confluence with the Molonglo River and passed through the northern end of the LMWQCC property.

C3. Followed the C1 and C2 alignments west of the Molonglo River, then diverted south to cross the Molonglo River south of the LMWQCC. Lines 1 and 7 were installed on the same towers. The towers would be up to twice the height of the other sub-options (approximately 60 m tall).

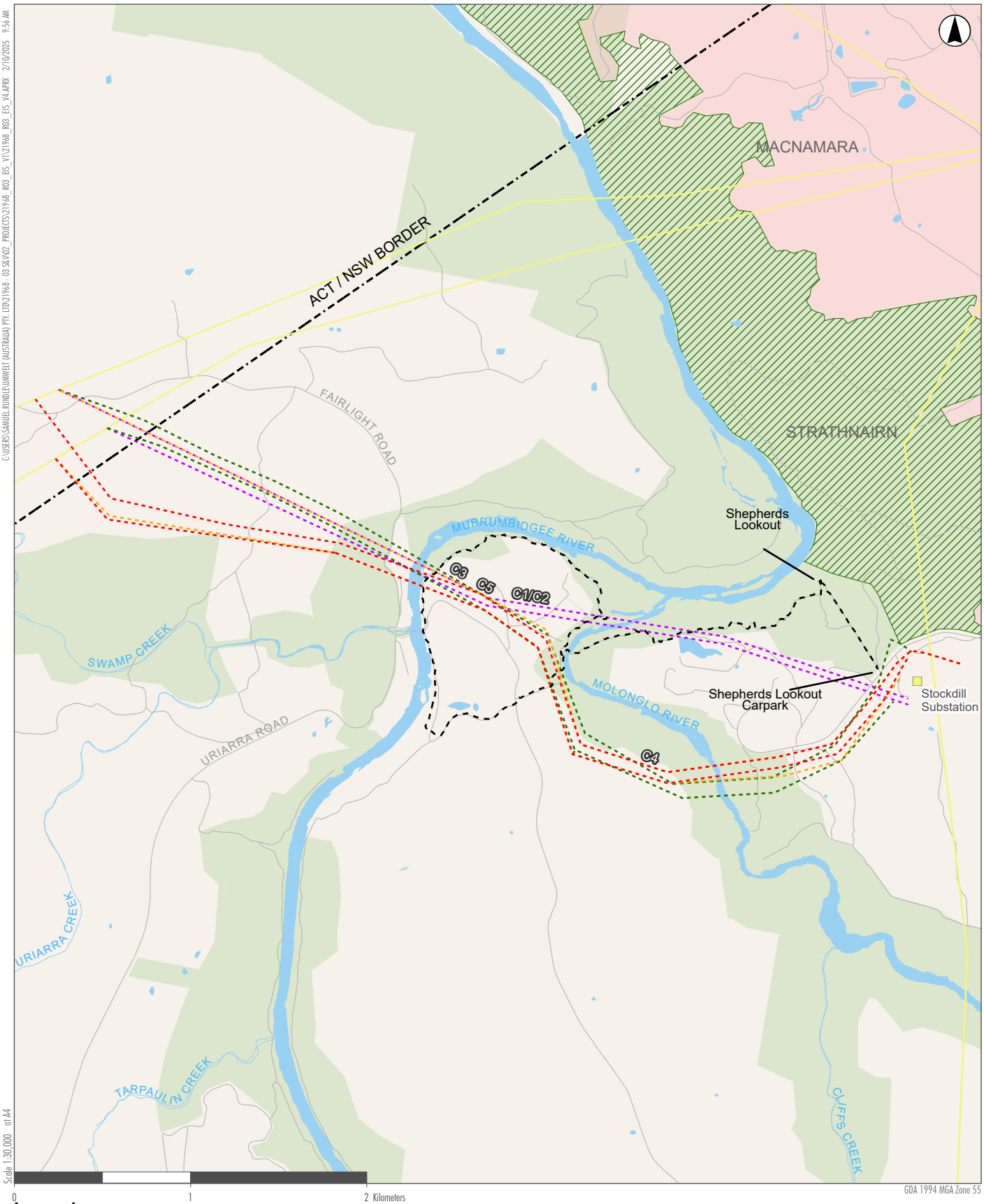
C4. The new alignments diverted from the existing lines further south of C1, C2 and C3 but crossed the Murrumbidgee River in a similar location. Line 7 followed the C1/C2 alignments to the north of the LMWQCC, while Line 1 followed the C3 alignment to the south of the LMWQCC.

C5. Similar to C4 but with both Line 1 and Line 7 passing to the south of the LMWQCC.

As summarised in **Table 2.10**, all sub-options other than C5 were rejected due to cultural impacts (tangible and intangible) associated with the transmission lines crossing the Murrumbidgee and Molonglo Rivers near their confluence, and impacts on the LMWQCC property and Shepherds Lookout from lines passing through the northern part of the LMWQCC property. In option C5, the transmission lines passed to the south of the LMWQCC and Shepherds Lookout, avoiding impacts on these two sites. This option was therefore taken forward for detailed investigation.

Table 2.10 Comparison of Initial Option C Sub-options Considered

Option C Sub-option	Outcome	Reasons for Outcome
C1	Rejected	• Option not acceptable to Representative Aboriginal Organisations due to cultural impacts (tangible and intangible) associated with crossing the confluence of the Murrumbidgee and Molonglo Rivers. • Option not acceptable to Icon Water due to infringement on northern boundary of the LMWQCC property. • Transgrid required the transmission lines to enter the Stockdill Substation from the north, which forced the lines to cross Shepherds Lookout entrance which was not acceptable to PCS.
C2	Rejected	• As per option C1.
C3	Rejected	• The taller towers would be more visually prominent and have greater potential for visual amenity and landscape character impacts. • Created an unacceptable engineering risk for Transgrid to have different lines on the same tower.
C4	Rejected	• As per option C1 in relation to Line 7.
C5	Pursued	• Option more acceptable to RAOs due to reduced cultural impacts, but a detailed cultural heritage assessment would be required. • Option acceptable to Icon Water due to no impacts on the LMWQCC property.



Legend

- C1/C2
- C3
- C4
- C5
- Shepherds Lookout/Uriarra Walking Track
- Existing Transmission Line
- NSW - ACT Border
- Road
- Drainage Line
- Watercourses
- Nature Reserve
- Railway Line
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development

FIGURE 2.6

Option C sub-options Identified for Further Consideration

Image Source: Data source: Geoscience Australia; Forestry Corporation of NSW (2019); DSFI (2020); NPWS Estate (2019); State Government of NSW and Department of Planning, Industry and Environment (2020); ACTMAPi (2022)

2.4.3 Concept Design for Preferred Sub-option and Minor Route Options

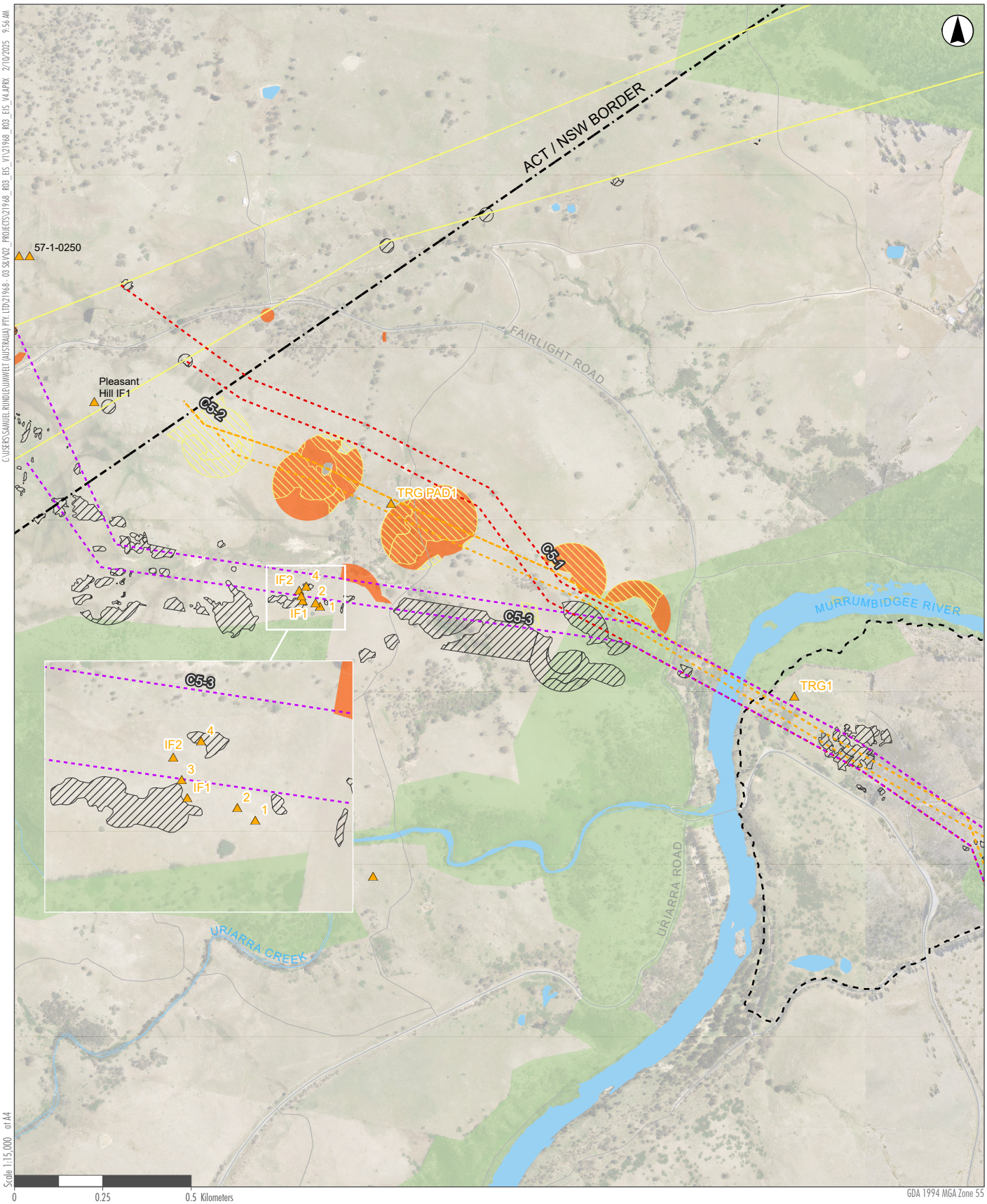
A concept design was prepared for option C5 by the GJV with input from Transgrid, including indicative tower locations and easement widths for the new alignments. This concept design initially included two sub-options for the north-western section of the new alignments, west of the Murrumbidgee River, for which potential ecological constraints were investigated. The northern option (C5-1) was ruled out based on a review of aerial imagery, which indicated that the alignment passed through rocky outcrops that were likely to provide habitat for the vulnerable pink-tailed worm-lizard (*Aprasia parapulchella*) (PTWL), and lower slopes that were likely to support the critically endangered EPBC Act listed White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (box gum woodland).

Umwelt undertook field surveys along the southern option (C5-2) in December 2021 to identify the presence of any EPBC Act and/or *Nature Conservation Act 2014* (NC Act) listed threatened ecological communities (TECs) or threatened species habitat present within 100 m of the proposed tower locations. As shown in **Figure 2.7**, the alignment was located across large areas of box gum woodland, potential PTWL habitat, and potential habitat for the vulnerable golden sun moth (*Synemon plana*).

Past Traces undertook field surveys along C5-2 on 20–21 January 2022 and 24 February 2022 with members of three RAOs (Mirrabee, King Brown Tribal Group and Ngarigu Currawong Clan). Two previously recorded Aboriginal heritage sites, one new site and four areas of potential archaeological deposit (PAD) were found within the study area, but in locations where impacts would not occur based on the preliminary design, although one of the sites was immediately below the proposed alignment near the ACT/NSW border (see **Figure 2.7**). No changes to the Proposal layout were made as a result of the preliminary cultural heritage assessment (CHA). However, the confirmation of Aboriginal cultural heritage in the Proposal Area meant that any future design changes had to be carefully considered in relation to cultural heritage and with continued input from the RAOs.

Due to the presence of the ecological values along C5-2, a third option was identified to avoid these impacts, located to the south of C5-2. As shown in **Figure 2.7**, this option (C5-3) was located across much smaller areas of box gum woodland and potential PTWL habitat, while the extent of potential GSM habitat was similar. Due to the smaller impacts of C5-3 compared to C5-2, C5-3 was progressed as the preferred alignment for the EIS. The CHA was updated based on a subsequent site walkover with the RAOs. Some additional Aboriginal cultural heritage sites were found near the ACT/NSW border within the alignment corridor, but in a location where direct impacts would not occur (see **Figure 2.7**). This is discussed further in **Chapter 8.0**.

The preferred alignment, C5-3, was subject to subsequent micrositing to further avoid and minimise ecological impacts where possible, as discussed in **Section 2.4.4**.



Legend

- Aboriginal Sites
- Pink-tailed Worm-lizard Habitat
- Potential Golden Sun Moth Habitat
- Natural Temperate Grassland
- Box Gum Woodland
- Shepherds Lookout/Uriarra Walking Track
- Existing Transmission Line
- NSW - ACT Border
- Road
- Drainage Line
- Watercourses
- Nature Reserve
- Railway Line

Initial Re-alignment Corridors

- C5-1
- C5-2
- C5-3

FIGURE 2.7

C5 sub-options Subject to Preliminary Investigations

Image Source: Data source: Geoscience Australia; Forestry Corporation of NSW (2019); DSFI (2020); NPWS Estate (2019); State Government of NSW and Department of Planning, Industry and Environment (2020); ACTMAPi (2022)

2.4.4 Micrositing of Preferred Sub-option

Once the preferred alignment (C5-3) was selected, detailed ecological investigations were undertaken to identify any further opportunities to avoid and minimise biodiversity impacts. In particular, the location of mature and hollow-bearing trees was mapped along the new alignments. As shown in **Figure 2.8**, these trees were clustered towards the eastern end of the new alignments, east of the Molonglo River, and west of the Murrumbidgee River. Due to the height of the conductors over the rivers and the small gully to the west of the Murrumbidgee River where the trees were recorded (see **Figure 2.8**), it was confirmed that the Proposal would not require any of these trees to be removed or lopped to comply with canopy height restrictions beneath powerlines.

The alignment corridor east of the Molonglo River is much more constrained than the sections to the west, as the new transmission lines need to connect to existing towers located on the northern side of the Stockdill Substation without infringing upon the adjacent Territory Battery site. Due to these engineering constraints, it became apparent that the Proposal would not be able to completely avoid woodland and mature trees located along Stockdill Drive. As such, a vegetation clearance zone was mapped around the new alignments to identify the maximum extent of swing and sag that the conductors would be subject to during periods of high wind and temperatures where trees would need to be removed or lopped if above 6 m tall, in accordance with Transgrid requirements for transmission lines.

In December 2022, Umwelt ecologists undertook a field survey with GJV and Transgrid personnel to identify high value habitat trees that should be prioritised for retention. This resulted in micrositing of some tower locations to avoid higher value trees, and the decision to use poles instead of towers to further increase the height of the conductors above the canopy and minimise tree impacts. As shown in **Figure 2.8**, 24 mature trees were avoided through these design decisions. Ultimately, six mature trees would need to be removed and an additional ten trees would need to be lopped. These impacts are considered unavoidable.

The civil design was able to commence once the tower and pole locations were finalised. To inform the location of site access tracks and construction laydown areas, areas of rock visible in aerial imagery were mapped as potential PTWL habitat for avoidance. Woodland areas were also mapped as potential box gum woodland for avoidance. As shown in **Figure 2.9**, the new access tracks and laydown areas avoided almost all potential PTWL habitat and box gum woodland, except in highly constrained areas adjacent to Stockdill Drive. Field mapping of the civil design was undertaken to verify the desktop mapping, and determined that the civil works would impact small patches of low quality box gum woodland and potential PTWL habitat. This is discussed further in **Chapter 5.0**.

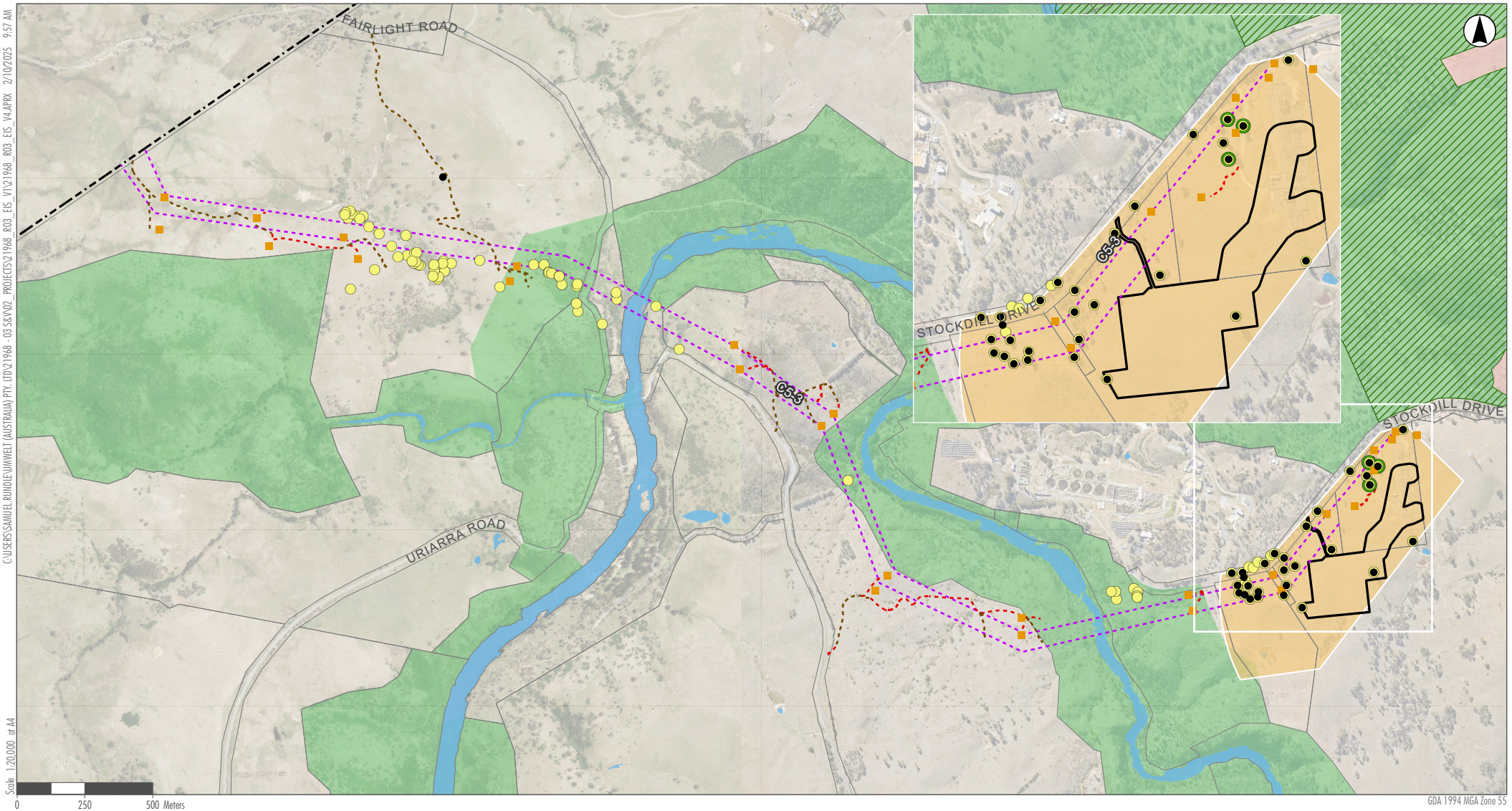
2.4.5 No Development and Consequences of Not Proceeding

As outlined in **Section 1.3** there is a strong social, amenity, environmental and commercial justification for development of the Proposal. The removal of part of the existing Lines 1 and 7 would enable the creation of an additional 430 residential properties within the Ginninderry residential development. This will provide much needed housing for Canberra's growing population (ACT Government, 2022). The removal of this transmission infrastructure would also improve visual amenity for Ginninderry residents, local rural landholders and public land users in the area, particularly for users of Shepherds Lookout and the Ginninderry Conservation Corridor. Visual impacts are discussed further in **Chapter 9.0**.

Although the Proposal would have a direct impact on native vegetation and potential threatened species habitat during construction of the new alignments, the impact would be small relative to the large overall operational footprint of the new lines (the Proposal has a construction footprint of 10.9 ha, of which 4.9 ha is native vegetation, but requires 61.3 ha for operation). In addition, the Proposal would result in a net reduction of transmission infrastructure within nature reserves, which would allow for improved conservation outcomes in the future. As transmission line infrastructure is already present within the landscape, potential environmental impacts of the Proposal during operation would be consistent with existing conditions and a 'no development' scenario (e.g. powerline collision risk for avifauna). Potential biodiversity impacts are discussed further in **Chapter 5.0**.

The Proposal is anticipated to have a net benefit equivalent to approximately $70 million in present value, based on a cost-benefit analysis undertaken by the CIE (see **Appendix G8**). All stakeholders involved in or potentially affected by the Proposal would be subject to a net benefit, including landholders, public land users, Transgrid (as the future operator of the assets), and the GJV.

The option of no development is therefore considered to be an undesirable option that would not benefit the ACT.



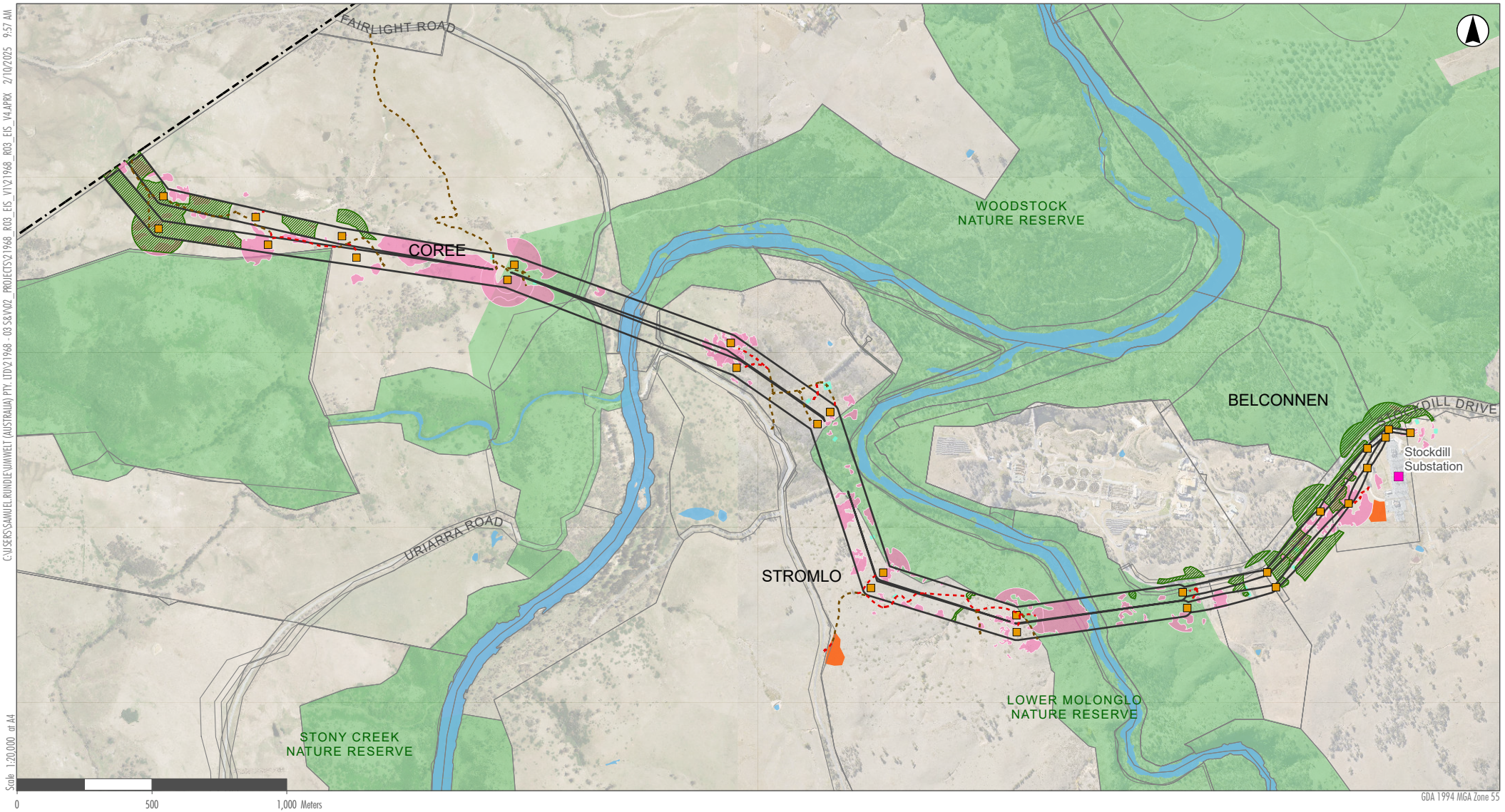
Legend

- Potential Gang-gang Cockatoo Breeding Tree
- Hollow-Bearing Tree
- Mature Tree
- New Alignment - New Towers
- Access Tracks - Existing
- Access Tracks - New
- Initial Re-alignment Corridors (C5-3)
- Territory Battery
- Superb Parrot Tree Assessment Area
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development

FIGURE 2.8

Location of Mature and Hollow Bearing Trees Informing Micrositing

Image Source: Nearmap (2023) Data source: ACT Government (2023)



Legend

- New Towers
- Existing Substation
- New Alignment
- Potential Box Gum Woodland
- Potential Pink-tailed Worm-lizard Habitat
- Property Boundaries
- ACT/NSW Border
- Watercourses
- Nature Reserves
- Access Tracks - New
- Access Tracks - Existing

Construction Components

- Brake and Winch Pull Zones
- Construction Laydown Areas

FIGURE 2.9

Location of Habitat Informing Micrositing

Image Source: Nearmap (2022) Data source: ACT Government (2021)

3.0 Legislative and Strategic Context

Chapter Summary
This chapter provides an outline of the Territory, State and Commonwealth legislation and planning policies applicable to the Proposal. The Proposal is being assessed under the ACT *Planning and Development Act 2007* as per the transitionary arrangements in the new *Planning Act 2023.*

3.1 Statutory Requirements

This EIS has been prepared with consideration of the following legislation:

- ACT legislation:
  - *Planning Act 2023* (new Planning Act)
  - *Planning and Development Act 2007* (PD Act)
  - Planning and Development Regulation 2008 (PD Regulation)
  - *Environment Protection Act 1997* (EP Act)
  - Environment Protection Regulation 2005 (EPR)
  - *Emergencies Act 2004* (Emergencies Act)
  - *Heritage Act 2004* (Heritage Act)
  - *Water Resources Act 2007* (WR Act)
  - *Nature Conservation Act 2014* (NC Act)
  - *Urban Forest Act 2023* (UF Act).
- Commonwealth legislation
  - *Australian Capital Territory (Planning and Land Management) Act 1988* (PALM Act)
  - *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
  - Environment Protection and Biodiversity Conservation Regulations 2000 (EPBC Regulations)
  - *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (ATSIHP Act)
  - *Native Title Act 1993* (NT Act).

Each of these instruments are considered separately in the following sections.

3.1.1 ACT Legislation

3.1.1.1 Planning Act 2023

The new Planning Act replaced the PD Act on 27 November 2023. However, this EIS has been prepared in accordance with the PD Act rather than the new Planning Act, as per the transitional arrangements in Section 636 of the Planning Act. The provisions of Section 636 are applicable to EIS processes that have commenced but not been completed before 27 November 2023. They specify that Chapter 8 of the PD Act

(other than Division 8.2.1) continues to apply to a project in this situation. This is applicable to the Proposal as the EIS Scoping Document was issued under Division 8.2.2 and this EIS is being prepared in accordance with Division 8.2.3.

Further information about the PD Act is provided in **Section 3.1.1.2** below.

3.1.1.2 Planning and Development Act 2007

The PD Act fulfils the requirements of the *Australian Capital Territory (Planning and Land Management) Act 1988* (PALM Act) (see **Section 3.1.2.1**) in establishing the ACT planning and land authority currently known as the EPSDD. The EPSDD is responsible for approving development in all areas of the ACT, except for Commonwealth Land, and designated areas which are of national significance.

The EPSDD administers the Territory Plan, which is the primary statutory planning document against which development projects are assessed. The ACT planning system has a track-based system for assessing developments. A development will fall into one of three assessment tracks depending upon several factors such as its location, size, and potential impact on the surrounding area, as prescribed by the Territory Plan, being the code, merit, or impact track. The code track applies to simpler developments, while the impact track is for developments that have the potential for a major environmental impact and are therefore subject to the highest level of regulatory scrutiny. Most developments are assessed under the merit track.

Under Section 123 of the PD Act, an EIS must be prepared where the impact track applies. The Proposal meets this requirement as it involves an activity or process specified in Schedule 4 of the PD Act. Consequently, an EIS must be completed prior to a development application (DA) being lodged under the impact track. Part 4.2, Schedule 4 of the PD Act identifies activities that require an EIS for development projects, and Part 4.3 identifies areas and processes that require an EIS. The items within Part 4.2 and Part 4.3, reproduced in **Table 3.1** below, are relevant to the Proposal.

On the basis of these triggers, the Proposal falls into the impact track and an EIS must therefore be prepared. As required under Part 8 of the PD Act, the EPSDD provided a Scoping Document outlining the matters which this EIS must address. The Scoping Document can be found at **Appendix A**.

Table 3.1 ***Planning and Development Act 2007*** **Triggers**

Item	Trigger	Relevance to the Proposal
Part 4.2, Schedule 4: Development Project requiring EIA - activities		
2	Proposal that involves – (a) electricity transmission line construction, including additions or realignment works, outside an existing easement or exceeding 500 m in length, that are intended to carry underground or above-ground transmission lines with a voltage of 132 kV or more; or (b) a coal generating station; or (c) an electricity generating station (other than a coal generating station) including gas, wind, hydroelectric, geothermal, bio-material, solar power or co-generation – (i) that is capable of supplying – (A) the amount of electrical power prescribed by regulation; or (B) if no amount is prescribed – 4 MW or more of electrical power; or (ii) in a location or of a kind or nature prescribed by regulation; or (d) an electricity generating station if the temperature of water released from the station into a body of water (other than an artificial body of water) is likely to vary by more than 2°C from the ambient temperature of the body of water.	The Proposal involves the realignment of two above-ground transmission lines exceeding 500 m in length (5.7 km for the Line 1 and 5.6 km for the Line 7 new alignments), each with a voltage of 330 kV. The Proposal therefore triggers Item 2(a).
Part 4.3, Schedule 4: Development Project requiring EIS – areas and processes		
1	Proposal that is likely to have a significant adverse environmental impact on 1 or more of the following, unless the Conservator of Flora and Fauna produces an environmental significance opinion that the proposal is not likely to have a significant adverse environmental impact: (a) a critically endangered species; (b) an endangered species; (c) a vulnerable species; (d) a conservation dependent species; (e) a regionally threatened species;	The Proposal would impact two TECs and habitat for several different threatened species. As discussed in **Chapter 5.0**, the Proposal may have a significant impact on an endangered and vulnerable threatened species. The Proposal was referred to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) in November 2024 (EPBC 2024/10058). The NSW component of the broader project was referred under a separate referral (EPBC 2024/10057). A determination under the EPBC Act was made on 7 February 2025, with both components of the Project determined to be not a controlled action. Further detail is provided in **Chapter 5.0**.

Item	Trigger	Relevance to the Proposal
	(f) a regionally conservation dependent species; (g) a provisionally listed threatened species; (h) a listed migratory species; (i) a threatened ecological community; (j) a protected native species; (k) a Ramsar wetland; (l) any other protected matter.	
2	Proposal involving – (a) the clearing of more than 0.5 ha of native vegetation in a native vegetation area, other than on land that is designated as a future urban area under the Territory Plan, unless the Conservator of Flora and Fauna produces an environmental significance opinion that the clearing is not likely to have a significance adverse environmental impact; or (b)…	The Proposal would impact 4.91 ha of native vegetation, and therefore triggers Item 2(a). Further detail is provided in **Chapter 5.0**.
3	Proposal for development in a reserve…	Four towers would be constructed within land that is subject to a nature reserve overlay. The Proposal therefore triggers Item 3.
6	Proposal that is likely to have a significant adverse impact on the heritage significance of a place or object registered under the *Heritage Act 2004*.	A large portion of the Proposal Area is subject to a heritage listing on the ACT Heritage Register as containing known Aboriginal sites and potential archaeological deposits. The historic Huntly pastoral property is also located in the vicinity of the new alignments. A Cultural Heritage Assessment (CHA) has been undertaken for the Proposal. Through this process, impacts on known Aboriginal cultural heritage and the heritage values of the Huntly property have been avoided. The Proposal does not therefore trigger Item 6. Further details are provided in **Chapter 8.0.**

3.1.1.3 Planning and Development Regulation 2008

The Planning and Development Regulation 2008 (PD Regulation) provides the requirements associated with the preparation of an EIS, including:

- The minimum information to be provided in the EIS.
- Requirements for the EPSDD and other agencies for providing input during preparation and referral of the EIS Scoping Document, including applicable timeframes.
- The minimum information to be provided in an EIS Scoping Document.
- The criteria for consultants preparing an EIS.

3.1.1.4 Environment Protection Act 1997

The *Environment Protection Act 1997* (EP Act) was established to protect the environment from pollution and its effects, and to provide a regulatory framework to reduce and eliminate the discharge of pollutants into the air, land and water. The EP Act establishes the Environment Protection Authority (EPA) as the statutory decision maker for environmental regulation and policy. The EPA administers legislation covering air and water quality, waste, contaminated land, noise, pesticides, and hazardous waste through the provisions of the Environment Protection Regulation 2005 (EPR).

The EP Act includes a number of objectives designed to protect the environment, such as preventing environmental degradation and risk of harm to human health by promoting pollution prevention and reuse and recycling of materials. The EP Act also recognises that environmental decision-making must have appropriate regard for economic and social considerations. The EP Act, when made in 1997, embodied the ecologically sustainable development (ESD) principles endorsed by the Australian Intergovernmental Agreement on the Environment, to which the ACT is a Signatory (Council of Australian Governments, 1997).

The EP Act requires that an environmental authorisation be obtained for activities that may have a substantial environmental impact. An authorisation sets out the conditions under which the activity may be conducted. These activities are listed as class A activities in Schedule 1 of the EP Act. The Proposal is not a class A activity so would not require an environmental authorisation under the EP Act.

The EP Act is supported by the Environment Protection Regulation 2005 (EPR), which sets out provisions for the protection of the environment from emissions relating to air quality, noise, water quality and controlled waste. The EPR also lays out requirements for erosion and sediment control, and specifies noise zones and standards and ambient environmental standards.

Eight Environment Protection Policies (EPPs) have been developed by the EPA to assist with the implementation of the EP Act and EPR in relation to particular areas of environment protection. The EPPs are not legally binding but are used by the EPA in determining any conditions of an environmental authorisation (EPA, 2016). The five policies provided in **Table 3.2** are relevant to the Proposal and have been addressed in this EIS.

Table 3.2 Environment Protection Policies Relevant to the Proposal

Environment Protection Policy	Description	Relevant EIS Section
General	The General EPP provides information to assist with understanding the EP Act and EPR. It provides a simplified explanation of the EP Act and EPR and their administration. The EP Act establishes a general environmental duty that requires all people to take practicable and reasonable steps to prevent or minimise any environmental harm or nuisance that their actions may cause.	This EIS lays out the measures that have been and will be implemented to avoid and minimise potential environmental impacts of the Proposal. **Chapter 18.0** provides a summary of these commitments, as informed by the specialist technical investigations detailed in **Chapter 5.0** to **Chapter 16.0**.
Water Quality	The Water Quality EPP provides information about the maintenance and enhancement (where appropriate) of the ACT's water quality by minimising or eliminating water pollution. ACT water catchments are categorised under the Territory Plan as Conservation, Water Supply, or Drainage and Open Space. Each category has a water use policy that lays out the specific objectives and environmental values for particular waterways. The EPA uses these environmental values to determine water quality objectives and whether pollution has occurred or is occurring.	The Proposal Area is located within the Conservation and Drainage and Open Space water use catchments. The water impact assessment in **Chapter 7.0** involved consideration of the objectives and policies relevant to these catchment categories.
Contaminated Sites	The Contaminated Sites EPP provides information and policies relating to the assessment, remediation, management and audit of contaminated land. It aims to minimise the risk of adverse impacts of contaminated land on the environment and human health.	A preliminary site investigation has been undertaken for the Proposal to identify whether any potential sources of contamination are present in the Proposal Area. The results of this investigation are discussed in **Chapter 6.0**.
Noise	The Noise EPP provides information about noise requirements of the EP Act and EPR in relation to business activities (including the commercial, industrial and construction sectors and government), and people's activities in and around the home. Under the EPR, the ACT is divided into noise zones based on the land use policies defined by the Territory Plan. An activity is considered to cause environmental harm under the EPR if its noise levels exceed the noise standards specified for the relevant noise zone.	The noise impact assessment described in **Chapter 10.0** was undertaken in accordance with the noise zones and noise standards stipulated in the EPR.
Air	The Air EPP provides information and policies relating to the management of ambient air quality and pollutant emissions to the atmosphere in the ACT. The objectives of the Air EPP are to ensure air quality in the ACT meets national standards for ambient air at a minimum, and to minimise environmental harm from local emissions of air pollutants consistent with the requirements of the EP Act.	Potential air quality impacts of the Proposal are considered in **Chapter 12.0**.

3.1.1.5 Emergencies Act 2004

The *Emergencies Act 2004* (Emergencies Act) was developed in response to the Report of the McLeod Inquiry into the operational response to the January 2003 bushfires in the ACT. The Emergencies Act consolidates all previous emergency legislation in the ACT, provides for different declarations in an emergency or impending emergency, and establishes the ACT Bushfire Council as an advisory body to the Minister for Police and Emergency Services.

The ACT's primary bushfire planning instrument, the Strategic Bushfire Management Plan (SBMP), is administered under the Emergencies Act. The SBMP establishes the basis and framework for the efficient, effective and comprehensive management of fire and fire-related activities for protecting human life, property, assets and the environment. The SBMP is considered in the bushfire risk assessment (see **Chapter 15.0**).

3.1.1.6 Heritage Act 2004

The purpose of the *Heritage Act 2004* (Heritage Act) is to provide recognition, registration and conservation of places and objects of natural and cultural significance in the ACT. The Heritage Act establishes the ACT Heritage Council, which is an independent body responsible for providing advice on appropriate conservation of cultural, natural, and Aboriginal heritage places and objects throughout the ACT.

The ACT Heritage Council is responsible for keeping a register of places and objects in the ACT which have heritage significance at the Territory level. A place or object must meet at least one of the heritage significance criteria outlined in the Act to be entered in the Heritage Register.

The criteria are:

- Importance to the course or pattern of the ACT's cultural or natural history.
- Has uncommon, rare, or endangered aspects of the ACT's cultural or natural history.
- Potential to yield information that would contribute to an understanding of the ACT's cultural or natural history.
- Importance in demonstrating the principal characteristics of a class of cultural or natural places or objects.
- Importance in exhibiting particular aesthetic characteristics valued by the ACT community or a cultural group in the ACT.
- Importance in demonstrating a high degree of creative or technical achievement for a particular period.
- Has a strong or special association with the ACT community, or cultural group in the ACT for social, cultural or spiritual reasons.
- Has a special association with the life or work of a person, or people, important to the history of the ACT.

The Heritage Act has been considered in this EIS through the preparation of a CHA and assessment of heritage values in the Proposal Area. The region surrounding the Proposal Area contains a large number of known Aboriginal heritage sites and has important tangible and intangible values to First Nations people. The historic Huntly pastoral property is also located near the new alignments. The Proposal has avoided impacts on all known Aboriginal and European heritage values through strategic siting of Proposal infrastructure. This is discussed further in **Chapter 8.0**.

3.1.1.7 Water Resources Act 2007

The *Water Resources Act 2007* (WR Act) aims to ensure that the management and use of water resources in the ACT is sustainable, while protecting the ecosystems that depend on those resources. It also provides for the protection of aquatic ecosystems and aims to reverse any damage that has already occurred to those ecosystems where practicable.

The WR Act requires that licences be obtained for a number of different activities, such as work in a waterway or construction of a water structure (a dam or any other water retention structure) with a capacity of more than 2 megalitres (ML). The Proposal would not require a waterway work licence as no work would be undertaken in a waterway and no construction of water structures will occur.

3.1.1.8 Nature Conservation Act 2014

The *Nature Conservation Act 2014* (NC Act) is the primary legislation which provides for the protection of native plants and animals in the ACT, and for the management of the conservation reserve network. The NC Act establishes the ACT Conservator for Flora and Fauna (the Conservator), PCS and other various committees. The NC Act also lists threatened native species and ecological communities to be protected in the ACT; outlines the requirement for action plans for declared threatened species and ecological communities; provides a regime for offences, licences, and penalties; and outlines monitoring, compliance and enforcement activities.

A biodiversity assessment has been prepared for the Proposal, involving desktop review and field surveys to identify the presence of native fauna and flora within the Proposal Area and to ascertain the extent of any impacts. No threatened flora species have been recorded within the Proposal Area, however 2.37 ha across 11 areas of Yellow Box –Blakely's Red Gum Grassy Woodland and derived native grassland (of which 2.29 ha is in the derived state), and less than 0.01 ha of Natural Temperate Grassland, which are listed TECs under the NC Act, occur in the Proposal Area. The Proposal Area also contains potential habitat for superb parrot, gang-gang cockatoo and other woodland birds, PTWL, and GSM, which are listed threatened species under the NC Act. Potential impacts of the Proposal on these matters are discussed in **Chapter 5.0**.

3.1.1.9 Urban Forest Act 2023

The *Urban Forest Act 2023* (UF Act) sets out the following provisions for the protection of trees in areas of 'urban forest' in the ACT (built-up urban areas, future urban areas or areas subject to an estate development plan):

- Establishment of a register of trees of high importance with appropriate levels of protection.
- Establishment of comprehensive tree protection measures to be applied in areas where urban forest values are at risk of degradation.
- Approval of tree damaging activities.
- Approval of groundwork activities within the protection zone of a protected tree.
- Approval of tree management plans.
- Offence and enforcement provisions.
- Ability for the Conservator to make directions regarding tree protection matters.
- Establishment of a tree advisory panel.

Part of the Proposal Area is located within built-up urban areas in Belconnen and the Western Belconnen FUA. The new alignments are not located in areas of urban forest. Trees to be removed as part of the Proposal are located within the new alignments so are not regulated by the UF Act. No trees located along the lines to be removed which are regulated by the UF Act, would be impacted by the Proposal.

Chapter 5.0 provides details about the trees that may be impacted by the Proposal and measures that will be used to avoid and mitigate impacts on trees.

3.1.1.10 Climate Change and Greenhouse Gas Reduction Act 2010

The *Climate Change and Greenhouse Gas Reduction Act 2010* sets targets for greenhouse gas emissions and renewable energy use/generation for the ACT, facilitating the ACT Government's development of policies and programs to meet the targets and address and adapt to climate change, and to encourage private entities to take action to address climate change.

As a transmission line project, the Proposal does not directly contribute to meeting these targets, although it does ensure the continuity of a reliable electrical connection and supply of renewable energy to the ACT and broader NEM. However, by moving the existing lines out of the Western Belconnen FUA and increasing the availability of housing in Ginninderry, the Proposal will indirectly contribute towards the provisions of the Act, including the transition from gas to electricity with no new gas connections in new suburbs. The Ginninderry residential development is a 6 star Green Star community certified development which promotes and creates infrastructure, transport and buildings with reduced ecological footprints. It not only provides greenhouse gas emission reductions, but also assists with climate adaptation with increased energy resilience. On-site renewable energy generation, batteries and leadership in electrification (turning off gas) have already provided significant benefits to the Territory. Ginninderry is now also looking to remove greenhouse gas emissions from transport, planned centres, commercial areas, schools and other facilities.

3.1.2 Commonwealth Legislation

3.1.2.1 Australian Capital Territory (Planning and Land Management) Act 1988

The introduction of self-government for the ACT in 1988 created a circumstance where two governments, the Australian Government and the ACT Government, would share responsibility for further development of the Territory. The PALM Act allows for land used by or on behalf of the Commonwealth to be declared National Land and be managed by the Commonwealth. The remaining lands of the Territory are classified as Territory Land to be managed by the ACT Government on behalf of the Commonwealth.

Through the PALM Act, the ACT Legislative Assembly is required to make laws to establish a territory planning authority. The role of this authority is to prepare and administer a territory plan for developing land within the ACT, other than designated areas, in a manner that is not inconsistent with the National Capital Plan (NCP). The purpose of the NCP is to ensure that the Commonwealth's national capital interests in the Territory are fully protected, without otherwise involving the Commonwealth in matters that are relevant only to the ACT community. **Section 3.2.1** provides more information about the NCP.

In order to maintain a broad oversight of planning in the Territory as a whole and to ensure its involvement in the planning, design and development of National Land, the Commonwealth established the National Capital Authority to reflect its interests and carry out its intentions. The National Capital Authority is responsible for administering the NCP, while the ACT Government is responsible for the normal day-to-day planning and development matters under the Territory Plan (see **Section 3.2.2**).

3.1.2.2 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act provides a legal framework for the protection and management of nationally and internationally important flora, fauna, ecological communities and heritage places. Under the EPBC Act, approval is required from the Commonwealth Minister for the Environment for Proposals that are:

- likely to have a significant impact on a matter of national environmental significance (MNES), or
- likely to have a significant impact on the environment in general (for actions by Commonwealth agencies or actions on Commonwealth land) or the environment on Commonwealth land.

MNES include:

- Nationally threatened species and ecological communities
- Migratory species
- World heritage properties
- National heritage properties
- Wetlands of international importance (listed under the Ramsar Convention)
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- nuclear actions (including uranium mines)
- a water resource, in relation to coal seam gas development and large coal mining development.

The Proposal was referred to DCCEEW in November 2024 due to the potential for impacts on EPBC Act listed threatened species and ecological communities. Due to the cross-jurisdictional nature of the Proposal, the Proposal required split referrals under the EPBC Act and was unable to be assessed under either the ACT or NSW bilateral assessment processes. Two referrals were therefore submitted for the Proposal: One for the ACT component of works (EPBC 2024/10058) and the other for the NSW component of works (2024/10057). A decision was made on 7 February 2025, with both components being determined not a controlled action.

In accordance with the Scoping Document (**Appendix A**), potential impacts of the Proposal on EPBC Act listed threatened species and communities have been considered as part of this EIS, in addition to the EPBC Act referrals (see **Chapter 5.0**).

3.1.2.3 Environment Protection and Biodiversity Conservation Regulations 2000

The Environment Protection and Biodiversity Conservation Regulations 2000 (EPBC Regulations) provide the requirements for submitting a referral to the relevant Commonwealth Government department (currently DCCEEW), including the information to be provided in a referral. This information was provided in the two referrals submitted for the Proposal in July 2024, as detailed in **Section 3.1.2.2**.

3.1.2.4 Aboriginal and Torres Strait Islander Heritage Protection Act 1984

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (ATSIHP Act) allows the Commonwealth Minister for the Environment, on the application of an Aboriginal person or group of persons, to make a declaration to protect an area, object or class of objects from a threat of injury or

desecration. The ATSIHP Act was passed to enable the Commonwealth an opportunity to intervene and where necessary preserve and protect areas and objects of particular significance to Aboriginal or Torres Strait Islander people.

There are no known Commonwealth-listed Aboriginal heritage objects or places within the Proposal Area. Refer to **Chapter 8.0** for further information.

3.1.2.5 Native Title Act 1993

The *Native Title Act 1993* (NT Act) provides a national system for the recognition and protection of native title and for its co-existence with the national land management system. Native title recognises the rights and interests of Aboriginal and Torres Strait Islander people in land and waters according to their traditional laws and customs. It recognises the right to perform certain activities which come from traditional laws and customs but does not recognise those traditional laws and customs themselves. These activities may include the right to camp, hunt, use water, hold meetings, perform ceremony, and protect cultural sites.

There are no native title claims within the Proposal Area.

3.1.3 NSW Legislation

The NSW component of the larger project that is located on freehold land is being separately assessed under the NSW EP&A Act. Part 5 of the EP&A Act sets out the environmental assessment requirements that apply to activities undertaken by or on behalf of a public authority or which requires the approval of a public authority, such as Transgrid. For activities subject to assessment under Part 5, Section 5.5 of the EP&A Act imposes a duty on a determining authority to "examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment" by reason of the proposed activity. Additionally, Section 5.7 requires the public authority to determine whether an activity is "likely to significantly affect the environment" and if so, to not carry out or grant approval relating to the activity unless an EIS has been prepared for the activity and considered by the authority.

Clause 171 of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation) contains an obligation to consider the likely impacts of an activity on the environment and to prepare a Review of Environmental Factors (REF) demonstrating how the environmental factors provided in the NSW Department of Planning and Environment's Guidelines for Division 5.1 assessments have been taken into account by the authority when considering the likely impact of the activity.

An REF will therefore be prepared to consider potential environmental impacts, avoidance, and mitigation measures relating to the portion of the broader project located on freehold land in NSW.

The NSW portion of the broader project has also been considered in an EPBC Act referral, as discussed in **Section 3.1.2.2**. This referral includes both the Commonwealth land and freehold land components of the NSW side of the project. The Action has been determined to be not a controlled action.

Table 3.3 Summary of Proposal Approval Requirements and Authorities

Approval	Authority	Documentation Required
EIS approval – PD Act	EPSDD	• Request for Scoping Document. • Draft EIS. • Revised EIS.
DA – new Planning ACT	EPSDD	• DA for assessable development (including significant development which requires an EIS).
Environmental protection agreement	EPA	• Construction Environment Management Plan (CEMP) and sub-plans. • Operational Environment Management Plan (EMP) and sub-plans.
Endorsement of Unanticipated Discovery Plan	ACT Heritage	• Unanticipated Discovery Plan.

3.2 Strategic Direction

In addition to the legislation discussed in **Section 3.1**, the following plans and policies have been considered in the preparation of this EIS.

3.2.1 National Capital Plan

The NCP aims to ensure that development within Canberra and the ACT generally occurs in a manner that is appropriate to its role as the nation's capital. It requires that developments be planned in accordance with national significance, recognising the unique purpose, setting, character and symbolism of Australia's national capital. The NCP provides a framework for development with regards to planning and design, while advancing the aspects of Canberra and the Territory that are important to the national role of Canberra. It also provides a framework for the Territory Plan, which provides more specific guidance on the development of the region (see **Section 3.2.2**).

In accordance with Section 10 of the PALM Act, the NCP sets out the broad planning principles and policies for Canberra and the Territory, as well as the detailed conditions of planning, design and development for designated areas which have particular importance to the special character of the national capital. Designated areas include Lake Burley Griffin and its foreshores, the National Triangle (bounded by the Kings, Commonwealth and Constitution Avenues), and the road reserves of the main avenues and approach routes into Canberra (e.g. Northbourne Avenue) (National Capital Authority, n.d.). Any buildings, structures, demolition, landscaping or excavation works proposed in designated areas require the prior written approval of the National Capital Authority.

The Proposal Area is not located within a designated area, so the Proposal would not require a Works Approval.

3.2.2 Territory Plan

The Territory Plan is the primary statutory document in the ACT. The purpose of the Territory Plan is to manage land use change and development in a manner consistent with the strategic directions provided by the ACT Government, the Legislative Assembly, and the community.

The *Territory Plan 2008* was repealed by the *Territory Plan 2023* on 27 November 2023. However, upon advice from the EPSDD, this EIS considers the *Territory Plan 2008* instead of the *Territory Plan 2023*, ensuring consistency with the Scoping Document as discussed in **Appendix C**. The DA to be submitted for the Proposal will be consistent with the *Territory Plan 2023*.

The *Territory Plan 2008* (the Territory Plan) includes a statement of strategic directions, a map which sets out zones and precincts within the ACT, objectives and development tables applying to each zone, and a series of general, development and precinct codes.

Land within the ACT is divided according to sections and blocks, which are zoned according to the type of development that is permissible on each block. The Proposal Area is classified as Territory Land and passes through several properties which are either subject to a private lease or managed by ACT Government entities such as PCS or TCCS.

The new alignments are located across non-urban land use zones (NUZ2, NUZ3 and NUZ4; see **Table 2.2** and **Figure 2.2**). The objectives of these zones are primarily to conserve the non-urban values of the land, notably the rural landscape of NUZ2, the hill system of NUZ3, and the river corridors in NUZ4, and to ensure land development is compatible with these values. Under the Territory Plan, the Proposal is categorised as a 'Major Service Conduit' (comprising transmission lines with a voltage greater than 66 kV), and is permissible with development approval in all three land use zones.

Removal of the existing lines does not represent changes to existing approved land uses, and are permissible in the relevant non-urban and urban land use zones impacted by these works. The stringing of additional conductors along Line 3C (subject to separate approvals) are also permissible.

As discussed in **Section 3.1.1.2**, the Proposal is subject to impact track assessment as it involves an activity or process specified in Schedule 4 of the PD Act and requires an EIS.

The eastern part of the Proposal Area (east of the Molonglo River) is also subject to the Belconnen, Coree and Stromlo District Precinct Codes, which contain additional assessable development and prohibited development on some parcels of land. Major Service Conduits are not prohibited on any specific land parcels in these districts, thus the codes are not relevant to this EIS. The policy and assessment outcomes of the relevant District Strategies under the *Territory Plan 2023* will be addressed in the Proposal's DA.

3.2.2.1 Territory Plan Strategic Directions

Section 2.1 of the Territory Plan provides a Statement of Strategic Directions, which sets out the principles for giving effect to the objects of the Territory Plan. The Statement includes principles for sustainable development as well as spatial planning and urban design principles that are intended to guide more specific policy content of the Territory Plan.

The design principles are intended to guide the planning and development of the ACT. They contain principles relating to sustainable development (economic, social and environmental sustainability), in addition to spatial planning and urban design principles which generally relate to the desired outcomes for future development of land and transport in the ACT.

The Proposal would meet all relevant strategic directions identified in Section 2.1 of the Territory Plan. The Proposal has also been developed with consideration for potential impacts on the environment, particularly in relation to ecological matters, heritage values, waterways, visual amenity and human safety

(principles 1.6, 1.7, 1.11, 1.25, 1.26, 2.8 and 2.13), and in accordance with the principles of ESD (principles 1.1–1.4, see **Section 3.3**). A full list of the Territory Plan strategic directions is provided in **Appendix H**, with cross-references to the applicable EIS sections provided in Table H.1.

3.2.3 ACT Planning Strategy 2018

The *ACT Planning Strategy 2018* is a key strategic planning document within the ACT, providing a framework for spatially based development decision making and identifying actions required to achieve its strategic goals over a 30-year period. The Strategy operates alongside the Territory Plan and the NCP, providing direction for land use and construction of capital works in the short, medium, and long term.

The urban planning framework is based on five themes that would deliver on a vision for a sustainable, competitive and equitable Canberra:

- Compact and efficient city.
- Diverse Canberra.
- Sustainable and resilient Territory.
- Liveable Canberra.
- Accessible Canberra.

The Proposal is particularly relevant to the first theme, to develop a compact and efficient city. This theme relates to growing mostly within our urban footprint or in areas close to our footprint and maintaining environmental values. The Proposal contributes to the theme by using infrastructure to support our growing community.

3.2.4 West Belconnen Strategic Assessment

The West Belconnen Strategic Assessment (WBSA) between the Commonwealth Government and Riverview Projects (ACT) Pty Ltd commenced in June 2014 under Part 10 of the EPBC Act to seek approval for the proposed development of a residential area and the West Belconnen Conservation Corridor, now referred to as Ginninderry. The WBSA was endorsed by the Commonwealth Minister for the Environment on 18 July 2017. Consideration has been given to the WBSA in this EIS as part of the Proposal is located in in the WBSA area (the lines to be removed). The new alignments do not overlap with the WBSA area.

Other strategic assessment areas are within the vicinity of the Proposal (Gungahlin and Molonglo), but do not overlap with the Proposal Area.

The Proposal is not an approved action in the WBSA. It is therefore not covered under the strategic assessment and requires assessment and approval as per usual PD Act processes.

3.2.5 Climate Change

As discussed in **Section 3.1.1.10**, the ACT is committed to net zero emissions by 2045. The ACT Climate Change Strategy 2019–25 (ACT Government, 2019a) details how the ACT will reduce its greenhouse gas emissions by 50–60% (from 1990 levels) by 2025. The Strategy has six key priorities, all of which are associated with a range of actions.

As a transmission line project, the Proposal would not directly contribute to meeting the Territory's greenhouse gas emission reduction targets, although it would ensure the continuity of a reliable electrical connection and supply of renewable energy to the ACT and broader NEM. As such, none of the priorities or actions are directly relevant to the Proposal.

However, the Proposal would provide additional land to be developed for residential housing within Ginninderry. Ginninderry is a 6-star Green Star community certified development which promotes and creates infrastructure, transport and buildings with reduced ecological footprints. It not only provides greenhouse gas emission reductions, but also assists with climate adaptation with increased energy resilience. On-site renewable energy generation, batteries and leadership in electrification have already provided significant benefits to the Territory. Ginninderry is now also looking to remove greenhouse gas emissions from transport, planned centres, commercial areas, schools and other facilities.

The Proposal would therefore indirectly support some of the actions in the 'energy, buildings and urban development' priority of the Strategy, and is not inconsistent with any of the priorities or actions.

3.2.6 Plans of Management

All nature reserves in the ACT require the preparation of a reserve management plan which identifies the values of the reserve, its management objectives, and the policies and actions for achieving those objectives.

The Proposal crosses over the Molonglo and Murrumbidgee Rivers, both of which are subject to reserve management plans. The Molonglo River Reserve – Reserve Management Plan covers land along the Molonglo River corridor between Scrivener Dam and the LMWQCC, including land beneath the new alignments. The Murrumbidgee River Corridor Plan of Management applies to most of the length of the Murrumbidgee River in the ACT, including the section from Pine Island (in Tuggeranong) to the ACT/NSW border, which includes land beneath the new alignments and the existing lines.

The Proposal is consistent with relevant objectives of both the Molonglo River Reserve – Reserve Management Plan and Murrumbidgee River Corridor Plan of Management, as described in **Table 3.4** and **Table 3.5**, respectively. In particular, the GJV's efforts to avoid and minimise biodiversity and heritage impacts has greatly reduced the impacts that the Proposal is likely to have on the reserves. Impacts would occur during construction of four new towers within the reserves, and during demolition of three existing towers from within the reserves.

Table 3.4 Relevant Objectives, Policies and Actions in the Molonglo River Reserve – Reserve Management Plan

Objective	Policy	Action	Proposal Response
Infrastructure, fire protection and operations			
16 – Avoid or minimise the impact on reserve values of building and maintaining infrastructure and facilities in or nearby the reserve	16.1 – The values, objectives and relevant policies of the plan will be used to guide advice and actions on the impacts of construction and maintenance works	16.1.1 – Provide advice to proponents of constructed works and facilities about how impact is to be mitigated.	The GJV has been engaging with PCS about the Proposal since 2021, to discuss the scope of the Proposal and potential impacts and benefits on PCS managed land (including land subject to the reserve management plans). This has provided the opportunity for PCS to provide advice to the GJV on how construction impacts are to be mitigated and managed to avoid and minimise impacts on reserve values.

Objective	Policy	Action	Proposal Response
Neighbours and communities			
20 – Achieve productive working relationships with neighbours that contribute to maintaining reserve values	20.1 – Establish and maintain good neighbour relationships.	20.1.1 – Promote co-operation and exchange of information about the management of the reserve with neighbours.	The GJV has been engaging with PCS about the Proposal since 2021, to discuss the scope of the Proposal and potential impacts and benefits on PCS managed land. The GJV has a positive relationship with PCS and will continue to work with PCS to ensure that the reserve values are maintained throughout Proposal construction and operation.

Table 3.5 Relevant Objectives in the Murrumbidgee River Corridor Plan of Management

Objective	Proposal Response
Management of heritage values	
4.1 – Management of water and channel values	The Proposal would not impact water and channel values of the Murrumbidgee River, including both ecological and social (recreational) values.
4.2 – Management of terrestrial natural resource values	The Proposal would not impact the riverine ecosystem or geological sites and landforms. Direct impacts within the Murrumbidgee River Corridor (due to tower construction) involve impacts on approximately 0.1 ha of potential PTWL habitat (moderate quality), 0.3 ha of potential perunga grasshopper habitat, and 0.3 ha of potential GSM habitat (low quality). The Proposal design has been subject to extensive reviews to minimise biodiversity impacts, and the above impacts are considered to be unavoidable.
4.3 – Management of cultural heritage	The Proposal would not impact any Aboriginal cultural heritage sites, and has been sited to avoid the confluence of the Murrumbidgee and Molonglo Rivers which is known to be of particular tangible and intangible value to First Nations people.
4.4 – Management of landscape values	The Proposal has been sited to minimise impacts on visual amenity and landscape character as much as possible. The new alignments would cross the Murrumbidgee River north of Uriarra Crossing where the conductors would be visible, which may adversely impact views from the picnic areas. The location of the towers adjacent to this span of the new alignments was chosen to minimise ecological and rural landholder impacts, and could not be microsited to completely avoid visual impacts at Uriarra Crossing.
Resource protection	
7.1 – Erosion control and rehabilitation	The Proposal will have a range of erosion and sediment control measures in place during construction, as described in **Section 6.5.1**. In addition, temporary construction areas will be rehabilitated. This will ensure that Proposal construction activities do not impact the reserve due to off-site erosion and sedimentation.
7.2 – Control of pest plants and animals	A range of a pest plant and animal control measures will be implemented during Proposal construction to minimise the risk of introducing and spreading weeds outside of the construction footprint. Refer to **Section 5.6.2** for further information.
Management of authorised activities	
8.2 – Utilities and services	This EIS describes the range of design changes that have been made to the Proposal to avoid and minimise adverse impacts (see **Section 2.4**). An extensive range of industry best practice mitigation and management measures will also be implemented to further minimise potential impacts, as summarised in **Chapter 19.0**.

Objective	Proposal Response
Management systems	
9.1 – Environmental planning and protection	This EIS describes the range of design changes that have been made to the Proposal to avoid and minimise adverse environmental and heritage impacts (see **Section 2.4**). An extensive range of industry best practice mitigation and management measures will also be implemented to further minimise potential impacts, as summarised in **Chapter 19.0**.

3.3 Ecologically Sustainable Development

Section 9 of the PD Act defines sustainable development in the following manner:

> *Sustainable development means the effective integration of social, economic and environmental considerations in decision-making processes, achievable through implementation of the following principles:*
>
> *a. the precautionary principle;*
>
> *b. the inter-generational equity principle;*
>
> *c. conservation of biological diversity and ecological integrity;*
>
> *d. appropriate valuation and pricing of environmental resources.*

ESD requires that current and future generations should live in an environment that is of the same or improved quality than the one that is inherited. To justify the Proposal with regard to ESD principles, the benefits of the Proposal in an environmental and socio-economic context should outweigh any negative impacts. Details on the consideration of each ESD principle, as defined under Section 9 of the PD Act, are provided below in relation to the Proposal.

3.3.1 The Precautionary Principle

In making decisions about developments, application of the precautionary principle is guided by careful evaluation to avoid, where practicable, serious or irreversible damage to the environment, and an assessment of the risk-weighted consequences of various options.

In order to achieve a level of scientific certainty in relation to potential impacts associated with the Proposal, this EIS has undertaken an evaluation of the main Proposal components, namely the new transmission lines, removal of existing transmission lines, and associated construction and operation activities. To ensure a precautionary approach, the stringing of additional conductors along Line 3C, which is subject to separate approvals, has also been considered to ensure facilitated impacts are captured. A detailed assessment of all key environmental issues and proposed management measures has been conducted and is documented in this EIS.

The assessment process has involved a detailed study of the existing environment and the use of engineering and scientific studies to assess potential impacts of the Proposal. To this end, there has been careful evaluation to avoid, where possible, serious or irreversible damage to the environment.

The decision-making process for the design, impact assessment and development of management measures for the Proposal has been transparent in the following respects:

- Relevant government authorities and community representatives have been consulted throughout development of the Proposal (see **Chapter 16.0**). This has provided the opportunity for the community and other stakeholders to comment on potential environmental and social impacts of the Proposal and the adequacy of proposed management measures.
- The risk-based approach underpinning this EIS has enabled the early identification of information gaps and risks to the broader environment, including social, economic and environmental factors. This has ensured that the Proposal has not been developed in an uninformed manner. The environmental assessments have then been undertaken on the basis of the best available scientific information for the Proposal Area. Where uncertainty in the data used in the assessments has been identified, conservative analyses have been undertaken and contingency measures have been identified to manage that uncertainty.
- All supporting technical reports are based on careful evaluation of the potential environmental impacts of the Proposal, using methods such as analysis of historic documentation and field surveys. Based on these assessments, mitigation and management measures have been formulated in accordance with best practice and relevant policies and guidelines to avoid serious or irreversible damage to the environment.

3.3.2 Intergenerational Equity

Intergenerational equity refers to equality between generations. It requires that the needs and requirements of today's generations do not compromise the needs and requirements of future generations in terms of health, biodiversity, and productivity.

The key objective of the Proposal is to move the existing transmission lines out of the West Belconnen FUA to increase the availability of housing in the area, particularly affordable housing. This would play an important role in ensuring the availability of housing to accommodate the ACT's growing population, for current and future generations. The transmission lines would be moved onto non-urban blocks where residential development is not permitted. The proposed location of the new alignments would therefore not constrain future residential development of the ACT.

Removal of the lines would also improve local amenity by reducing noise and visual impacts on residential areas, and would remove infrastructure from within the GCC, which was established under the WBSA, and from within other nature reserves such as the Woodstock Nature Reserve. This would allow for improved conservation outcomes and visual amenity in these areas.

The rural blocks on which the new alignments would be located have been extensively cleared for agricultural purposes, and many are still subject to grazing. These land uses would be able to continue without interruption once the Proposal is operational.

The Proposal therefore seeks to promote multiple uses of rural blocks in the new alignments, and to unlock beneficial residential uses along the lines to be removed, which would benefit future generations through the following mechanisms:

- Assist in providing continuous electricity supply to the region.

- Increase the availability of housing in western Belconnen and the ACT more generally, particularly affordable housing.
- Allow for current agricultural land uses to continue on land subject to the new alignments.
- Improve conservation outcomes and visual amenity in the GCC and adjacent nature reserve.

As detailed in **Chapter 5.0–Chapter 16.0**, the Proposal can effectively avoid or mitigate all potentially significant impacts. The environmental management measures have been developed to minimise the impact of the Proposal on the environment and community to the extent reasonably practicable, to maintain the health, diversity and productivity of the environment for future generations whilst also realising the benefits of moving the existing transmission lines out of the West Belconnen FUA onto nearby farmland.

3.3.3 Conservation and Biological Diversity

The conservation of biological diversity and ecological integrity refers to the maintenance of species richness, ecosystem diversity and health and the links and processes between them.

The Proposal Area supports a variety of environmental conditions. The western extent of the Proposal Area is agricultural land, dominated by exotic grassland, with areas of woodland persisting within the river corridors. While the eastern extent of the Proposal Area has also been managed for rural land uses, it contains larger areas of native grassland and woodland along the road verges.

The Proposal Area contains fauna habitat for both common and threatened species, including outcroppings of loose surface rock, hollow-bearing trees, and patches of regenerating woodland and native grasslands (both derived and otherwise). Rocky areas provide habitat for some reptile species, such as PTWL, and hollow-bearing trees may provide habitat and foraging resources for hollow-dependant fauna species.

The Proposal has been explicitly designed following the principles of the mitigation hierarchy, with the aim of avoiding ecological impacts wherever possible. The ability to position transmission towers within the landscape to achieve fine scale avoidance of impacts has resulted in the majority of impacts being avoided, with small impacts remaining on native vegetation, hollow-bearing trees, and rocky habitat. Rehabilitation of disturbed areas has also been included as part of the environmental management commitments of the Proposal. In addition, the net reduction in transmission infrastructure within conservation areas would reduce ongoing impacts associated with maintenance and allow for improved management and rehabilitation of conservation areas.

These design decisions will contribute to the conservation of biological diversity and ecological integrity within the Proposal Area and surrounding landscape.

3.3.4 Valuation and Pricing Resources

The goal of improved valuation of natural capital has been included in Agenda 21 of Australia's Intergovernmental Agreement on the Environment (Council of Australian Governments, 1997).
The principle of improved valuation and pricing refers to the need to determine proper values of services provided by the natural environment. The objective is to apply economic terms and values to the elements of the natural environment. This is a difficult task largely due to the intangible comparisons that need to be drawn in order to apply the values.

A cost-benefit analysis was undertaken by the CIE to identify potential adverse and beneficial impacts of the Proposal and apply a cost to those impacts to allow for an economic comparison of impacts (see **Appendix G8**). Impacts were identified in relation to the GJV as well as other parties such as landholders and public land users. As shown in **Table 3.6**, the Proposal is estimated to have a net beneficial impact of approximately $70 million in net present value (assuming a 50-year life of the Proposal and a discount rate of 7%). This involves a net benefit to the GJV, as the costs of relocating the transmission line and developing the new land would be outweighed by the revenue gained by selling the new land parcels.

There would also be a small net benefit to other parties, as the landscape amenity impacts of the new alignments would be outweighed by the increased availability of housing, particularly community and affordable housing, as well as a small net increase in conservation land that does not support transmission infrastructure, and small decrease in the maintenance work needed for the transmission lines.

Table 3.6 Estimated Cost of Adverse and Beneficial Impacts of the Proposal

Potential Impacts	Estimated Cost of Impacts (net present value, $ million) *A positive cost is a beneficial impact and a negative cost is an adverse impact*
Net impact on the GJV	**+65.09**
Value of additional land parcels able to be sold	+174.67
Land production costs	–53.36
Transmission line realignment costs	–71.54
Value uplift on properties located near the transmission lines to be removed	+15.31
Net impact on other parties	**+5.06**
Landscape amenity impacts	+3.85
Environmental impacts	+1.13
Heritage impacts	0
Impacts associated with transmission line maintenance	+0.07
Net impact of the Proposal	**+70.14**

4.0 Risk Assessment Approach

Chapter Summary

This chapter describes the environmental risk assessment process undertaken for this EIS. The results of the risk assessment form the basis of the impact assessments undertaken for each environmental issue, as set out in **Chapter 5.0–Chapter 16.0**.

This environmental risk assessment is a requirement of the EIS Scoping Document Application (see **Appendix A**) and is an important step in assessing the Proposal's potential environmental impacts. The risk assessment assists in identifying issues that are of greater concern than others and which require more comprehensive consideration in the EIS. This helps to develop appropriate mitigation measures and management responses and to determine potential residual risks.

4.1 Risk Assessment Methodology

The environmental risk assessment for the Proposal has been undertaken with consideration of *AS/ISO 31000:2018 Risk management – Guidelines*. This standard provides a set of guidelines for managing risk faced by organisations and can be used to manage any type of risk in any industry or sector (ISO, 2018).

For the purposes of this EIS, the risk of an impact has been classified according to categories that describe the likelihood of an impact occurring and its consequences, as per the matrix provided in **Table 4.1**. The pre-mitigated risk was therefore assessed as a function of the likelihood of the risk occurring and the consequences associated with the risk occurring.

Section 4.1.1 and **Section 4.1.2** provide the likelihood and consequence ratings used in this EIS which have been developed with consideration of the *Proponent's Guide to Environmental Impact Statements* (ACT Government, 2017b). The EIS Scoping Document defines a potentially significant risk as a risk with a medium risk level or above.

Following the identification of measures of mitigating and/or managing risk, the residual (mitigated) risk was then assessed based on the effectiveness of the control systems in place to address the risk using the same likelihood and consequence rating provided in **Table 4.1**.

Where risks have been evaluated to be as low as reasonably practicable (ALARP), this has been indicated in the preliminary and residual risk assessment tables in **Chapter 5.0–Chapter 16.0**. The risk ratings of these risks cannot practicably be lowered further. Both unmitigated and residual risks may be ALARP.

Chapter 18.0 provides the residual risk assessments for all risks associated with the Proposal.

Table 4.1 Risk Assessment Matrix

		Consequence				
		Minimal	**Minor**	**Moderate**	**Major**	**Catastrophic**
Likelihood	**Remote**	Negligible	Negligible	Very low	Low	Medium
	Unlikely	Negligible	Very low	Low	Medium	High
	Possible	Very low	Low	Medium	High	Very high
	Likely	Low	Medium	High	Very high	Significant
	Almost certain	Medium	High	Very high	Significant	Significant

4.1.1 Likelihood

The likelihood of an impact occurring is best described in terms of probability, and in this case, probability assessed through qualitative assessment. There is a need to recognise there may be uncertainty associated with assessing potential impacts, particularly during the concept design stage of a project. Where there is scientific uncertainty, best practice dictates that a precautionary approach should be used, which would lead to the identification of a more conservative or higher level of risk. **Table 4.2** shows the criteria used to determine the likelihood of an impact occurring as a result of the Proposal.

Table 4.2 Likelihood Categories

Likelihood	Description	Probability	Community attitude
Remote	May occur in exceptional circumstances	<1%	Few people interested
Unlikely	Not expected to occur in most circumstances	1–20%	Some people affected
Possible	May occur	21–49%	Many people affected
Likely	Probably will occur	50–85%	Most people affected
Almost certain	Expected to occur	>85%	Almost everyone affected

4.1.2 Consequence

The likely consequence of an impact requires a degree of subjective assessment, as the consequence could consist of multiple elements, several of which may be interrelated, e.g. a consequence is considered to be major if any one of its elements is predicted to have a major impact. Common elements of potential consequences are provided in **Table 4.3**.

The consequence of an impact used within the risk assessment needs to be reasonably foreseeable. As with the likelihood categories, a precautionary approach has been adopted if there is a large degree of uncertainty in the consequence of an impact, which means that the consequence rating is more conservative or more severe than might eventuate.

Table 4.3 Elements of Consequences

Element	Consequence				
	Minimal	**Minor**	**Moderate**	**Major**	**Catastrophic**
Community consequence	Negligible complaints or concerns	Public concern limited to local complaints	Local public or media attention and complaints	Attention from media or heightened concern from community	Adverse national media or public attention
	People largely unaffected	Temporary and localised effects on people's livelihoods	Widespread and temporary, or localised and permanent effects on people's livelihoods	Widespread and temporary, or localised and permanent effects on livelihood and/or displacement of people	Entire villages, communities or groups are displaced, and livelihoods are affected
Environmental consequence	Impacts such as localised or short-term effects on habitat, species or environmental attributes	On-site release with minor environmental impacts	On-site release with some detrimental effects	Resulting in off-site release and some detrimental effects	Resulting in permanent off-site detrimental effect
	Negligible environmental impacts	Localised, long-term degradation of sensitive habitat, species or environmental attributes	Localised and irreversible habitat damage or loss of habitat, species or environmental attributes	Widespread and persistent changes to habitat, individual species or environmental attributes	Loss of a significant portion of a valued species or loss of effective ecosystem function on a widespread scale
Health/safety consequence	No detectable change	Some minor detectable change	Change requiring basic treatment or medical attention	Change resulting in medical treatment and hospitalisation	Significant/life threatening change
	No injuries	First aid treatment	Medical treatment, lost time injuries, plant damage	Extensive injuries, plant damage	Multiple deaths, permanent significant injury
Economic consequence	Minimal losses	Several thousand dollars of lost revenue or remediation costs	Half a million dollars in lost revenue or remediation costs	One million dollars in lost revenue or remediation costs	Several million dollars in lost revenue or remediation cost

4.2 Proposal Risk Assessment

Section 4.1 provides the likelihood and consequence ratings for the risk assessment used in this EIS. The Proposal risk assessment in **Table 4.4** includes risks identified in the preliminary risk assessment (PRA) undertaken for the Proposal's Scoping Document application and additional risks identified throughout the EIS process. This risk assessment presents the risk ratings prior to the consideration of mitigation and management measures.

The impact assessments in **Chapter 5.0–Chapter 16.0** focus on specific matters identified in the risk assessment. They include a discussion of mitigation and management measures to be implemented during all phases of the Proposal and whether there is a need to further mitigate or compensate for any potential residual risk.

Table 4.4 Upper and Lower Tumut 330 kV Transmission Line Realignment Pre-mitigation Risk Assessment

Activity/Area of Impact	ID	Risk Scenario	Likelihood	Consequence	Risk Rating
Design					
Approvals	A1	Potential environmental impacts are unacceptable and approval is not granted.	Remote	Major	Low
	A2	Risks are not adequately identified for the Proposal, resulting in an incomplete understanding of potential environmental impacts and constraints.	Possible	Moderate	Medium
	A3	Delays in approval decisions result in delayed service delivery and financial implications for the Proposal.	Possible	Major	High
Biodiversity	B1	The location of the Proposal leads to unavoidable removal of threatened ecological communities and/or threatened species habitat.	Almost Certain	Moderate	Very high
	B2	Presence or extent of threatened species habitat or ecological communities or other protected matters (e.g. native vegetation) is not identified prior to the design being finalised, resulting in unanticipated impacts.	Unlikely	Moderate	Low
	B3	Cumulative biodiversity impacts occur as a result of the Proposal and other developments in the region.	Possible	Moderate	Medium
	B4	If required, an appropriate offset site is unable to be identified or established in the ACT.	Unlikely	Major	Medium
Compliance	C1	The Proposal is non-compliant with secondary ACT legislation such as the *Environment Protection Act 1997* (EP Act).	Unlikely	Moderate	Low
Heritage	H1	The location of the Proposal results in adverse impacts on the heritage values of European heritage places.	Remote	Moderate	Very low
Landscape and visual	L1	The location of the Proposal results in a loss of visual amenity for local residents and users of the surrounding area and impacts on landscape character.	Possible	Moderate	Medium
	L2	Cumulative visual impacts occur as a result of the Proposal and other developments in the region.	Possible	Moderate	Medium
Planning and land status	LU1	Proposal is not consistent with land use zoning for the area.	Remote	Moderate	Very low
	LU2	The location of the Proposal limits future land uses and management activities, hindering future development and use of surrounding land.	Unlikely	Moderate	Low
Socio-economic	SE1	Unanticipated public concerns or comments received during the EIS process results in rework, delays or public animosity.	Possible	Moderate	Medium
	SE2	Siting of the Proposal results in a loss of agricultural land.	Unlikely	Minimal	Negligible

Activity/Area of Impact	ID	Risk Scenario	Likelihood	Consequence	Risk Rating
	SE3	Impacts on human health and safety from exposure to electromagnetic fields (EMF) and frequencies associated with high voltage powerlines.	Unlikely	Major	Medium
Construction					
Biodiversity	B5	The area of disturbance exceeds the area assessed and approved, resulting in non-compliance with the PD Act/Planning Act approvals (and/or EPBC Act if relevant).	Possible	Moderate	Medium
	B6	Clearing of a threatened ecological community and/or threatened species habitat leads to a loss of biodiversity in the region.	Possible	Moderate	Medium
	B7	Construction activities injure or kill threatened fauna.	Possible	Moderate	Medium
	B8	Clearing of native vegetation results in a loss of connectivity or increased fragmentation in the landscape, and/or obstruction of local movement corridors for threatened fauna.	Likely	Moderate	High
	B9	Land disturbance during construction results in the spread of invasive species off-site.	Possible	Moderate	Medium
	B10	Noise, vibration, lighting, dust, waste, and erosion and sedimentation cause impacts on threatened species.	Possible	Minor	Low
	B11	Cumulative biodiversity impacts occur as a result of the Proposal construction and other developments in the region.	Possible	Moderate	Medium
	B12	Construction of access tracks results in connectivity barriers, and/or obstruction of movement corridors for fauna	Unlikely	Minor	Very Low
	B13	Demolition of existing towers results in biodiversity impacts in rural areas and nature reserves	Unlikely	Moderate	Low
Compliance	C2	Construction activities result in environmental impacts that are not reported or otherwise acted upon adequately.	Possible	Moderate	Medium
	C3	The CEMP, including monitoring and auditing requirements, is not properly implemented, leading to various environmental, social, and economic impacts and non-compliance with approval conditions.	Possible	Moderate	Medium
Air quality	CC1	Construction activities result in impacts on air quality (e.g. from vehicle and dust emissions), reducing local amenity and potentially resulting in community complaints and non-compliance with the EP Act.	Possible	Minor	Low
	CC2	Cumulative air quality impacts occur as a result of Proposal construction activities and other developments in the region.	Possible	Moderate	Medium

Activity/Area of Impact	ID	Risk Scenario	Likelihood	Consequence	Risk Rating
Climate change	CC3	Opportunities to minimise greenhouse gas emissions during procurement and construction of the Proposal are not considered, leading to a greater contribution to climate change from the Proposal.	Possible	Minimal	Very low
Heritage	H2	Construction activities result in the destruction or damage of Aboriginal cultural heritage items.	Unlikely	Major	Medium
	H3	Construction activities result in destruction or damage of European heritage places.	Unlikely	Moderate	Low
Bushfire	HR1	Sparks from construction machinery, vehicles or electrical works start a fire, resulting in fire spreading into the surrounding landscape.	Possible	Catastrophic	Very high
Safety	HR2	Unapproved access to site leads to injury or death through contact with electrical equipment.	Unlikely	Catastrophic	High
	HR3	Working with high voltage infrastructure places construction workers at risk of injury or death.	Possible	Catastrophic	Very high
Utilities	HR4	Construction activities result in unintended damage to existing utilities and other essential infrastructure.	Unlikely	Major	Medium
Landscape and Visual	L3	Vegetation clearance results in a loss of visual amenity for local residents and impacts on landscape character.	Unlikely	Minor	Very low
	L4	Construction of the Proposal results in a loss of visual amenity for local residents and users of the surrounding area and impacts on landscape character.	Possible	Minor	Low
	L5	Cumulative visual impacts occur as a result of the Proposal and other developments in the region.	Possible	Moderate	Medium
Materials and waste	M1	Waste materials produced during construction of the Proposal are not stored or managed such that environmental risks are minimised.	Possible	Minor	Low
	M2	Excessive amounts of resources used during Proposal construction lead to high volumes of waste to be disposed of.	Unlikely	Minor	Very low
Noise and vibration	N1	Proposal construction activities lead to an increase in noise levels in the surrounding area which reduces local amenity, potentially impacting nearby people and resulting in community complaints and/or non-compliance with the EP Act.	Likely	Moderate	High
	N2	Proposal construction activities lead to off-site vibration which reduces local amenity, potentially impacting nearby people and resulting in damage to nearby structures.	Possible	Moderate	Medium
	N3	Cumulative noise and vibration impacts occur as a result of Proposal construction and other developments in the region.	Likely	Moderate	High
Soils and geology	S1	Construction activities such as vegetation clearance and civil works increase erosion and sedimentation, leading to soil degradation.	Likely	Moderate	High

Activity/Area of Impact	ID	Risk Scenario	Likelihood	Consequence	Risk Rating
	S2	Fuel or chemical spills, or disturbance of existing contaminated material, lead to soil contamination which could result in environmental degradation and fines under the EP Act.	Unlikely	Moderate	Low
Socio-economic	SE4	People in areas near the Proposal are exposed to increased levels of noise, vibration, dust emissions, lighting and/or traffic from construction activities, reducing local amenity and potentially resulting in community complaints, non-compliance with the EP Act and/or safety issues.	Possible	Catastrophic	Very high
Traffic and Transport	T1	Increased volumes of construction and demolition traffic on local roads, construction of Proposal access tracks, and stringing/destringing of conductors over public roads result in traffic disruptions to residents and other road users, or damage to road surfaces.	Possible	Minor	Low
	T2	Temporary traffic management measures implemented during construction and demolition are not suitable and result in near miss incidents, crashes, injuries or death.	Unlikely	Catastrophic	High
	T3	Uncontrolled access by construction and demolition vehicles leads to dispersal of litter or other pollutants, damage to habitats or areas to be retained, and spread of weeds within the Proposal Area and/or areas outside the Proposal Area.	Possible	Moderate	Medium
	T4	Construction of access tracks results in unanticipated vegetation clearance.	Possible	Moderate	Medium
	T5	Cumulative traffic congestion impacts occur as a result of the Proposal and other developments in the region.	Possible	Minor	Low
Hydrology and Water Quality	W1	Earthwork activities generate soil that increases sedimentation of nearby waterways when transported off site.	Possible	Major	High
	W2	Fuel or chemical spills, or disturbance of existing contaminated material, lead to contamination of groundwater and/or nearby waterways, which could result in environmental degradation and fines under the EP Act.	Unlikely	Moderate	Low
	W3	Any groundwater dewatering required is discharged directly or indirectly to surface waterbodies, impacting the water quality of the receiving waters.	Unlikely	Moderate	Low
	W4	Any groundwater dewatering required results in localised changes to groundwater levels.	Unlikely	Minor	Very low
	W5	Water generated during fire suppressing activities resulting from construction activities, results in run-off, and potential environmental degradation.	Possible	Moderate	Medium
Operation					
Biodiversity	B14	Proposal Area becomes infested with weeds, leading to an increased risk to off-site areas.	Possible	Moderate	Medium

Activity/Area of Impact	ID	Risk Scenario	Likelihood	Consequence	Risk Rating
	B15	Non-compliance with the Offset Management Plan (if required) and/or approval conditions, inadequate management of offset site, or failure of offset site leads to Proposal financial and reputational issues, and environmental losses.	Possible	Major	High
	B16	Operation of the transmission lines results in line collision by birds, particularly over river crossings	Possible	Minor	Low
	B17	Operational maintenance of new towers results in impacts to avoided areas of environmental sensitivity	Possible	Moderate	Medium
Bushfire	HR5	Sparks from maintenance machinery, vehicles or electrical works start a fire, resulting in fire spreading into the surrounding landscape.	Possible	Catastrophic	Very high
Compliance	C4	The Proposal is non-compliant with approval management conditions.	Possible	Moderate	Medium
Heritage	H4	Once operational, the Proposal results in adverse impacts on the heritage values of European heritage places.	Remote	Moderate	Very low
Safety	HR6	Unapproved access to site leads to injury or death through contact with electrical equipment.	Remote	Catastrophic	Medium
	HR7	Maintenance of Proposal components is not undertaken appropriately or effectively over the life of the Proposal, resulting in increased bushfire risk to the surrounding landscape and/or the system not operating as designed.	Unlikely	Moderate	Low
	HR8	Impacts on human health and safety from exposure to electromagnetic fields (EMF) and frequencies associated with high voltage powerlines.	Unlikely	Major	Medium
	HR9	Aircraft operating in the vicinity of the Proposal collide with the new transmission lines.	Unlikely	Catastrophic	High
Landscape and visual	L6	Once operational, the Proposal results in a loss of visual amenity for local residents and users of the surrounding area and impacts on landscape character.	Likely	Moderate	High
	L7	Cumulative visual impacts occur as a result of operation of the Proposal and other developments in the region.	Possible	Moderate	Medium
Noise and vibration	N4	Once operational, noise from the Proposal (caused by corona discharge) reduces local amenity, potentially impacting nearby people and resulting in community complaints and/or non-compliance with the EP Act.	Possible	Minor	Low
	N5	Cumulative noise impacts occur as a result of operation of the Proposal and other developments in the region.	Possible	Minor	Low

Activity/Area of Impact	ID	Risk Scenario	Likelihood	Consequence	Risk Rating
Socio-economic	SE5	Residents or landholders near the new alignments raise unanticipated or additional concerns to those raised during consultation in the development process, resulting in community complaints, public animosity and/or reputational risks.	Possible	Moderate	Medium
	SE6	People in areas near the Proposal are exposed to increased levels of noise and reduced visual amenity once the Proposal is operational, reducing local amenity and potentially resulting in community complaints and non-compliance with the EP Act.	Likely	Moderate	High
Traffic and Transport	T6	Increased volumes of maintenance traffic on local roads result in traffic disruptions to residents and other road users.	Remote	Minimal	Negligible
Various	HR8	Maintenance of Proposal components is not undertaken appropriately or effectively over the life of the Proposal, resulting in increased bushfire risk to the surrounding landscape and/or the system not operating as designed.	Unlikely	Moderate	Low

5.0 Biodiversity

Chapter Summary
This chapter details the presence and extent of ecological values in the Proposal Area, including native vegetation, threatened ecological communities and threatened species habitat. It provides an assessment of potential impacts on these ecological values and a range of measures that will be implemented to mitigate, manage and offset the impacts.

5.1 Preliminary Risk Assessment

An assessment of potential risks of the Proposal associated with biodiversity is provided in **Table 5.1**. The risk ratings range from low to very high, with significant impacts possible from activities that involve vegetation clearance, which pose a mortality risk to fauna, and from indirect impacts such as spread of invasive weeds. Significant impacts could also occur in relation to identification and implementation of offsets.

Section 5.2 to **Section 5.3.6** provide a detailed assessment of these risks. The residual risk assessment in **Section 5.7** provides revised ratings for each risk based on the mitigation and management measures described in **Section 5.5**.

Table 5.1 Preliminary Assessment of Risks Associated with Biodiversity

ID	Risk Scenario	Preliminary Risk Assessment			
		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Design					
B1	The location of the Proposal leads to unavoidable removal of threatened ecological communities and/or threatened species habitat.	Almost certain	Moderate	Very high	Yes
B2	Presence or extent of threatened species habitat or ecological communities or other protected matters (e.g. native vegetation) is not identified prior to the design being finalised, resulting in unanticipated impacts.	Unlikely	Moderate	Low	No
B3	Cumulative biodiversity impacts occur as a result of the Proposal and other developments in the region.	Possible	Moderate	Medium	Yes
B4	If required, an appropriate offset site is unable to be identified or established in the ACT.	Unlikely	Major	Medium	No
Construction					
B5	The area of disturbance exceeds the area assessed and approved, resulting in non-compliance with the PD Act/Planning Act approvals (and/or EPBC Act if relevant).	Possible	Moderate	Medium	No

ID	Risk Scenario	Preliminary Risk Assessment			
		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
B6	Clearing of a threatened ecological community and/or threatened species habitat leads to a loss of biodiversity in the region.	Possible	Moderate	Medium	No
B7	Construction activities injure or kill threatened fauna.	Possible	Moderate	Medium	No
B8	Clearing of native vegetation results in a loss of connectivity or increased fragmentation in the landscape, and/or obstruction of local movement corridors for threatened fauna.	Likely	Moderate	High	No
B9	Land disturbance during construction results in the spread of invasive species off-site.	Possible	Moderate	Medium	No
B10	Noise, vibration, lighting, dust, waste, and erosion and sedimentation cause impacts on threatened species.	Possible	Minor	Low	No
B11	Cumulative biodiversity impacts occur as a result of the Proposal construction and other developments in the region.	Possible	Moderate	Medium	Yes
B12	Construction of access tracks results in connectivity barriers, and/or obstruction of movement corridors for fauna.	Unlikely	Minor	Very Low	Yes
B13	Demolition of existing towers results in biodiversity impacts in rural areas and nature reserves	Unlikely	Moderate	Low	No
Operation					
B14	Proposal Area becomes infested with weeds, leading to an increased risk to off-site areas.	Possible	Moderate	Medium	No
B15	Non-compliance with the Offset Management Plan (if required) and/or approval conditions, inadequate management of offset site, or failure of offset site leads to Proposal financial and reputational issues, and environmental losses.	Possible	Major	High	No
B16	Operation of the transmission lines results in line collision by birds, particularly over river crossings	Possible	Minor	Low	No
B17	Operational maintenance of new towers results in impacts to avoided areas of environmental sensitivity.	Possible	Moderate	Medium	No

5.2 Investigations

A Biodiversity Assessment Report (BAR) was prepared by Umwelt (2024) to assess potential biodiversity impacts of the Proposal. The BAR assessed areas of direct impacts in the Proposal Area and considered indirect impacts on adjacent areas in the Proposal Area and broader landscape. Various iterations of the Proposal Area have been assessed over several years to inform siting options and identify areas of high ecological importance to be avoided. All surveys were undertaken in accordance with relevant Commonwealth and/or ACT survey guidelines where available, as described in **Table 5.3** and **Table 5.4**.

The BAR involved a desktop review of a range of publicly available information using the data sources listed in **Table 5.2** and **Appendix E**. The date, reliability and any uncertainties for each of these data sources have been provided in accordance with the Scoping Document (see **Appendix A**). The reliability and uncertainties are presented in the context for which the data have been used in this EIS (i.e. providing regional context, or site-specific information).

Table 5.2 Data Sources Reviewed in the BAR

Data Source	Description	Context for Use	Reliability	Uncertainties
EPBC Act Protected Matters Search Tool	Identifies MNES that may occur in the Proposal Area (refer to **Section 3.1.2.2** for more information on MNES and the EPBC Act).	Regional presence / absence	High	None
Species Profile and Threats Database (SPRAT)	Provides the legal status and guidance documents for threatened species and ecological communities listed under the EPBC Act, including approved conservation advices, recovery plans and other best practice guidelines.	General habitat descriptions / species information	High	None
ACTmapi	The Act Government's mapping tool. Identifies matters protected under Territory legislation that may occur in the Proposal Area, including threatened species, ecological communities and registered trees.	Local presence / absence	High	None
Canberra Nature Map (NatureMapr)	Identifies matters protected under Commonwealth and / or Territory legislation that may occur in the Proposal Area.	Regional presence / absence	Medium-high	Sightings of flora and fauna can be added to the database by anyone, but all data are verified by experts.
Atlas of Living Australia (ALA)	A digital tool that compiles Australian biodiversity data from multiple sources, making it accessible and reusable. Provides records for threatened and non-threatened species.	Regional presence / absence	Medium-high	Pulls together data from multiple sources including databases which anyone can add data to, such as Canberra Nature Map. Data can also be uploaded directly to ALA by anyone.
eBird	A global online database of bird records that documents bird distribution, abundance, habitat use and trends through checklist data entered by bird watchers. Provides data for threatened and non-threatened bird species.	Regional presence / absence	Medium	Bird sightings can be added to the database by anyone. Regional experts will review the records of unusual birds or high counts.
ACT Government golden sun moth modelling	Modelling of golden sun moth habitat extent provided by the Conservator. Not yet publicly available.	Identifying areas for golden sun moth surveys	Medium-high	The Conservator's team has noted that the modelling is quite new and not yet ready for public distribution, but that test statistics have revealed that the predictive power of the models is strong. However, as they are only models, they do require field verification.

Field surveys were conducted in 2021 (December), 2022 (November and December), and 2023 (February, August and October) to identify all native vegetation in the construction footprint and vegetation clearance zone (collectively referred to as the 'Direct Impact Area'), and to map vegetation communities and condition zones in accordance with the ACT Plant Community Type (PCT) classification system.

As detailed in **Table 5.3**, habitat was also mapped for a range of threatened species, including superb parrot (*Polytelis swainsonii*), gang-gang cockatoo (*Callocephalon fimbriatum*), pink-tailed worm-lizard (*Aprasia parapulchella*) (PTWL), golden sun moth (*Synemon plana*) (GSM), and perunga grasshopper (*Perunga ochracea*). Habitat was not mapped for little eagle (*Hieraaetus morphnoides*), rainbow bee-eater (*Merops ornatus*) or white-throated needletail (*Hirundapus caudacutus*), as habitat for these species is likely to occur across the entire Proposal Area and a habitat assessment would not be informative to this EIS.

Targeted surveys were undertaken for superb parrot, gang-gang cockatoo, GSM, hoary sunray (*Leucochrysum albicans*), small purple-pea (*Swainsona recta*) and austral toadflax (*Thesium austral*) (see **Table 5.4**). Targeted surveys were not conducted for PTWL as the species is known to occur throughout the Molonglo and Murrumbidgee River corridors in this area. Targeted surveys were also not undertaken for perunga grasshopper as the species is cryptic and there are no survey guidelines for the species. Presence has been assumed for both PTWL and perunga grasshopper in areas of mapped habitat.

Table 5.3 Details of Habitat Mapping for Threatened Species and Ecological Communities

Threatened Species / Community	Mapping Details	Relevant Guidelines
Box gum woodland and natural temperate grassland	• Native vegetation was mapped in grasslands within the Direct Impact Area using a step point transect to differentiate between native and exotic dominated groundcover. • Vegetation type and condition was assessed through collection of rapid assessment points recording dominant species in each stratum and vegetation floristic plots. • Vegetation units were mapped as per the ACT PCT classification system. • Areas of box gum woodland and natural temperate grassland were identified based on areas of mapped PCTs which conformed with the EPBC Act TEC listing criteria.	• Approved Conservation Advice for the White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (DCCEEW, 2023a) • Approved Conservation Advice (including listing advice) for the Natural Temperate Grassland of the South Eastern Highlands *(EC 152)* (TSSC, 2016a).
Superb parrot	• Trees assessed to have a >50% likelihood of being suitable for superb parrot nesting were mapped in the new alignment corridors November 2022 and October 2023. Nesting tree criteria were provided by the Conservator's office in the Scoping Document as follows: o Tree species is scribbly gum (*Eucalyptus rossii*) or Blakely's red gum (*E. blakelyi*). o Trunk diameter at breast height >70 cm. o Tree has more than nine tree hollows (with entrance size >4 cm) which are visible from the ground. • Height of trees was also assessed as requested by the Conservator's office, as trees 10–15 m in height have been found to support superb parrot movements. • The surveys for superb parrot nesting trees and movement trees were undertaken in an area referred to as the 'superb parrot tree assessment area' as per advice from the Conservator's office (see **Figure 5.2**).	• Criteria for nesting trees and movement trees were provided by the Conservator's office.
Gang-gang cockatoo	• Trees suitable for gang-gang cockatoo breeding and foraging were mapped in the new alignment corridors in November 2022 and October 2023 o Breeding habitat was identified based on research from Davey and Mulvaney (2020), i.e. hollow-bearing trees containing preferred hollows with an average entrance width of 13.1 cm (range 9–24 cm) and average height above ground of 7.5 m (range 5–9.4 m). o Foraging habitat includes woodlands with *Eucalyptus* and *Acacia* species.	• Report on a survey of breeding activity of the gang-gang cockatoo within urban Canberra 2019–2020 (Davey & Mulvaney, 2020). • Internal research from the ACT Government (not publicly available).

Threatened Species / Community	Mapping Details	Relevant Guidelines
	• The ACT Government is currently undertaking research into suitable breeding habitat for gang-gang cockatoo. In April-May 2024, an ecologist from the ACT Government investigated the potential nesting trees identified by Umwelt in 2022 and 2023 to confirm whether they met the current nesting tree criteria, based on a ground survey. In July 2024, the same ecologist and an independent arborist surveyed the potentially suitable trees to confirm with certainty whether they met the current criteria, by measuring hollow dimensions. The trees identified through this process were used in the impact assessment in **Section 5.4.4**.	
PTWL	• Desktop habitat mapping (rocky areas) was completed in January 2023 using aerial imagery from October 2019. • Vegetation mapping was overlayed onto mapped habitat in the consutrction footprint to produce preliminary condition zones. • Mapped condition zones were confirmed on-ground between 7 and 9 August 2023 and re-classified as required.	• PTWL habitat condition categories were obtained from Confirmatory surveys for pink-tailed worm lizards (*Aprasia parapulchella*) and additional mapping of habitat along the Molonglo River corridor between Coppins Crossing and Tuggeranong Parkway (Osborne, 2010).
GSM	• Potential habitat was confirmed on-ground where GSM habitat was modelled by the Conservator's office (**Figure 5.8** and **Figure 5.11**) overlaps with the construction footprint, using the (SMEC & Rowell, 2018) classification criteria for GSM habitat.	• Yass Valley lot 2 offset golden sun moth population monitoring and habitat assessment 2017 (SMEC & Rowell, 2018).
Perunga grasshopper	• Areas of native grassland (including derived grasslands) dominated by wallaby grasses (*Rytidosperma* spp.), speargrass (*Austrostipa* sp.) or kangaroo grass (*Themeda triandra*) in the construction footprint were considered potential habitat for perunga grasshopper. This information was gathered during the vegetation mapping.	• Perunga grasshopper *(Perunga ochracea)* action plan (ACT Government, 2017a).

Table 5.4 Details of Targeted Surveys for Threatened Flora and Fauna Species

Threatened Species	Survey Details	Relevant Survey Guidelines
Hoary sunray and small purple-pea	• Targeted surveys were completed on 18–19 October 2023 throughout the construction footprint. • Surveys consisted of walked parallel field transects with approximately 10 m separation width.	Surveying threatened plants and their habitats: NSW survey guide for the Biodiversity Assessment Method (DPIE, 2020)
Austral toadflax	• Targeted surveys were completed on 13 February and 18–19 October 2023 across the construction footprint, with a focus on patches supporting a higher quality understorey. • The October 2023 surveys were undertaken as per a request from the Conservator's office to improve detection rates. • Surveys consisted of walked parallel field transects with approximately 10 m separation.	Surveying threatened plants and their habitats: NSW survey guide for the Biodiversity Assessment Method (DPIE, 2020)
Superb parrot	• Surveys were conducted across four days in November and December 2022 at locations with confirmed potential nesting trees in the new alignment corridors. • Surveys were conducted across three time periods (9–11 am, 12–1 pm and 4–6 pm) comprising 36 x 20 minute / 2 ha surveys.	Survey guidelines for Australia's threatened birds (DEWHA, 2010)
Gang-gang cockatoo	• Survey time and effort were based on the superb parrot survey guidelines (see above).	-
GSM	• Targeted surveys were undertaken in an older alignment corridor over six days in December 2021 to confirm the presence/absence of GSM. • Additional targeted surveys were undertaken in the final construction footprint over four days in November 2023, in areas of potential habitat identified within the Conservator's modelled habitat areas. • Each survey consisted of an observer walking through identified habitat counting flying golden sun moth males, collecting data using a hand-held GPS device.	Significant impact guidelines for the critically endangered[4] golden sun moth *(Synemon plana)* (DEWHA, 2009)

[4] GSM was re-listed as vulnerable under the EPBC Act on 7 December 2021, however updated survey guidelines have not yet been released.

Significant impact assessments were undertaken for MNES that were considered to be at risk of impact by the Proposal (i.e. for EPBC Act listed threatened species and communities that were confirmed (or assumed) present in the Proposal Area), in accordance with the Matters of National Environmental Significance: Significant Impact Guidelines 1.1 (Significant Impact Guidelines) (Department of the Environment, 2013).

Potential impacts on ACT significant matters listed under the NC Act were assessed qualitatively, based on the results of the desktop research and field surveys.

5.3 Existing Conditions and Values

5.3.1 Native Vegetation

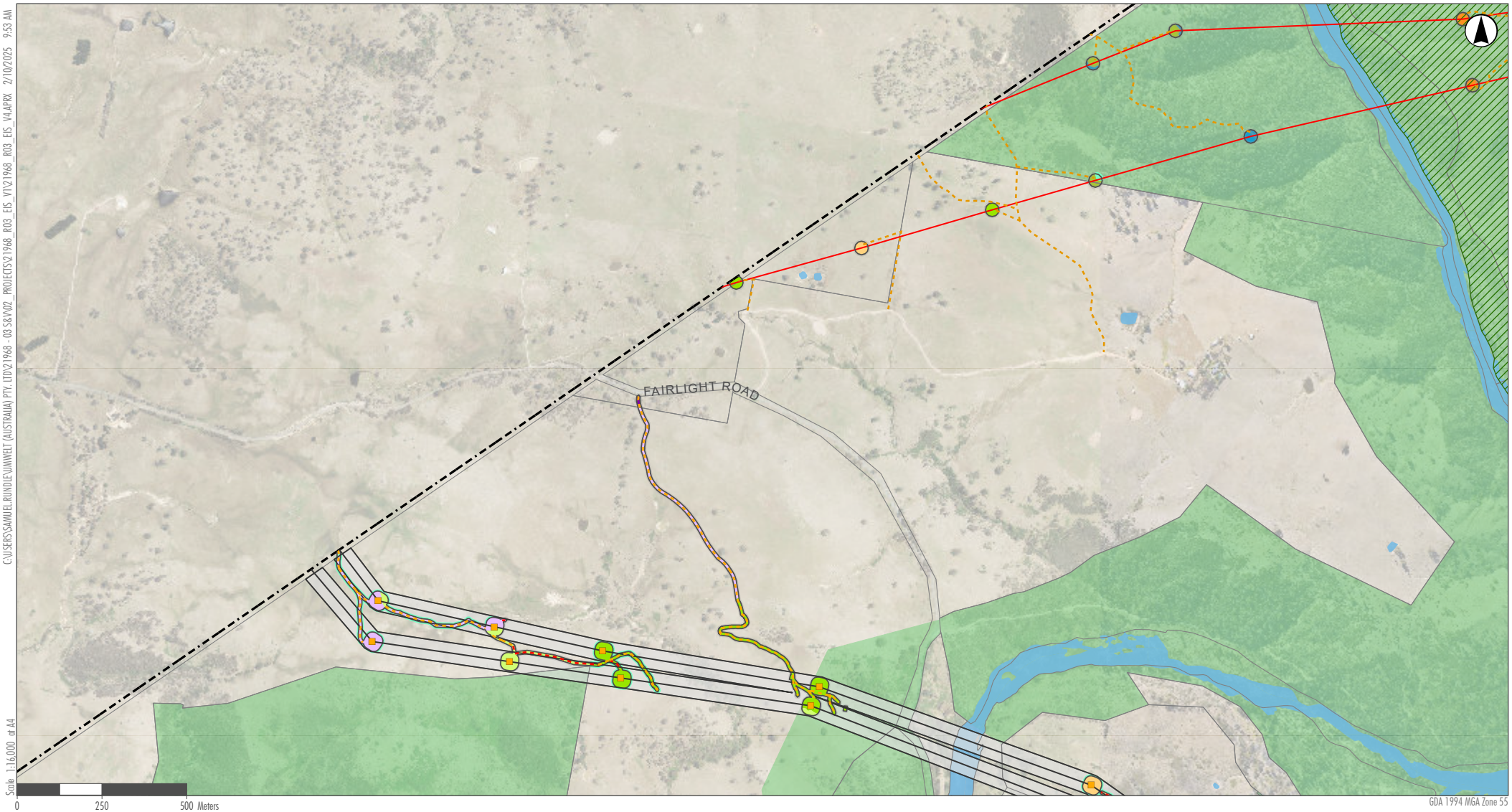
The Proposal Area contains a total of 4.91 ha of native vegetation within the Direct Impact Area, comprising box gum woodland, derived native grassland and dry forest. As described in **Table 5.5** and shown in **Figure 5.1**, three PCTs consisting of 10 zones were mapped in the Direct Impact Area:

- ACT01 Tablelands dry tussock grassland – three condition zones
- ACT16 *Eucalyptus melliodora – E. blakelyi* grassy woodland – five zones comprising both woodland and derived native grassland
- ACT25 *Eucalyptus macrorhyncha* grass/shrub forest – two zones comprising derived native grassland only.

Table 5.5 Vegetation Zones within the Direct Impact Area

Plant Community Type and Vegetation Zone	Description	Extent with the Direct Impact Area (ha)
ACT01.1	Native dominated groundstorey, high native forb diversity	<0.01
ACT01.3	Native dominated groundstorey, low native forb diversity	0.03
ACT01.4	Exotic dominated groundstorey, low native forb diversity	0.17
ACT16.1	Native dominated groundstorey, mature canopy present, regeneration present, moderate-high native forb diversity	0.08
ACT16.4	Native dominated groundstorey, mature canopy absent, regeneration absent, moderate-high native forb diversity	0.02
ACT16.5	Native dominated groundstorey, mature canopy absent, regeneration absent, low native forb diversity	2.27
ACT16.6	Exotic dominated groundstorey, mature canopy present, regeneration present, low native forb diversity	<0.01
ACT16.7	Exotic dominated groundstorey, mature canopy present, regeneration absent, low native forb diversity	0.28
ACT25.4	Native dominated groundstorey, mature canopy absent, regeneration absent, mod-high native forb diversity	0.47
ACT25.5	Native dominated groundstorey, mature canopy absent, regeneration absent, low native forb diversity	1.59
Subtotal – PCTs		**4.91**
Planted	Planted native vegetation	0.24
Exotic	Exotic vegetation	3.97

Plant Community Type and Vegetation Zone	Description	Extent with the Direct Impact Area (ha)
Infrastructure	Infrastructure, e.g. gravel roads	0.22
Not mapped	Areas that have not been mapped (existing towers whose footings are being left in situ)	1.51
Total		**10.84**



Legend

- Access Tracks - New
- Access Tracks - Existing
- Existing Substation
- Transmission Lines to be Removed
- New Alignments
- Direct Impact Area
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development

Vegetation Communities in Proposal Area

- Exotic

ACT16 *Eucalyptus melliodora – E. blakelyi* Grassy Woodland

- ACT16.1 Woodland - Native Groundstorey - Regeneration - Moderate-high
- ACT16.4 Derived Grassland - Native Groundstorey - No Regeneration - Moderate-high
- ACT16.5 Derived Grassland - Native Groundstorey - No Regeneration - Low
- ACT16.6 Woodland - Exotic Groundstorey - Regeneration - Moderate-high

ACT25 *Eucalyptus macrorhyncha* Grass/Shrub Forest

- ACT25.4 Derived Grassland - Native Groundstorey - No Regeneration - Moderate-high
- ACT25.5 Derived Grassland - Native Groundstorey - No Regeneration - Low

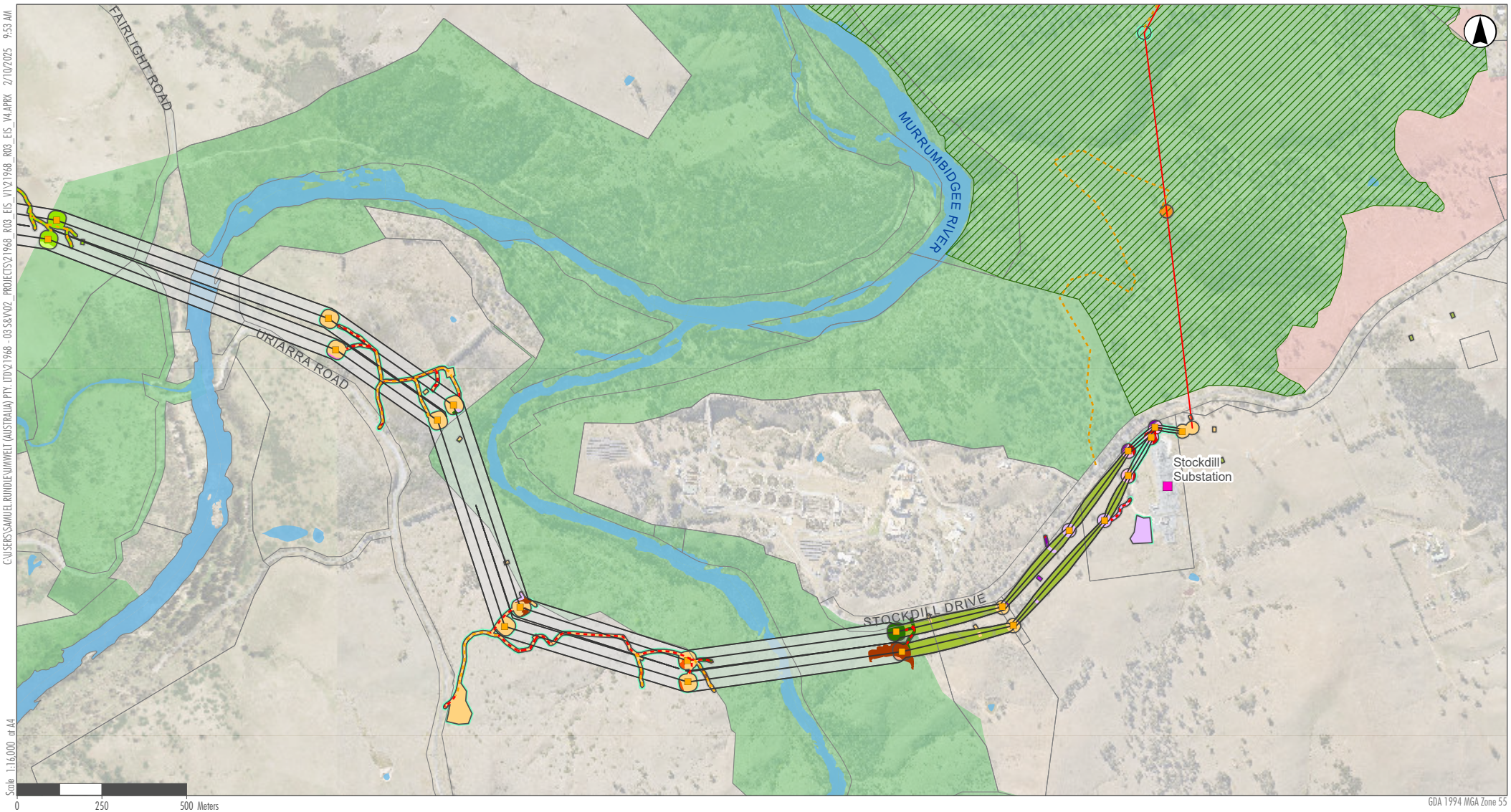
ACT Vegetation Map 2023 (ACTMAPI Data)

- Southern Tableland Dry Sclerophyll Forests
- Southern Tableland Grassy Woodlands
- Temperate Montane Grasslands
- Modified or derived

Image Source: Nearmap (2022) Data source: ACT Government (2023)

FIGURE 5.1A

Vegetation Communities in the Direct Impact Area



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Scale: 1:16,000 at A4

Legend

- Access Tracks - New
- Access Tracks - Existing
- Existing Substation
- Transmission Lines to be Removed
- New Alignments
- Direct Impact Area
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development

Vegetation Communities in Proposal Area

- Planted Native Vegetation
- Exotic
- Infrastructure

ACT01 Tablelands Dry Tussock Grassland

- ACT01.1 Native Groundstorey - High
- ACT01.3 Native Groundstorey - Low
- ACT01.4 Native Groundstorey - Exotic

ACT16 *Eucalyptus melliodora – E. blakelyi* Grassy Woodland

- ACT16.1 Woodland - Native Groundstorey - Regeneration - Moderate-high
- ACT16.4 Derived Grassland - Native Groundstorey - No Regeneration - Moderate-high
- ACT16.5 Derived Grassland - Native Groundstorey - No Regeneration - Low
- ACT16.6 Woodland - Exotic Groundstorey - Regeneration - Moderate-high
- ACT16.7 Woodland - Exotic Groundstorey - No Regeneration - Low

ACT25 *Eucalyptus macrorhyncha* Grass/Shrub Forest

- ACT25.4 Derived Grassland - Native Groundstorey - No Regeneration - Moderate-high
- ACT25.5 Derived Grassland - Native Groundstorey - No Regeneration - Low

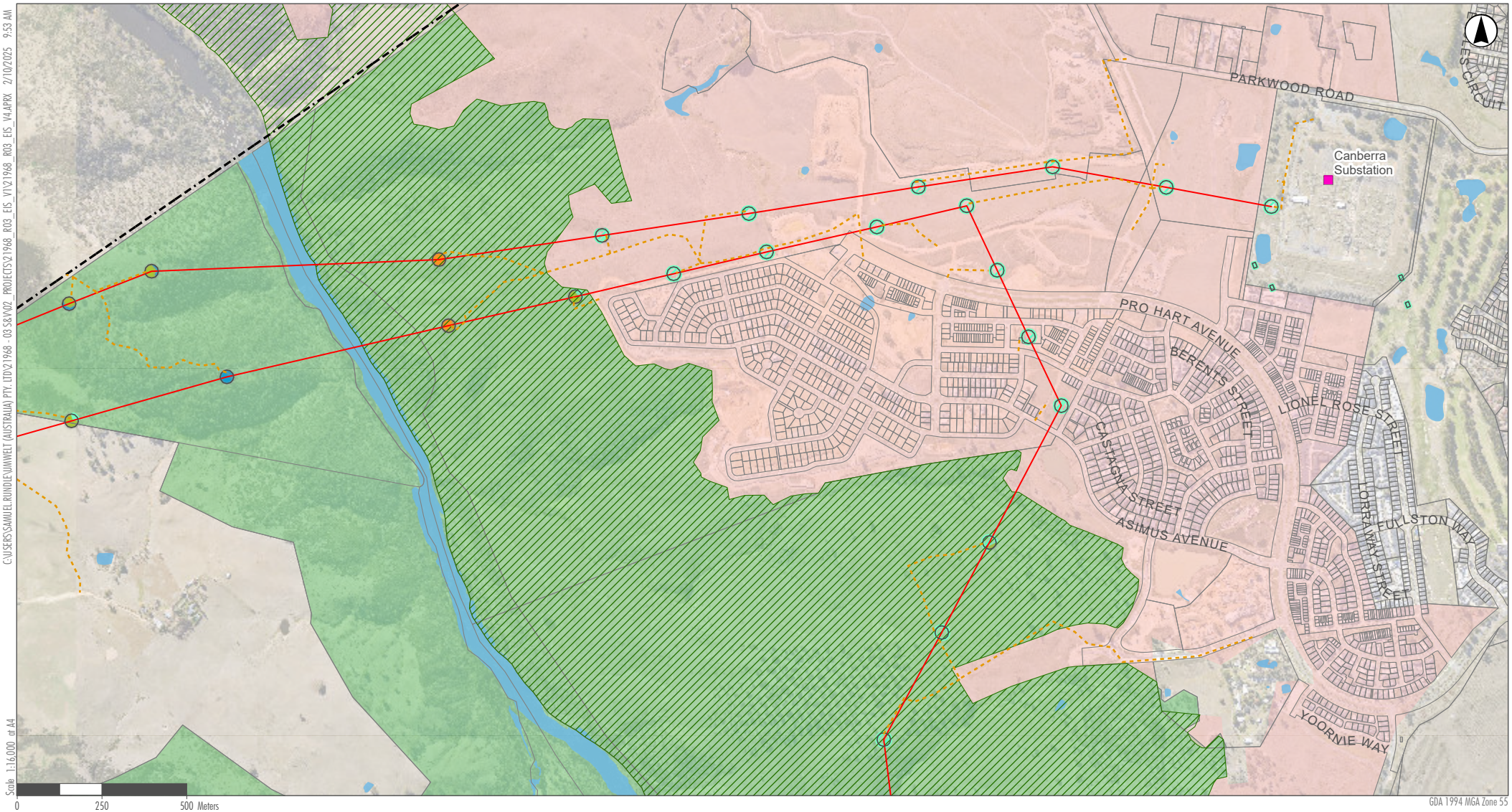
ACT Vegetation Map 2023 (ACTMAPI Data)

- Southern Tableland Dry Sclerophyll Forests
- Southern Tableland Grassy Woodlands
- Temperate Montane Grasslands
- Modified or derived

Image Source: Nearmap (2022) Data source: ACT Government (2023)

FIGURE 5.1B

Vegetation Communities in the Direct Impact Area



Legend

- Access Tracks - New
- Access Tracks - Existing
- Existing Substation
- Transmission Lines to be Removed
- New Alignments
- Direct Impact Area
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development

ACT Vegetation Map 2023 (ACTMAPI Data)

- Southern Tableland Dry Sclerophyll Forests
- Southern Tableland Grassy Woodlands
- Temperate Montane Grasslands
- Modified or derived

FIGURE 5.1C

Vegetation Communities in the Direct Impact Area

Image Source: Nearmap (2022) Data source: ACT Government (2023)

5.3.1.1 Mature and Hollow-bearing Trees

A total of 30 mature *Eucalyptus* trees and 32 hollow-bearing trees were identified along the new alignments corridor (see **Figure 5.2**). Details about each of these trees are provided in Table 4.10 of the BAR at **Appendix G1**.

Six mature Blakely's red gum trees (*Eucalyptus blakelyi*) that are taller than 6 m were recorded within the Direct Impact Area. 6 m is the maximum tree height permitted by Transgrid under operating transmission lines, so any trees that are taller than 6 m and located within the vegetation clearance zone would need to be lopped or removed. An additional 10 trees are expected to grow taller than 6 m and are located where they would eventually impinge on the vegetation clearance zone. For the purpose of this EIS, Blakely's red gum within 10 m of the vegetation clearance zone, and yellow box (*Eucalyptus melliodora*) within 15 m of the vegetation clearance zone, have been assessed the same as trees located with the vegetation clearance zone that are already 6 m tall. These trees are all shown in **Figure 5.2**.

5.3.1.2 Habitat Connectivity

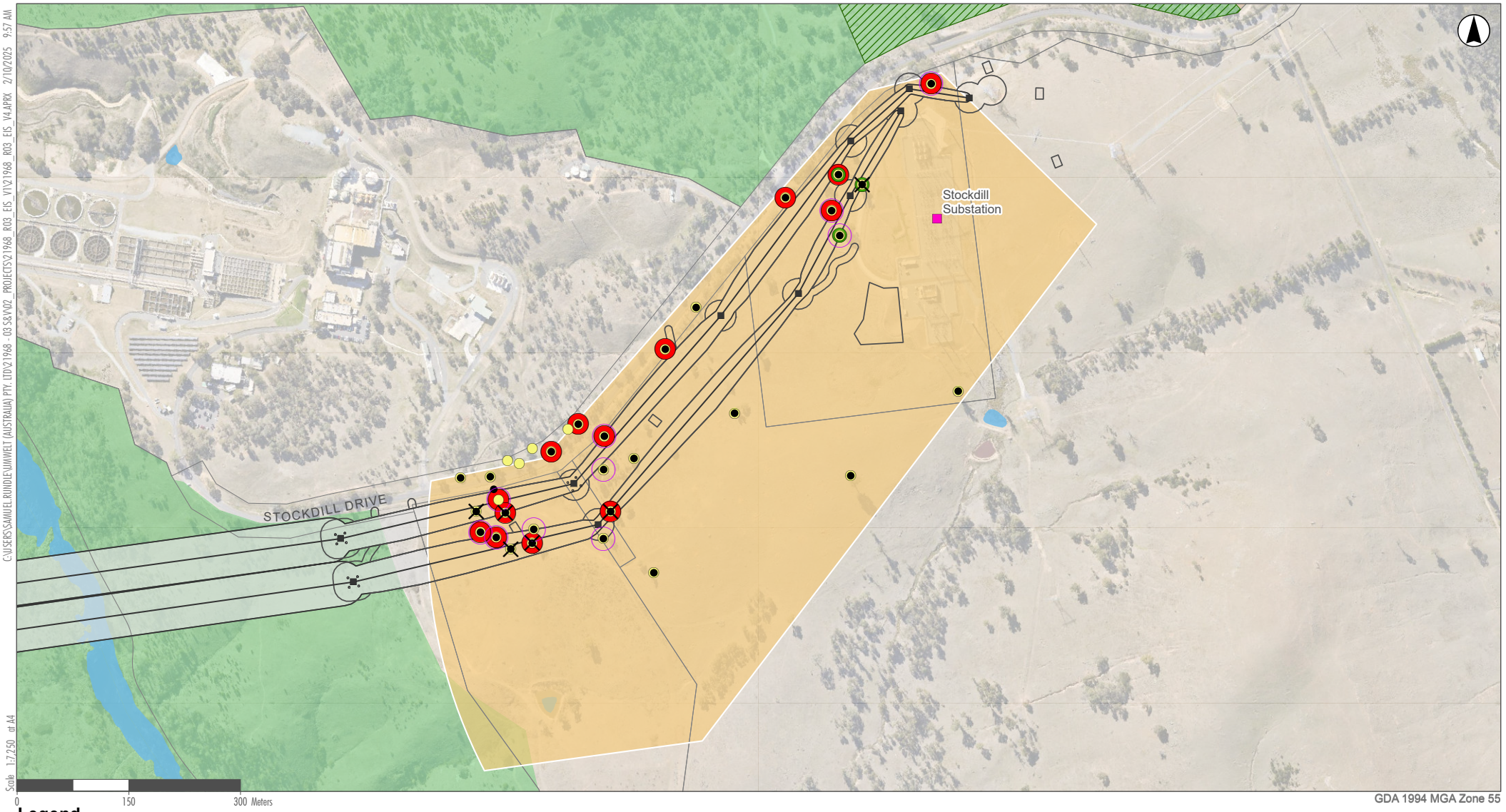
The ACTmapi 'Significant species, Vegetation Communities and Registered Trees' map includes layers that show habitat connectivity modelling values for generalist, woodland, and forest bird species throughout the ACT, as well as connectivity values in local and regional contexts.

The new alignment corridors contain low-moderate connectivity values for generalist and forest bird species, and patches of high connectivity value for woodland bird species (see **Figure 5.3**, **Figure 5.4** and **Figure 5.5**, respectively). Areas of high connectivity values for generalist, forest and woodland bird species are also located along the Murrumbidgee and Molonglo River corridors, but outside of the Direct Impact Area.

The new alignments are adjacent to the Uriarra Creek and Swamp Creek corridors, which also have high connectivity value. Although these areas are located outside of the Direct Impact Area and would not be subject to direct impacts from the Proposal, they are likely to provide important breeding and foraging habitat and landscape connectivity pathways for a range of bird species.

Additionally, the Proposal Area is located approximately 3 km from Brindabella National Park, which provides a high level of habitat connectivity for forest and generalist bird species and a moderate level for woodland bird species.

Mature trees along the eastern end of the alignment, adjacent to Stockdill Drive, are considered an important part of the landscape for superb parrot movement.



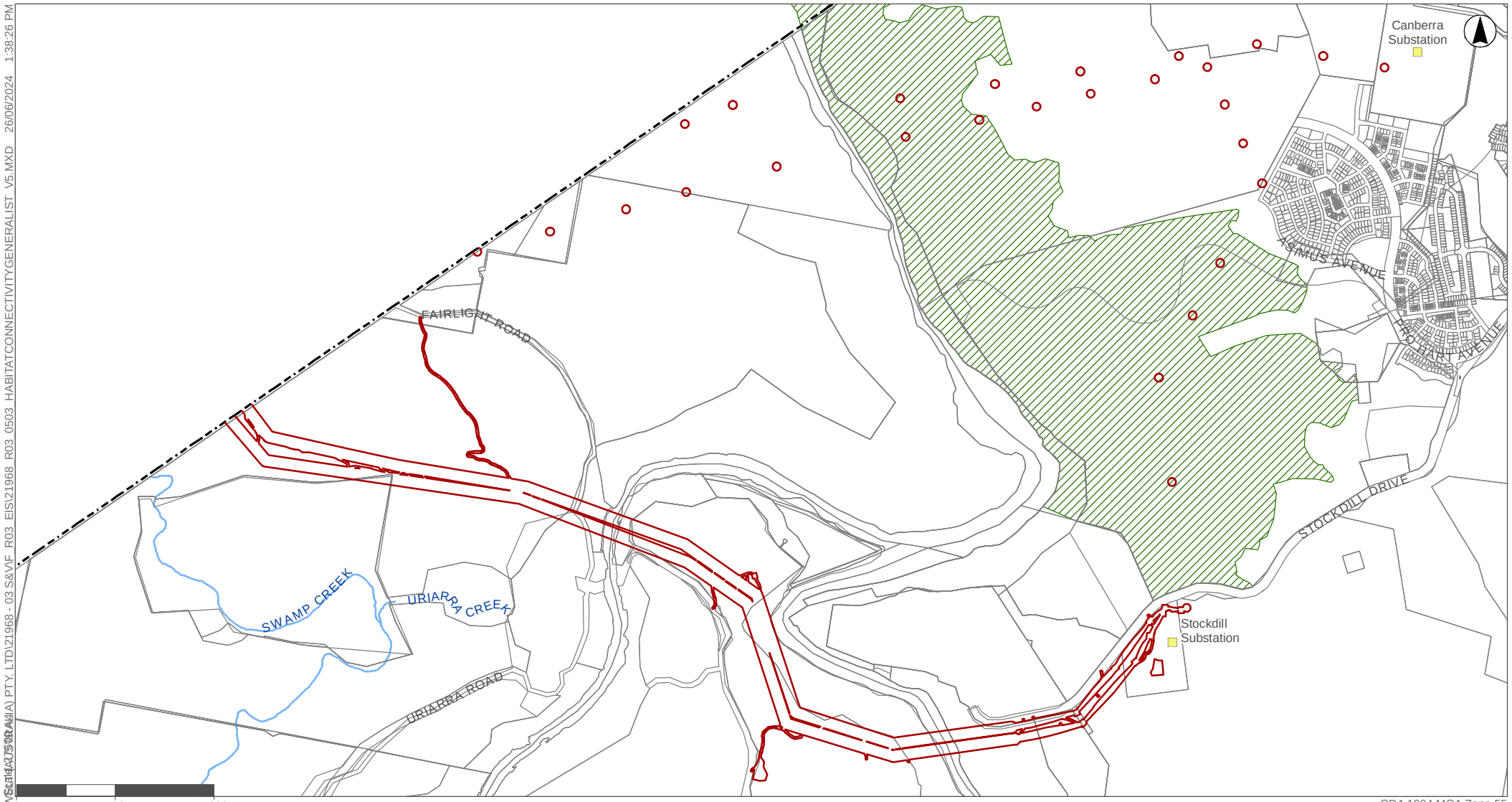
Legend

- Mature Tree
- Trees to be Lopped
- Trees to be Removed
- Tree Critical for Superb Parrot Movement
- Potential Gang-gang Cockatoo Breeding Tree
- Hollow-Bearing Tree
- New Alignments
- Direct Impact Area
- Superb Parrot Tree Assessment Area
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Existing Substation

FIGURE 5.2

Mature and Hollow Bearing Trees
Near the Direct Impact Area

Image Source: Nearmap (2023) **Data source:** ACT Government (2023)



Legend

- Proposal Area
- Habitat (Colonisation Potential) Generalist Model
  - Low
  - Moderate
  - High
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Existing Substation

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FIGURE 5.3

Habitat Connectivity Values – Generalist Bird Species

Image Source: Nearmap (2023) **Data source:** ACT Government (2023)

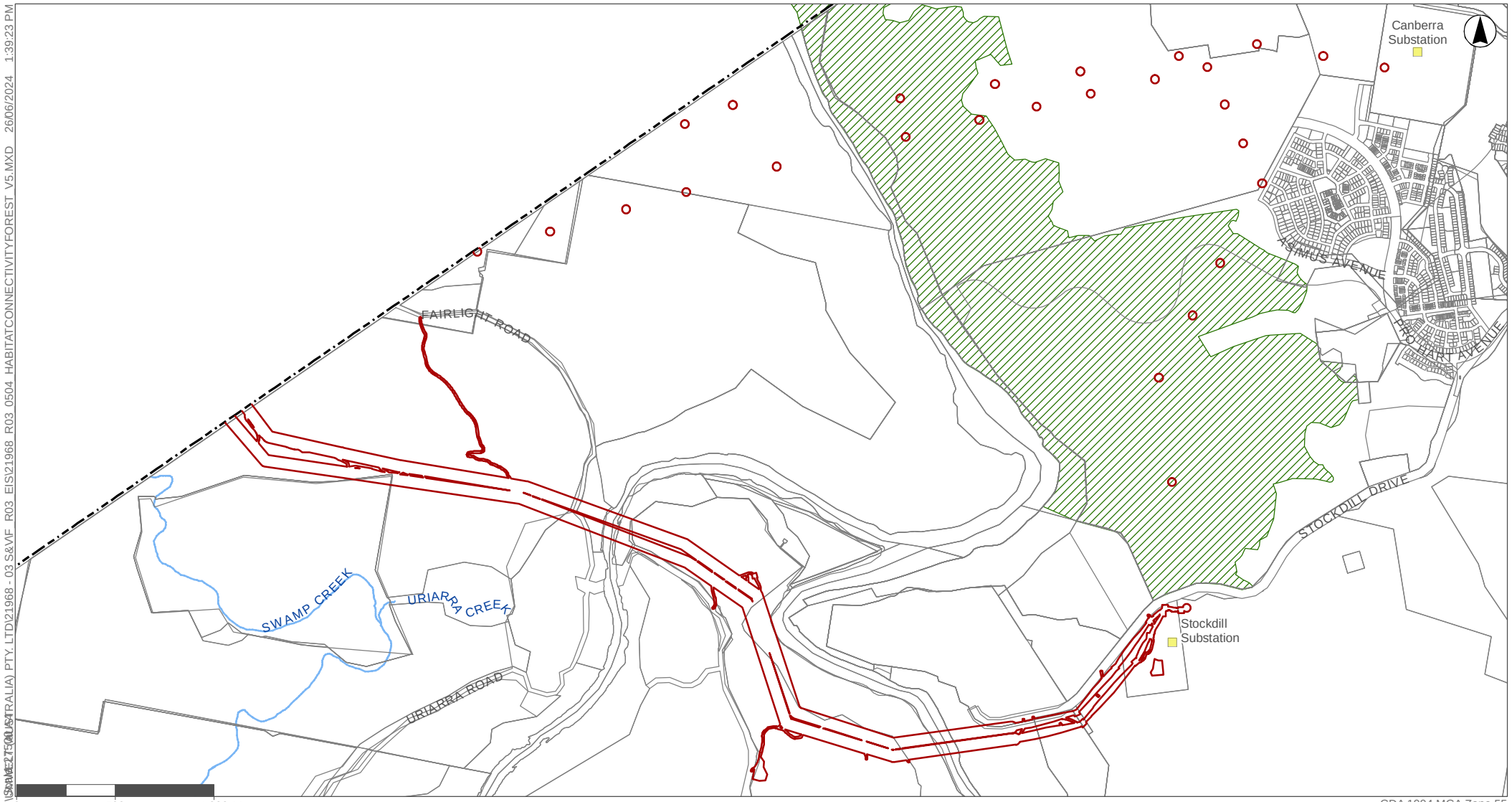

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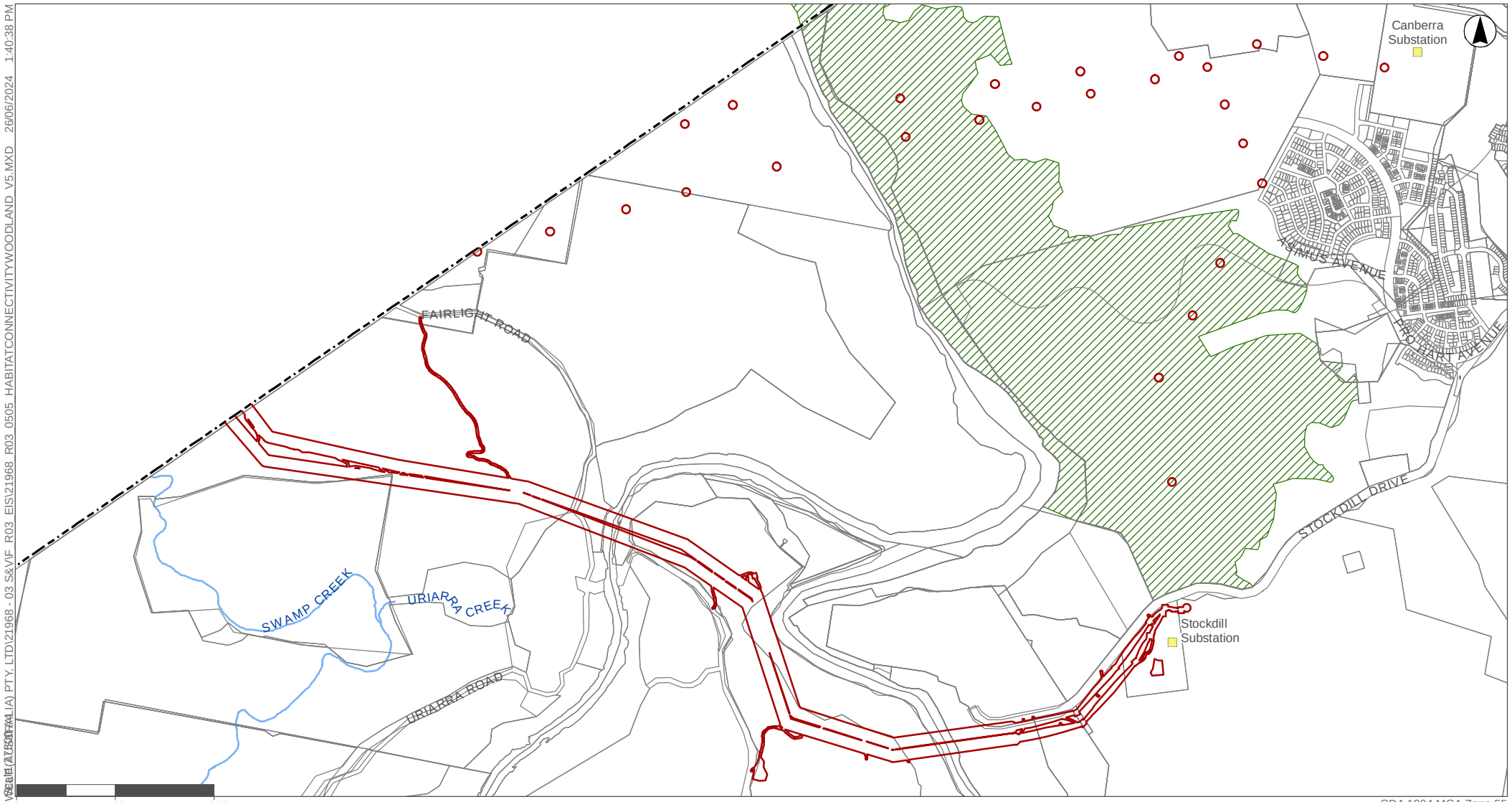
FIGURE 5.4

Habitat Connectivity Values – Forest Bird Species (ACTmapi

Image Source: Nearmap (2023) **Data source:** ACT Government (2023)



Legend

- Proposal Area
- Habitat (Colonisation Potential) Woodland Model
  - Low
  - Moderate
  - High
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Existing Substation

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FIGURE 5.5

Habitat Connectivity Values – Woodland Bird Species

Image Source: Nearmap (2023) **Data source:** ACT Government (2023)

5.3.2 Threatened Ecological Communities

The EPBC Act Protected Matters Search (**Appendix A** to **Appendix G1**) identified three listed TECs as likely or known to occur within 10 km of the Proposal Area:

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (box gum woodland) – critically endangered
- Natural Temperate Grassland of the South Eastern Highlands (natural temperate grassland) – critically endangered
- Alpine sphagnum bogs and associated fens – endangered.

The Proposal Area does not contain native vegetation that constitutes alpine sphagnum bogs and associated fens. This TEC has therefore not been considered further in this EIS. The presence of the other two TECs (White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland Natural Temperate Grassland of the South Eastern Highlands) is discussed in the following sections.

Three TECs are listed under the NC Act which conform with the above EPBC Act listed TECs. Thus no other TECs could occur in the Direct Impact Area.

5.3.2.1 EPBC Act-listed White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

Vegetation zones ACT16.1, ACT16.4 and ACT16.5, covering a total of 2.37 ha across 11 areas, are present in the Direct Impact Area and meet the classification criteria for the EPBC Act listed box gum woodland critically endangered ecological community, in accordance with the National Recovery Plan for White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (BGW Recovery Plan) (NSW DECCW, 2011). As shown in **Table 5.6** and **Figure 5.6**, the majority of the TEC (2.29 ha) is in the derived native grassland form, of which 2.27 ha is low quality. All zones were assessed as Class B in accordance with the Box Gum Woodland Recovery Plan due to the sparse cover (or absence) of canopy species. ACT16.6, ACT16.7, ACT01 and ACT25 do not meet the classification criteria of the EPBC Act listed TEC.

Noting that the Direct Impact Area sits within a landscape that supports large areas of box gum woodland (as previously assessed by Umwelt and as indicated on ACTmapi woodland mapping), the patch sizes are considered to be more than 2 ha.

Table 5.6 Patches of EPBC Act-Listed box gum woodland in the Direct Impact Area

Patch	Extent (ha)			
	ACT16.1 – Woodland, native groundstorey, regeneration, high quality	ACT16.4 – Derived native grassland, no regeneration, moderate-high quality	ACT16.5 – Derived native grassland, no regeneration, low quality	Total (ha)
1	0.03	0.01	0.02	**0.06**
2	0.01	0.01	0.68	**0.70**
3	0.01	-	0.66	**0.67**
4	0.03	-	0.02	**0.05**
5	-	-	0.89	**0.89**
Total	**0.08**	**0.02**	**2.27**	**2.37**

5.3.2.2 NC Act-listed Yellow Box – Blakely's Red Gum Woodland

The NC Act listed Yellow Box – Blakely's Red Gum Grassy Woodland critically endangered ecological community is defined in the Yellow Box-Blakely's Red Gum Grassy Woodland Endangered Ecological Community Action Plan (EPSDD, n.d.). Clear diagnostic criteria and condition thresholds are not specifically defined for the TEC; however, the ecological community is stated to be a component of the EPBC Act listed box gum woodland. As described in **Section 5.3.2**, there is 2.37 ha of EPBC Act box gum woodland in the Direct Impact Area, thus there is also 2.37 ha of NC Act listed box gum woodland in the Direct Impact Area.

EPBC Act and NC Act listed box gum woodland are collectively referred to as BGW in this EIS.

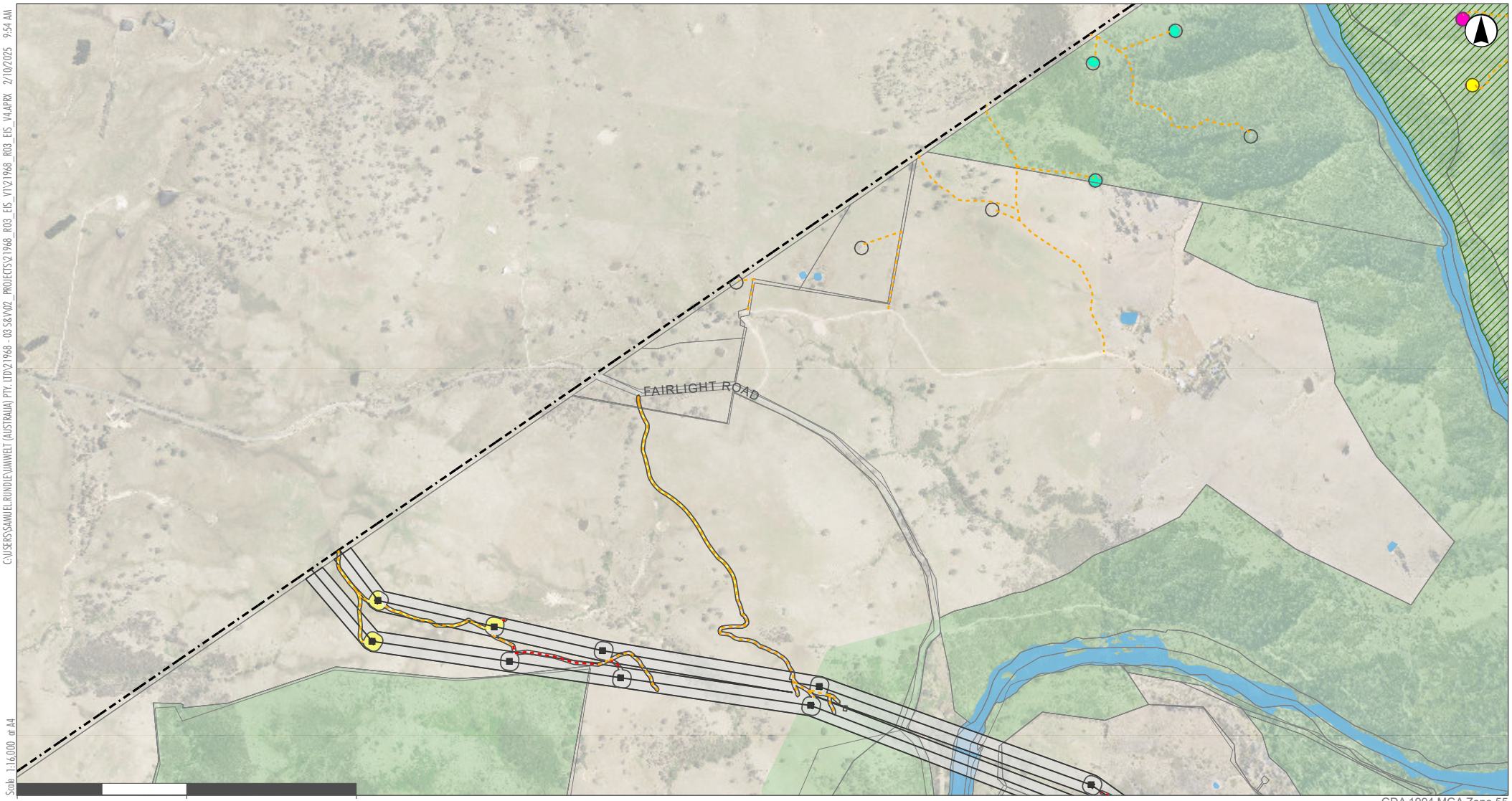
5.3.2.3 EPBC Act-listed Natural Temperate Grassland of the South Eastern Highlands

There is less than 0.01 ha of vegetation zone ACT01.1 in the Direct Impact Area which meets the classification criteria for the EPBC Act listed natural temperate grassland critically endangered ecological community (see **Figure 5.6**). This patch meets the high to very high condition threshold (patches with good native coverage and high native plant diversity) given that it has at least 12 non-grass native species and over 50% ground cover foliage of kangaroo grass, in accordance with the Approved Conservation Advice (including listing advice) for the Natural Temperate Grassland of the South Eastern Highlands (NTG Conservation Advice) (TSSC, 2016a).

The NTG Conservation Advice considers areas that are critical to the survival of the TEC to be all patches that meet the key diagnostic characteristics and condition thresholds for the ecological community plus buffer zones. A buffer zone is defined as a "…contiguous area immediately adjacent to a patch of the ecological community that is important for protecting its integrity. The purpose of the buffer zone is to help protect and manage the national ecological community… As the area of the buffer lies to the outside, around a patch, it is not part of the ecological community and is not formally protected as a matter of national environmental significance… The recommended minimum buffer zone for the ecological community is 30 metres from the edge of a patch. A larger buffer zone may be applied, where practical, to protect patches that are of particularly high conservation value, or if patches are down slope of drainage lines or a source of nutrient enrichment" (TSSC, 2016a).

Recognising the high quality of the patch of EPBC Act listed natural temperate grassland within the Direct Impact Area and the position of the patch adjacent to a larger patch of ACT01.3 and ACT01.4 which does not meet the natural temperate grassland diagnostic criteria, it has been determined that the width of the buffer zone should equal the distance from the natural temperate grassland (ACT01.1) to the far edge of the adjacent grassland area (ACT01.3 / ACT01.4), which is a distance of 40 m (see **Figure 5.6**). The buffer zone covers a total area of 0.50 ha, of which 0.29 ha extends beyond the Direct Impact Area (comprising 0.13 ha of ACT01.1, 0.07 ha of ACT01.3, and 0.09 ha of ACT01.4).

Potential indirect impacts are discussed in **Section 5.4.6**, and management measures to be implemented to mitigate and manage those impacts are discussed in **Section 5.6.2**.



Legend

- Access Tracks - New
- Access Tracks - Existing
- Access Tracks - Existing
- New Alignments
- Direct Impact Area
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Existing Substation
- NTG Buffer Zone

Threatened Ecological Communities (Umwelt)

- Box Gum Woodland - Woodland - Moderate-high (ACT16.1)
- Box Gum Woodland - Derived native grassland - Moderate-high (ACT16.4)
- Box Gum Woodland - Derived native grassland - Low (ACT16.5)

Threatened Ecological Communities (ACT Vegetation Map 2023)

- Potential Yellow Box - Blakely's Red Gum Grassy Woodland

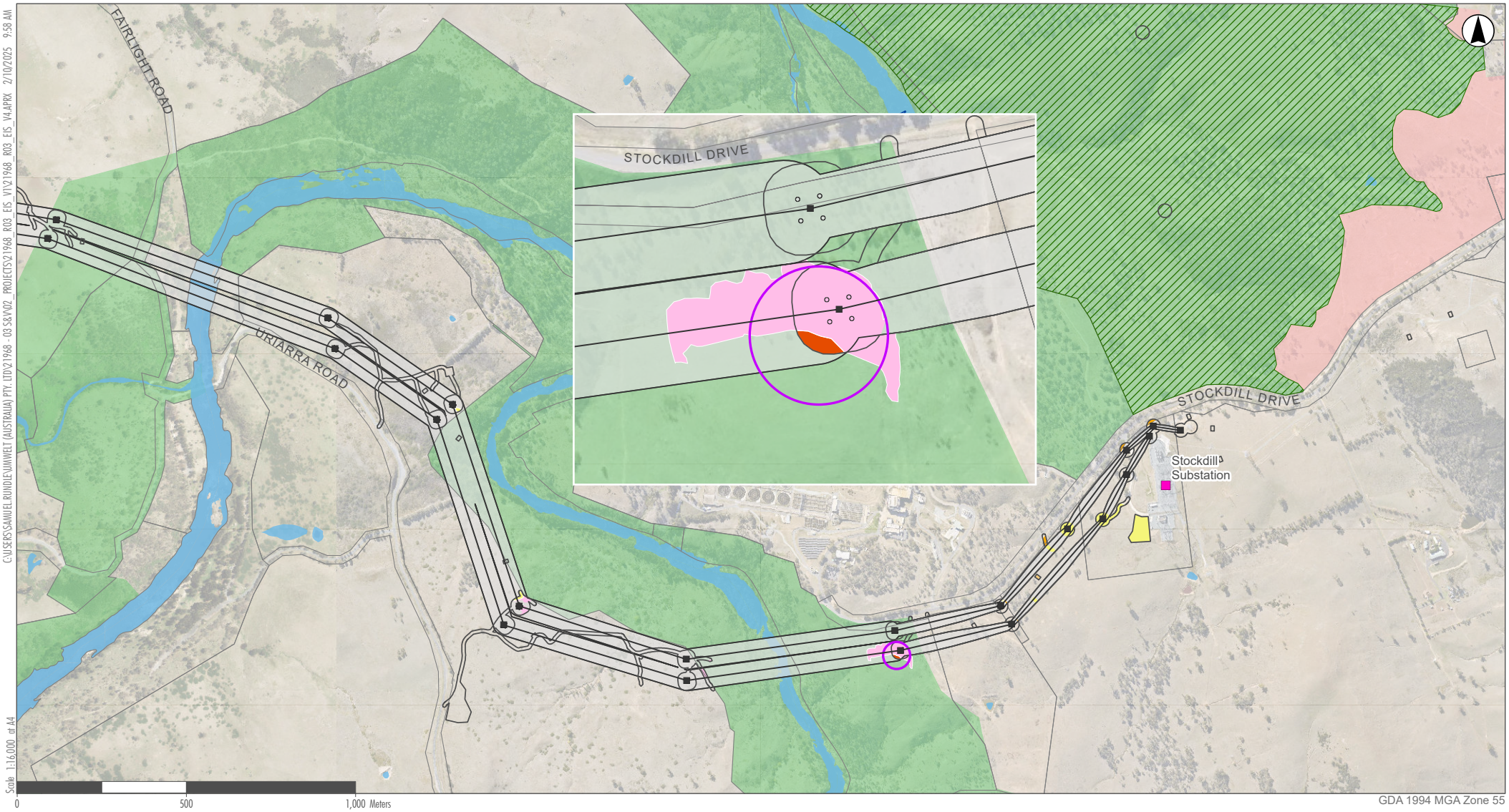
Threatened Ecological Communities (Capital Ecology)

- Natural Temperate Grassland - Mod-High Diversity (ACT01.2)
- Natural Temperate Grassland - Low Diversity (ACT01.3)
- Natural Temperate Grassland - Exotic Dom - Low (ACT01.4) [Does not meet the listing criteria on its own]

FIGURE 5.6A

Threatened Ecological Communities in the Direct Impact Area

Image Source: Nearmap (2023) **Data source:** ACT Government (2023)



Legend

- New Alignments
- Direct Impact Area
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Existing Substation
- NTG Buffer Zone

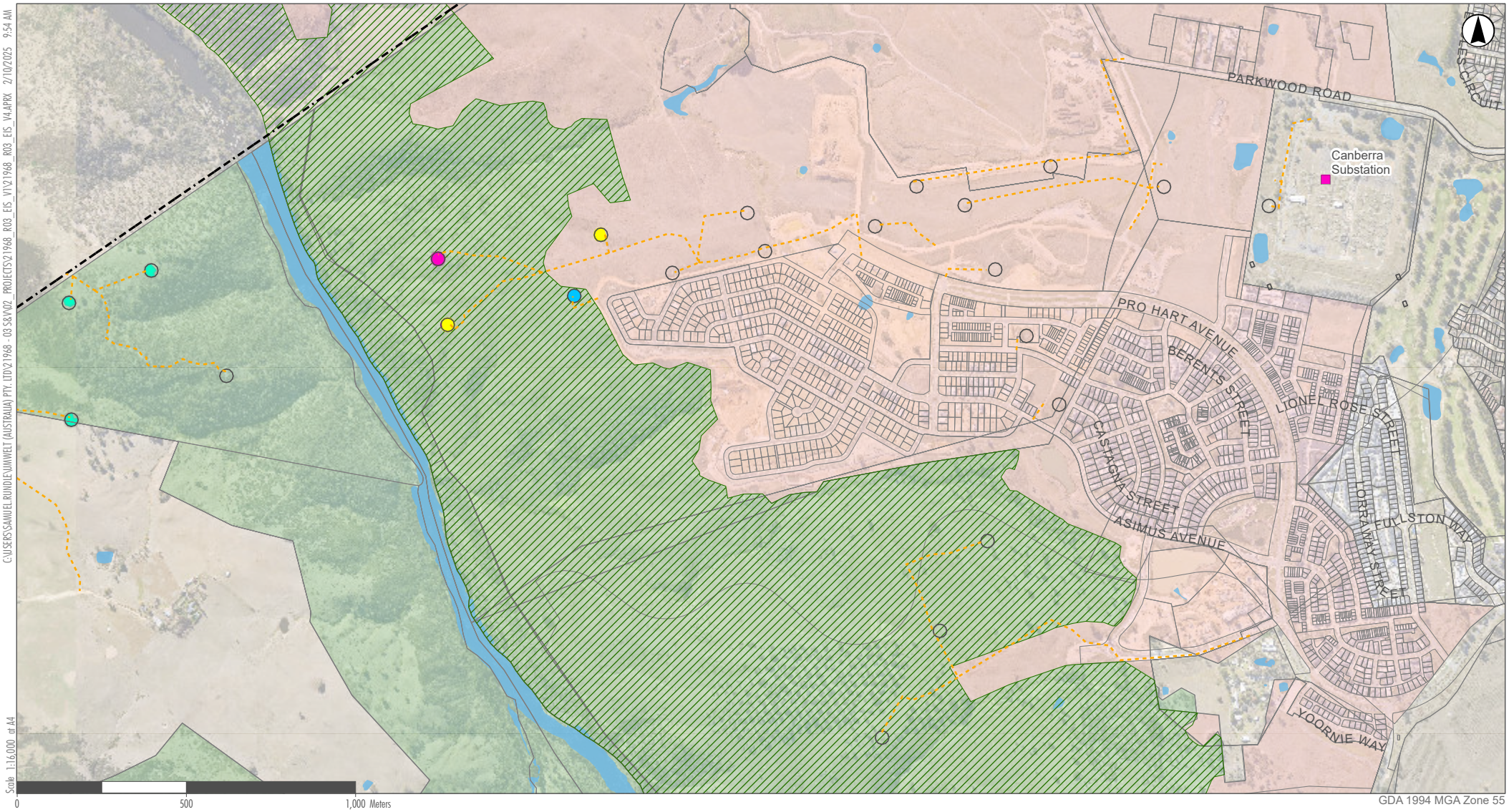
Threatened Ecological Communities

- Natural Temperate Grassland - High (ACT01.1)
- Natural Temperate Grassland - Exotic groundstorey - Low (ACT01.4) [Does not meet the listing criteria on its own]
- Box Gum Woodland - Woodland - Moderate-high (ACT16.1)
- Box Gum Woodland - Derived native grassland - Moderate-high (ACT16.4)
- Box Gum Woodland - Derived native grassland - Low (ACT16.5)

Image Source: Nearmap (2023) **Data source:** ACT Government (2023)

FIGURE 5.6B

Threatened Ecological Communities in the Direct Impact Area



Legend

- Access Tracks - Existing
- New Alignments
- Direct Impact Area
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Existing Substation
- NTG Buffer Zone

Threatened Ecological Communities (ACT Vegetation Map 2023)

- Potential Yellow Box - Blakely's Red Gum Grassy Woodland

Threatened Ecological Communities (Capital Ecology)

- Natural Temperate Grassland - Mod-High Diversity (ACT01.2)
- Natural Temperate Grassland - Low Diversity (ACT01.3)
- Natural Temperate Grassland - Exotic Dom - Low (ACT01.4) [Does not meet the listing criteria on its own]

FIGURE 5.6C

Threatened Ecological Communities in the Direct Impact Area

Image Source: Nearmap (2023) **Data source:** ACT Government (2023)

5.3.2.4 NC Act-listed Natural Temperate Grassland

No specific diagnostic criteria for the NC Act listed Natural Temperate Grassland critically endangered ecological community are defined. However, the ACT Conservation Advice for Natural Temperate Grassland (Scientific Committee, 2020) states that the NC Act listed TEC is encompassed in the EPBC Act listed TEC, as described in **Section 5.3.2.3**. There is therefore less than 0.01 ha of the NC Act listed natural temperate grassland in the Direct Impact Area.

EPBC Act and NC Act listed natural temperate grassland are collectively referred to as NTG in this EIS.

5.3.3 Threatened Flora

The EPBC Act Protected Matters Search (**Appendix A** to **Appendix G1**) identified 13 listed flora species as likely or known to occur within 10 km of the Proposal Area. As shown in **Table 5.7**, eight of these species are also listed under the NC Act. One additional NC Act listed threatened flora species is identified on ACTmapi as potentially occurring in the Proposal Area (see **Table 5.7**).

Likelihood of occurrence assessments were undertaken in the BAR for each of these species (see **Appendix B** to **Appendix G1**) and have been replicated in **Table 5.7**. It was determined that four threatened flora species have a moderate or high likelihood of occurrence in the Proposal Area, two of which have previously been recorded in the vicinity of the Proposal Area (see **Figure 5.7**):

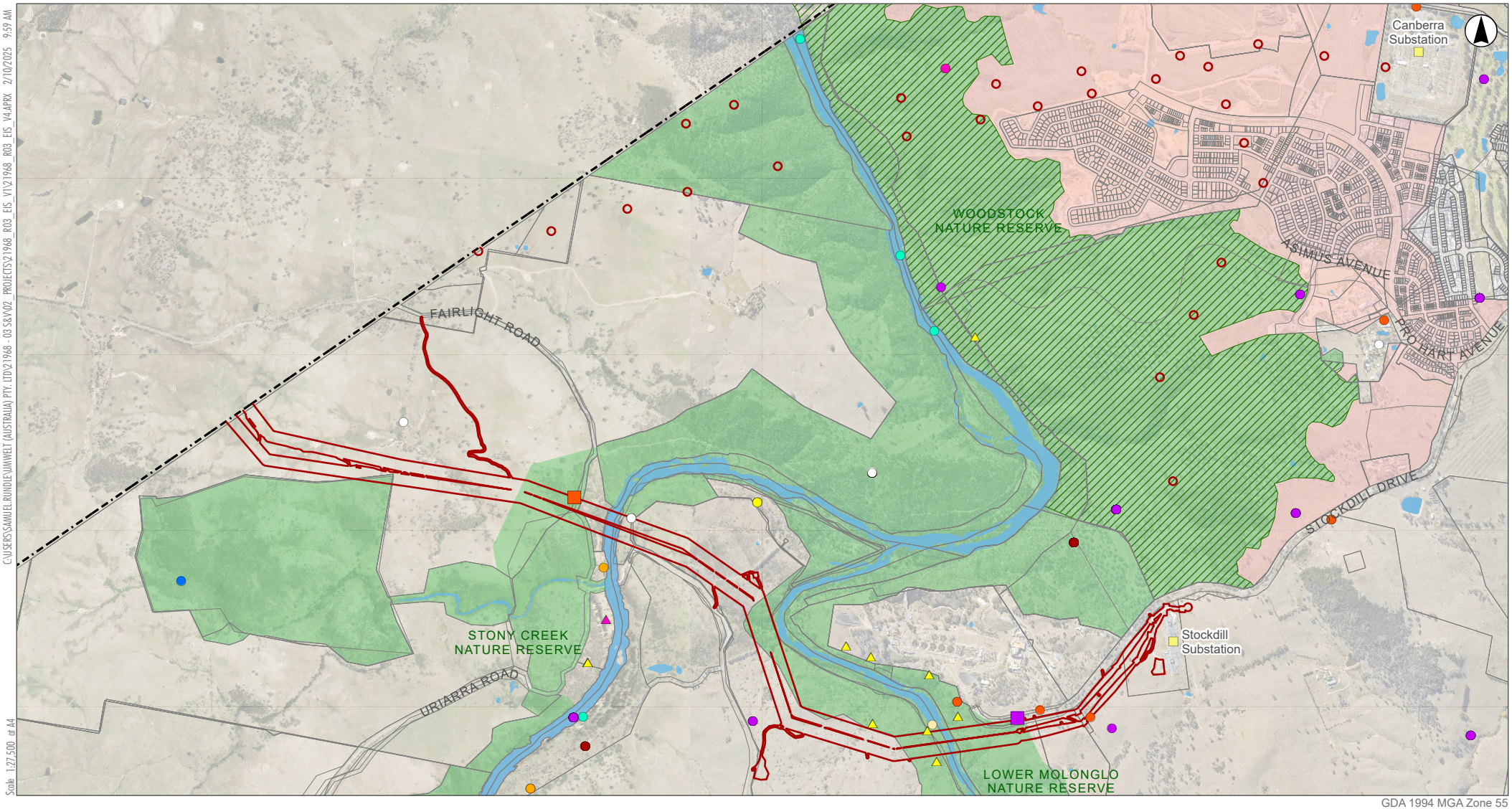
- Hoary sunray (*Leucochrysum albicans* subsp. *tricolor*) – endangered (EPBC Act), not listed (NC Act)
- Small purple-pea (*Swainsona recta*) – endangered (EPBC Act and NC Act)
- Austral toadflax (*Thesium australe*) – vulnerable (EPBC Act and NC Act)
- Pale pomaderris (*Pomaderris pallida*) – vulnerable (EPBC Act and NC Act).

Surveys were therefore undertaken for these four species, as detailed in the following sections.

Table 5.7 Likelihood of Occurrence Assessments for Threatened Flora Species

Species Name	EPBC Act Listing Status	NC Act Listing Status	Likelihood of Occurrence
Blue-tongued orchid (*Pterostylis oreophila*)	Critically endangered	Critically endangered	Nil – The Proposal Area is outside the geographic range for this species.
Basalt pepper-cress (*Lepidium hyssopifolium*)	Endangered	N/A	Low – Potential habitat is not present within the construction footprint.
Button wrinklewort (*Rutidosis leptorhynchoides*)	Endangered	Endangered	Low – This species has some potential to occur in a portion of the construction footprint. However, given the geographic distribution of this species, there is a low likelihood that the species is present in the Proposal Area.
Cotoneaster pomaderris (*Pomaderris cotoneaster*)	Endangered	N/A	Low – Potential habitat is unlikely to be present within the construction footprint. The Proposal Area is also outside the geographic range for this species.

Species Name	EPBC Act Listing Status	NC Act Listing Status	Likelihood of Occurrence
Hoary sunray (*Leucochrysum albicans* subsp. *tricolor*)	Endangered	N/A	Moderate – Potential habitat of box gum woodland is present within the construction footprint. Species has been recorded near the Proposal Area.
Murrumbidgee bossiaea (*Bossiaea grayi*)	N/A	Endangered	Low – Potential habitat is not present within the construction footprint.
Small purple-pea (*Swainsona recta*)	Endangered	Endangered	Moderate – Potential habitat of box gum woodland is present within the construction footprint.
Tarengo leek orchid (*Prasophyllum petilum*)	Endangered	Endangered	Low – Potential woodland and grassland habitat may be present in the construction footprint. However, the likelihood of occurrence is low as the known distribution of the species which shows it is unlikely to occur in proximity to the Proposal Area.
Austral toadflax (*Thesium australe*)	Vulnerable	Vulnerable	Moderate – Potential habitat of box gum woodland and rocky habitat is present within the construction footprint.
Black gum (*Eucalyptus aggregata*)	Vulnerable	Vulnerable	Low – Rare species habitat of the black gum may be present within the Direct Impact Area, but the likelihood is low.
Ginninderra peppercress (*Lepidium ginninderrense*)	Vulnerable	Endangered	Low – Potential habitat is not present in the construction footprint.
Pale pomaderris (*Pomaderris pallida*)	Vulnerable	Vulnerable	Moderate – Potential habitat of box gum woodland is present in the construction footprint. Species has been recorded within the Proposal Area and in surrounding areas.
Yass daisy (*Ammobium craspedioides*)	Vulnerable	N/A	Low – Box gum woodland habitat is present within the construction footprint. However, the known distribution of this species is north of the Proposal Area in the Yass region.
Large-fruit fireweed (*Senecio macrocarpus*)	Vulnerable	N/A	Low – The Proposal Area is just outside the geographic range of the species, and there is unlikely to be potential habitat within the construction footprint.



Legend

- Proposal Area
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Existing Substation

Observations from Proposal Surveys

- Gang-gang Cockatoo (5)
- White-winged Triller (1)

Threatened Fauna (ALA)

- Booroolong Frog
- Diamond Firetail
- Gang-gang Cockatoo
- Green And Golden Bell Frog
- Murray Cod
- Painted Honeyeater
- Pink-tailed Worm-lizard
- South-eastern Brown Treecreeper
- Southern Whiteface
- Superb Parrot
- Tiger Snake
- White-throated Needletail

Threatened Flora (ALA)

- *Leucochrysum albicans subsp. tricolor*
- *Pomaderris pallida*

Image Source: Nearmap (2023) **Data source:** ACT Government (2023)

FIGURE 5.7

Threatened Species Sightings near the Proposal Area

5.3.3.1 Hoary sunray

Hoary sunray is a low tufted to mounding perennial straw daisy that occurs in a diversity of habitats including grassy woodlands, dry forest and native grassland, all of which are located in the construction footprint. It is endemic to south-eastern Australia, where approximately 30 populations have been recorded in the ACT. Around 20 of these subpopulations occur in public reserves, with the remainder occurring on roadsides or unsecured private land. The ALA has a single record of the species occurring within the Murrumbidgee River corridor, south of the Proposal Area (see **Figure 5.7**).

Targeted surveys for hoary sunray were undertaken on 18–19 October 2023 throughout the construction footprint. The species was not recorded during these surveys, and has therefore not been considered further in this EIS.

5.3.3.2 Small purple-pea

Small purple-pea is a slender, erect, sparsely hairy perennial forb which occurs predominantly in grassy woodlands, but sometimes extends into grassy open forest. Flora species which are typically co-located in small purple-pea habitat in the ACT include Blakely's red gum, yellow box, white box, kangaroo grass (*Themeda triandra*), spear grass (*Stipa* spp.) amongst others, many of which have been confirmed within the construction footprint. The Conservation Advice for *Swainsona recta* (small purple pea) (DCCEEW, 2023b) indicates that the small purple-pea is not known to occur in the Belconnen / Uriarra areas of the ACT and there are no records of the species near the Proposal Area in NatureMapr or the ALA.

Targeted surveys for small purple-pea were undertaken on 18–19 October 2023 throughout the construction footprint. The species was not recorded during these surveys, and has therefore not been considered further in this EIS.

5.3.3.3 Austral toadflax

Austral toadflax is a hairless, yellowish-green perennial herb with slender, wiry stems to 40 cm high, and tiny, white flowers. The closest known population of Austral toadflax to the Proposal is at Kambah Pool Reserve (along the Murrumbidgee River tens of kilometres upstream of the Proposal) (Scientific Committee, 2019c), in open woodland with a grassy understorey (approximately 200 plants). There are no records of the species near the Proposal Area in NatureMapr or the ALA.

Targeted surveys for Austral toadflax were completed on 13 February and 18–19 October 2023 across the construction footprint. The species was not recorded during these surveys, and has therefore not been considered further in this EIS.

5.3.3.4 Pale pomaderris

Pale pomaderris is a small round shrub up to 1.5 m tall that grows in dry open forests and shrub communities. The majority of the known ACT populations are located along the Murrumbidgee, Cotter and Paddys Rivers, although it has been recorded within a range of other areas including Belconnen, Stony Creek and the Lower Molonglo, which are located in the vicinity of the Proposal Area. The ACT sites are only on the eastern banks of the rivers, on shallow sandy loams over granite rock. NatureMapr and ALA both show that the species has been recorded along the Molonglo River corridor south of the LMWQCC, and in the Murrumbidgee River corridor near Uriarra Crossing and Woodstock Nature Reserve (see **Figure 5.7**).

As the species is large and highly distinctive, particularly when flowering in September to December, an informal survey was undertaken for the species, with observations recorded as part of the vegetation assessment surveys in October 2023. The species was not recorded during these surveys, and has therefore not been considered further in this EIS.

5.3.4 Threatened Fauna

The EPBC Act Protected Matters Search (**Appendix A** to **Appendix G1**) identified 40 listed fauna species as likely or known to occur within 10 km of the Proposal Area. As shown in **Table 5.8**, 25 species are listed under the NC Act. These numbers were based on searches of ACTmapi, NatureMapr, the ALA and eBird. **Figure 5.7** shows threatened species records from the Proposal Area and surrounds.

Table 5.8 Threatened Fauna Species Likely or Known to Occur within 10 km of the Proposal Area

Species Class	Number of EPBC Act Listed Species	Number of NC Act Listed Species
Bird	18	9
Mammal	8	7
Reptile	3	1
Insect	2	2
Frog	5	3
Fish	4	3
Total	**40**	**25**

Likelihood of occurrence assessments were undertaken in the BAR for each of these species (see **Appendix B** to **Appendix G1**) and have been replicated in **Table 5.9**. It was determined that 13 threatened fauna species have a moderate or high likelihood of occurrence in the Proposal Area:

- Birds:
  - Superb parrot (*Polytelis swainsonii*) – vulnerable (EPBC Act and NC Act)
  - Gang-gang cockatoo (*Callocephalon fimbriatum*) – endangered (EPBC Act and NC Act)
  - Little eagle (*Hieraaetus morphnoides*) – not listed (EPBC Act), vulnerable (NC Act)
  - Hooded robin (*Melanodryas cucullate*) – endangered (EPBC Act), vulnerable (NC Act)
  - Painted honeyeater (*Grantiella picta*) – vulnerable (EPBC Act and NC Act)
  - Diamond firetail (*Stagonopleura guttata*) – vulnerable (EPBC Act), not listed (NC Act)
  - Southern whiteface (*Aphelocephala leucopsis*) – vulnerable (EPBC Act), not listed (NC Act)
  - Scarlet robin (*Petroica boodang*) – not listed (EPBC Act), vulnerable (NC Act)
  - Varied sittella (*Daphoenositta chrysoptera*) – not listed (EPBC Act), vulnerable (NC Act)
  - White-winged triller (*Lalage tricolor*) – not listed (EPBC Act), vulnerable (NC Act).
- Reptiles:
  - Pink-tailed worm-lizard (*Aprasia parapulchella*) – vulnerable (EPBC Act and NC Act).

- Insects:
  - Golden sun moth (*Synemon plana*) – vulnerable (EPBC Act), endangered (NC Act)
  - Perunga grasshopper (*Perunga ochracea*) – not listed (EPBC Act), endangered (NC Act).

The presence of each of these species in the Proposal Area is discussed in the following sections.

Table 5.9 Likelihood of Occurrence Assessments for Threatened Fauna Species

Species Name	EPBC Act Listing Status	NC Act Listing Status	Likelihood of Occurrence
Birds			
Southern whiteface (*Aphelocephala leucopsis*)	Vulnerable	Not listed	High / known – Potential habitat for this species exists within the Proposal Area. Species has been recorded within the Proposal Area.
Gang-gang cockatoo (*Callocephalon fimbriatum*)	Endangered	Vulnerable	Moderate – Potential habitat for this species is likely to exist within the Proposal Area. Species has been recorded within close proximity to the Proposal Area, approximately 400 metres.
Varied sittella (*Daphoenositta chrysoptera*)	Not listed	Vulnerable	Moderate – This species occurs in dry forest and woodland, which is supported in the local landscape.
Painted honeyeater (*Grantiella picta*)	Vulnerable	Vulnerable	Moderate – Potential habitat for this species may be present within the Proposal Area. The species has been recorded within close proximity to the Proposal Area, approximately 500 metres.
Little eagle (*Hieraaetus morphnoides*)	Not listed	Vulnerable	High / known – This species has been recorded within the Proposal Area.
White-throated needletail (*Hirundapus caudacutus*)	Vulnerable; migratory	Vulnerable	Moderate – This species is a non-breeding visitor to the ACT during the summer. It may use the airspace above the Proposal Area. The species has been recorded within the general vicinity to the Proposal Area.
White-winged triller (*Lalage tricolor*)	Not listed	Vulnerable	High / known – This species has been recorded within the Proposal Area. Potential habitat for this species is likely to be present within the Proposal Area.
Hooded robin (*Melanodryas cucullate*)	Endangered	Vulnerable	Moderate – Potential habitat for this species is likely to be present within the Proposal Area.
Scarlet robin (*Petroica Boodang*)	Not listed	Vulnerable	High / known – This species has been recorded within the Proposal Area. Potential habitat for this species is likely to be present within the Proposal Area.
Superb parrot *(Polytelis swainsonii*)	Vulnerable	Vulnerable	High – This species is likely to regularly disperse through the site and may occasionally forage in the Proposal Area. Potential habitat for this species exists within the area. The species has been recorded in the general vicinity of the Proposal Area.

Species Name	EPBC Act Listing Status	NC Act Listing Status	Likelihood of Occurrence
Diamond firetail (*Stagonopleura guttata*)	Vulnerable	Not listed	High / known – This species has been recorded within the Proposal Area. Potential habitat for this species is likely to be present within the Proposal Area.
Invertebrates			
Sun golden moth (*Synemon plana*)	Vulnerable	Vulnerable	Moderate – Species habitat has been recorded within the Proposal Area and while surveys undertaken by Umwelt in 2021, failed to detect the species, the surveys were undertaken in a poor season and therefore presence could not be ruled out.
Reptiles			
Pink-tailed worm-lizard (*Aprasia parapulchella*)	Vulnerable	Vulnerable	High / known – This species has been recorded within adjacent to the Proposal Area. Mapped habitat for this species is present in the Proposal Area.
Perunga grasshopper (*Perunga ochracea*)	Not listed	Endangered	Moderate – Less than 0.01 ha of potential habitat

5.3.4.1 Superb parrot

The *Polytelis swainsonii* (Superb Parrot) Conservation Advice (Superb Parrot Conservation Advice) (TSSC, 2016b) states that the superb parrot is known to use at least six species of *Eucalyptus*, including Blakely's red gum, scribbly gum (*E. rossii*) and possibly white box (*E. albens*) and yellow box (*E. melliodora*). Most nest sites are within 10 km of box gum woodland and sometimes within it, and foraging is usually within 9 km of nest sites (TSSC, 2016b). Foraging habitat includes a variety of woodlands and other habitat types, including artificial habitats such as crops and recreation reserves.

Surveys to identify potential superb parrot nesting trees were undertaken across the Direct Impact Area in November 2022 and throughout the 'superb parrot tree assessment area' (see **Figure 5.2**) in October 2023. Trees known to support superb parrot movements were also surveyed in the superb parrot tree assessment area. Criteria for identifying suitable nesting and movement trees were provided by the Conservator's office in the EIS Scoping Document (see **Appendix A**) and are replicated in **Table 5.3**.

No potential superb parrot nesting trees were recorded in the Direct Impact Area or in close proximity to the new alignments (10–15 m depending on the species) where they would require canopy reduction to comply with canopy height restrictions beneath transmission lines. These trees are shown on **Figure 5.2**.

Eucalyptus and *Acacia* species recorded in the Proposal Area provide suitable superb parrot foraging habitat. As the species is also known to feed on native grass seed, it is likely that the superb parrot may also use the open grassland areas within the Proposal Area for foraging. As such, all native vegetation within the Direct Impact Area is considered potential foraging habitat for the superb parrot (4.91 ha).

All mature and hollow-bearing trees in the Proposal Area and surrounding landscape are considered to contribute to connecting habitat for the superb parrot, especially noting the proximity of the Proposal Area to known breeding habitat within the Molonglo Valley.

Seventeen trees within the superb parrot tree assessment area were confirmed to be within the height range (10–15 m) identified as critical for superb parrot movement. Of these, three are within the Direct Impact Area and six are less than 10 m from the Direct Impact Area.

Targeted surveys were undertaken for superb parrot during the 2022 breeding season at locations with potential nesting trees in the new alignment corridors. The species was not recorded during these surveys.

5.3.4.2 Gang-gang cockatoo

Gang-gang cockatoo primarily occurs within the temperate eucalypt forests and woodlands of mainland southeast Australia and is an altitudinal migrant. During summer months the species inhabits mature wet sclerophyll forests dominated by eucalypts, and in the winter months it ranges beyond montane forests to inhabit woodland assemblages at lower, drier altitudes (DAWE, 2022). Gang-gang cockatoo has a wide-ranging diet, with mainly arboreal foraging in the canopy of woodland assemblages. Old growth forest and woodland assemblages are favourable for nesting, loafing and roosting. The species nests in the hollows of tree trunks and limbs. Nesting and roosting sites are often near water, where larger hollow-bearing trees can be more common.

Surveys to identify potential gang-gang cockatoo nesting or foraging trees were undertaken across the Direct Impact Area in November 2022 and October 2023. Criteria for identifying potential nesting and foraging trees were taken from Davey and Mulvaney (2020), as detailed in **Table 5.3**.

The ACT Government is undertaking extensive research into the tree characteristics that make a tree suitable for gang-gang cockatoo nesting. This research has not been made publicly available and has not been provided to Umwelt or the GJV as part of the Proposal. However, in April-May 2024, an ACT Government ecologist undertook a ground-based survey of the potential gang-gang cockatoo breeding trees identified by Umwelt in 2022 and 2023, to confirm whether they satisfy the new criteria for gang-gang cockatoo nesting trees. This was followed by a second survey with the same ecologist and an independent arborist in July 2024, who did detailed surveys (e.g. measuring the hollow dimensions) to confirm definitively whether the trees are suitable for nesting.

As Umwelt's initial assessment used more conservative criteria, it resulted in an over-estimation of the number of potential breeding trees that would be impacted by the Proposal. This was refined following the ACT Government and arborist surveys.

Six potential gang-gang cockatoo foraging trees were recorded within the Direct Impact Area, one of which is also a potential nesting tree. An additional 10 potential foraging trees were recorded within close proximity to the Impact Area (10–15 m depending on tree species), one of which is also a potential nesting tree. These trees are shown on **Figure 5.2**.

Targeted surveys were undertaken for gang-gang cockatoo during the 2022 breeding season at locations with potential nesting trees in the new alignment corridors. Five individuals were recorded to the west of the Murrumbidgee River in the river corridor, at a location dominated by red stringybark (*Eucalyptus macrorhyncha*) (see **Figure 5.7**). They formed part of a group and were an incidental sighting, not recorded as part of targeted surveys. The sighting was not within the Direct Impact Area, but it indicates that the species uses the landscape around the Proposal.

5.3.4.3 Little eagle

The Conservation Advice for Little Eagle (*Hieraaetus morphnoides*) (Scientific Committee, 2019a) states that the little eagle nests in open woodland (usually on hillsides) and along tree-lined watercourses, with the nest typically placed in a mature, living tree. It is a fast, agile hunter that takes live prey by swooping from either elevated perches or while soaring (Scientific Committee, 2019a). Sightings of the little eagle have been recorded across much of the ACT, but the breeding range is in the lower elevation areas of the ACT in the north, with the highest concentrations in the Murrumbidgee and Molonglo River corridors (Scientific Committee, 2019a).

Potential little eagle breeding and foraging habitat is present in the landscape surrounding the Proposal, with known breeding activity and tracking data from the ACT Government demonstrating that it feeds within local woodland and grassland (including derived grassland) communities in the local area (J. Hopkins pers. comm. 30 August 2023). In addition, the species is known to breed at two locations near the Proposal Area (approximately 2 km northeast of Strathnairn and at 'Lands End' just west of William Hovell Drive).

In the ACT the species most commonly preys on rabbit, with birds (parrots and small passerines <500 g), insects (such as Christmas beetles and cicadas) and reptiles also forming part of their diet. They are also known to take carrion. However, the quality of vegetation is less important compared to the presence of habitat features for prey species (Scientific Committee, 2019a). Based on this, it is considered highly likely that the species uses the entire Proposal Area for foraging, and no targeted surveys were undertaken for the species.

5.3.4.4 Other Threatened Woodland Bird Species

Areas of woodland and open forest considered habitat for woodland birds as per the EIS Scoping Document (**Appendix A**) were mapped as part of the vegetation assessment for the BAR. An assessment of the presence of habitat features was also undertaken, including features such as shrubs, fallen logs and other coarse woody debris. The Proposal Area supports remnant mature native tree species that provide woodland birds with foraging and breeding habitat and movement corridors. Seven woodland bird species listed as threatened under the EPBC Act and/or NC Act were identified as having moderate or high likelihood of occurrence within the Proposal Area, including hooded robin, painted honeyeater, diamond firetail, southern whiteface, scarlet robin, varied sittella and white-winged triller.

These woodland bird species all use a mix of woodland and open forest and grassland areas (including scattered trees) for breeding and/or foraging. While open grassland areas are not used for breeding, they provide important foraging habitat, including during breeding periods. Many of the species including diamond firetail and southern whiteface feed almost exclusively on the ground in areas of open grassland or favouring areas with low tree densities (Antos, Bennett, & White, 2008) (Read, 1994).

A total of 4.91 ha of potential habitat including box gum woodland, grasslands and open forest in the Direct Impact Area would provide foraging and breeding habitat for woodland birds (see **Figure 5.1**). The Proposal Area also contains the exotic sweet briar (*Rosa rubiginosa*) and other native and exotic grass species which are likely to provide foraging and breeding resources for these threatened bird species.

No targeted surveys were undertaken for threatened woodland birds, but any incidental sightings during other field surveys were recorded and used to inform the impact assessment in **Section 5.4.4.4**.
The following subsections provide detail about the potential occurrence of the ten threatened woodland bird species in the Proposal Area.

Hooded robin

Hooded robin has shown a consistent steady decline over recent decades in the ACT (Bounds, Davey, Taws, Evans, & Rayner, 2021) and is now in very low abundance in the Canberra region and has been lost from peri-urban woodland sites. Surveys conducted as part of the Woodland Bird Monitoring Project by the Canberra Ornithologists Group (COG) have not recorded the species in surveys since 2014 (Bounds, Davey, Taws, Evans, & Rayner, 2021). The species was not recorded during surveys in the Proposal Area.

Painted honeyeater

Painted honeyeater is sparsely distributed from the eastern Northern Territory and north-western Queensland through to south-eastern Australia, predominantly on or west of the Great Dividing Range. The species is thought to be migratory, breeding in the southern part of its range in the spring and summer before dispersing north during the non-breeding season. It is also considered as being partly nomadic in parts of its range, with movements driven by the abundance of feeding resources (Watson, et al., 2021).

Painted honeyeater inhabits a range of woodlands and shrublands, particularly weeping myall (*Acacia pendula*), brigalow (*A. harpophylla*), box gum woodland, and box-ironbark forests that support a high density of mistletoe, particularly of the genus *Amyema* (Scientific Committee, 2019b). The species appears to prefer mistletoe as a nest substrate and selects nest sites in habitats where mistletoe prevalence and parasitism rates are high (Barea, 2008).

In the ACT, painted honeyeater may visit for short periods over late spring and summer and is considered a rare breeding visitor to the region (COG, 2018). Observations have been sporadic and widespread across the ACT. Records of individuals being recorded in Stony Creek Nature Reserve and Uriarra during 2013–2014 are the nearest observations to the Proposal Area (Scientific Committee, 2019b). The species was not recorded during surveys in the Proposal Area.

Diamond firetail

In the ACT, diamond firetail is considered an uncommon breeding resident and occurs infrequently at a small number of locations. In the ACT Woodland Bird Monitoring Project, the species showed no overall trend in reporting rate from 1998–2019, however, a significant decrease in reporting rate was noted from 2012 to 2017, corresponding with the end of a wetter period and start of a drier period (Bounds, Davey, Taws, Evans, & Rayner, 2021).

The clearing of native vegetation is the primary reason for the decline of the diamond firetail (Hodder, et al., 2021), and the replacement of native perennial grasses with exotic annual grasses has led to widespread degradation of remaining habitat (Ford, 2011).

No individuals were recorded utilising the habitat during surveys conducted across the Proposal Area, however they have previously been recorded in the immediate vicinity at the eastern end of the new alignments.

Southern whiteface

In the ACT, southern whiteface is considered an uncommon breeding resident as it now occurs in very low numbers at a small number of locations. In the ACT Woodland Bird Monitoring Project, the species showed a small decline in reporting rate from 1998–2019 with a significant decline in the period 2009–2014 (Bounds, Davey, Taws, Evans, & Rayner, 2021).

Two individuals were observed together near the western end of the new alignments but outside of the Direct Impact Area (see **Figure 5.7**).

Scarlet robin

The Direct Impact Area includes potential grassy woodland that may provide foraging habitat for scarlet robin, however, the species has not previously been recorded from the vicinity of the Proposal Area. Given the large distribution of the sub-species and the minimal extent of habitat in the Direct Impact Area, it is unlikely that the species is utilising the Proposal Area.

Varied sittella

Varied sittella has not been recorded from the vicinity of the Proposal Area. Given the large distribution of the sub-species and the minimal extent of habitat in the Direct Impact Area, it is unlikely that the species is utilising the Proposal Area.

White-winged triller

White-winged triller occurs in woodlands and forests, open scrub and tree lined waterways with a light grassy groundcover. It is found all over the Australian mainland, migrating to southern Australia in summer for breeding and wintering in northern and inland Australia.

One white-winger triller was observed in the new alignment corridor near the LMWQCC (see **Figure 5.7**).

5.3.4.5 Pink-tailed worm-lizard

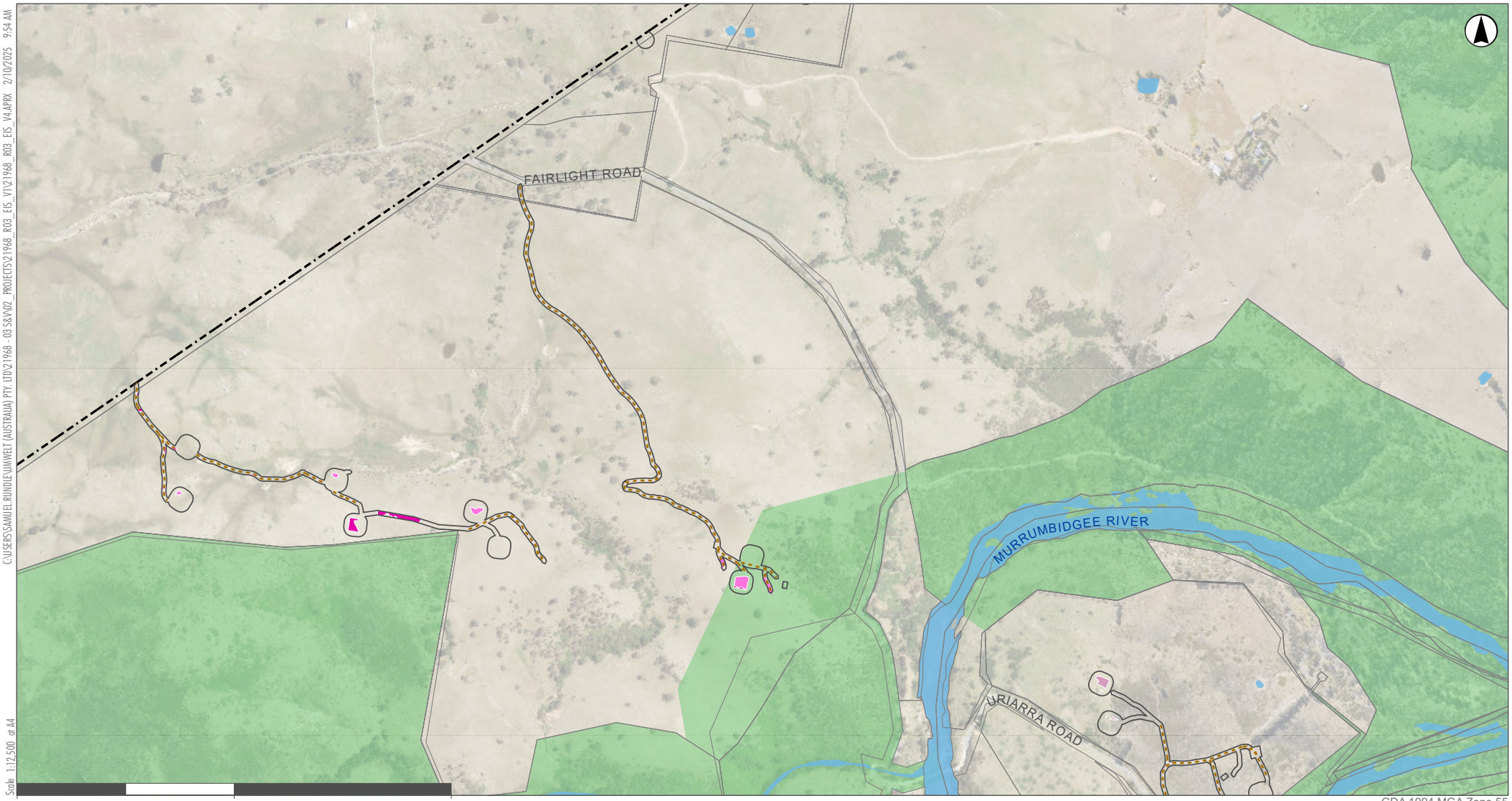
PTWL is a small worm-like legless lizard that occurs in rocky habitats, with a low population density except in the most favourable habitats. It is typically associated with rocky areas within natural temperate grassland, but also occurs in rocky areas within open grassy woodland and grassland derived from cleared woodland. In the ACT, PTWL has a patchy distribution along the slopes of the Molonglo and Murrumbidgee River corridors and on adjacent outlying hills.

Habitat mapping was undertaken for PTWL in August 2023. A total of 1.09 ha of potential habitat for PTWL habitat was identified within the Direct Impact Area, across 20 patches of surface rocks (see **Figure 5.8**). As shown in **Table 5.10**, the majority of this (0.56 ha) was classified as moderate quality habitat, with 0.29 ha of higher quality habitat and 0.24 ha of lower quality habitat present.

Targeted surveys were not undertaken for PTWL as the species is known to occur in the Proposal Area and surrounding landscape. Presence has been assumed for the purposes of this EIS.

Table 5.10 Potential Habitat for pink-tailed worm-lizard in the Direct Impact Area

Habitat Quality	Number of patches	Total extent (ha)
High	3	0.15
Moderate-high (patch predominantly moderate habitat with some high quality habitat)	1	0.14
Moderate	10	0.56
Moderate-low (patch predominantly moderate with some low quality habitat)	1	0.04
Low	5	0.2
Total	**20**	**1.09**



Legend

- Access Tracks - Existing
- Direct Impact Area
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Existing Substation

Potential Pink-tailed Worm-lizard Habitat

- High
- Moderate
- Low
- Nil

FIGURE 5.8A

Potential Pink-tailed Worm-lizard Habitat in the Direct Impact Area

Image Source: Nearmap (2023) **Data source:** ACT Government (2023)

Legend

- Access Tracks - Existing
- Direct Impact Area
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Existing Substation

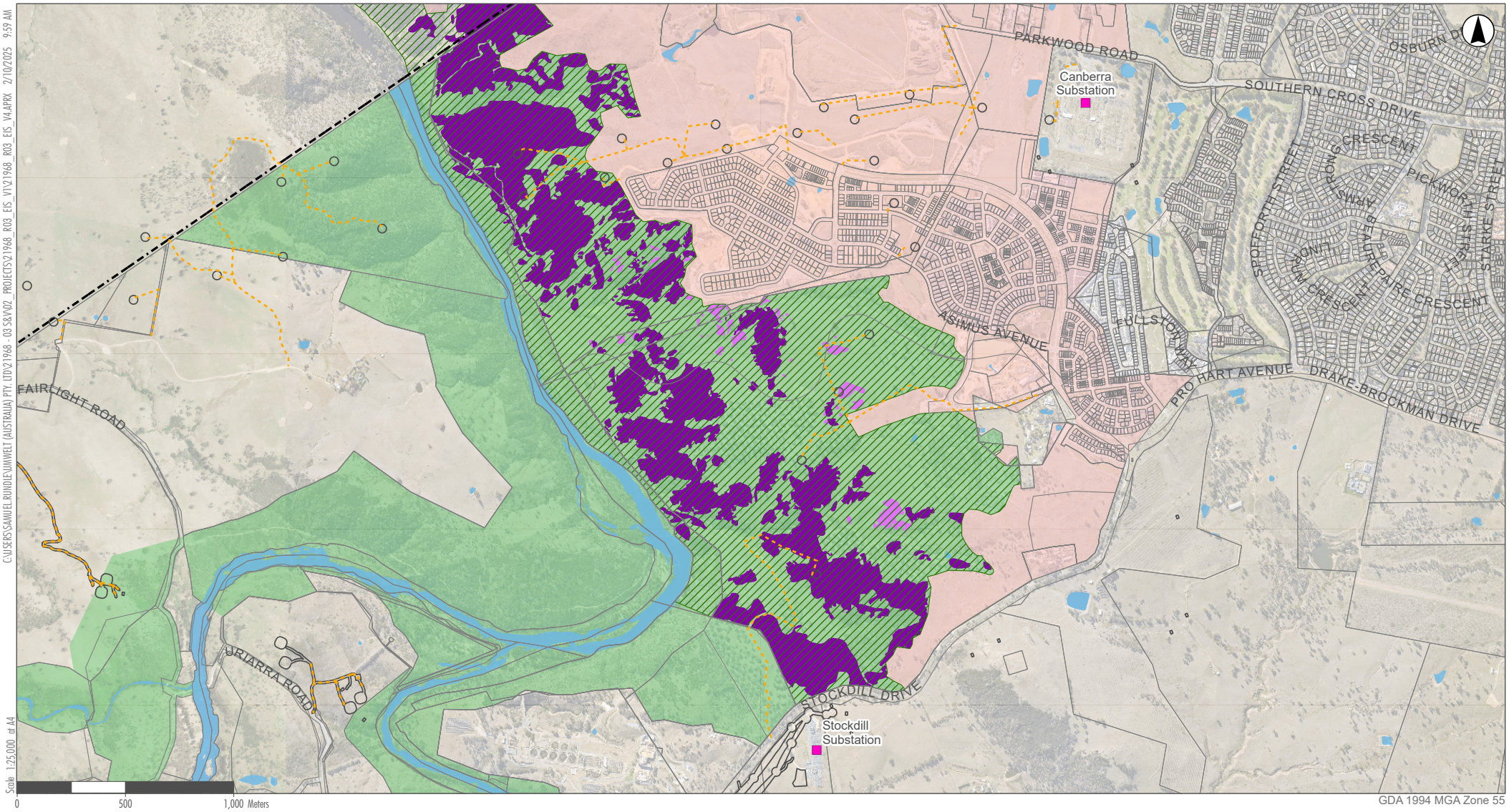
Potential Pink-tailed Worm-lizard Habitat

- High
- Moderate
- Low
- Nil

FIGURE 5.8B

Potential Pink-tailed Worm-lizard Habitat in the Direct Impact Area

Image Source: Nearmap (2023) **Data source:** ACT Government (2023)



Legend

- Access Tracks - Existing
- Direct Impact Area
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Existing Substation

Suitable Pink-tailed Worm-lizard Habitat (Capital Ecology)

- High Quality Habitat Conservation Area
- Low Quality Habitat Conservation Area

FIGURE 5.8C

Suitable Pink-tailed Worm-lizard Habitat in Demolition Area

Image Source: Nearmap (2023) **Data source:** ACT Government (2023)

5.3.4.6 Golden sun moth

The *Synemon plana* (Golden Sun Moth) Conservation Advice (GSM Conservation Advice) (DAWE, 2021a) states that the GSM distribution shows a close correlation to that of native temperate grasslands dominated by wallaby grasses (*Rytidosperma* spp.). Sites where GSM are found are generally flat or gently sloping and exposed to full sun.

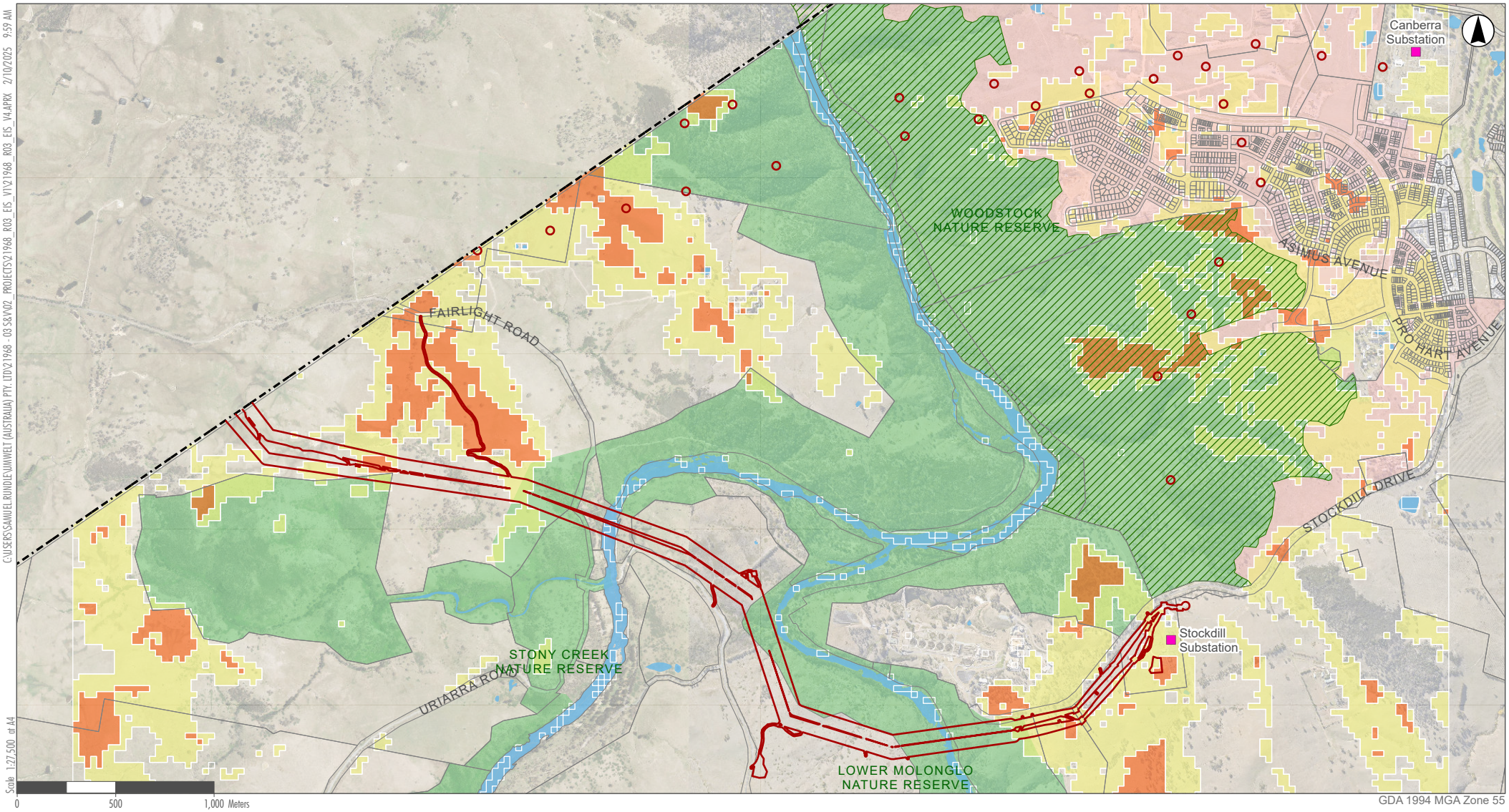
The Conservator provided the Proposal team with preliminary data showing modelled habitat extent for GSM and for GSM females more specifically. The "All GSM" model (**Figure 5.9**) was developed from sightings of GSM, and the "Female GSM" model (**Figure 5.10**) from sightings of females (noting that there are no public records of GSM occurring in the Proposal Area or surrounding landscape on the ALA or NatureMapr). The Conservator's office stated that it treats habitat where females occur as highest priority for protection. This dataset is not yet publicly available, but the Conservator's office stated that test statistics have revealed that the predictive power of the models was strong.

The Conservator requested that targeted GSM surveys be undertaken where potential habitat is confirmed within the areas identified by their modelling. As shown in **Figure 5.11**, potential habitat was confirmed to be present in the western and eastern ends of the new alignments. The majority of the confirmed habitat was classified as low quality (3.29 ha) and was located near the NSW border, with moderate quality habitat (0.47 ha) also near the NSW border and high quality habitat (0.33 ha) limited to the eastern end near the Stockdill Substation.

Targeted GSM surveys were conducted in these areas of potential habitat in November 2023. Targeted surveys had also been undertaken throughout an older alignment corridor in December 2021. The species was not recorded during any of these surveys.

Table 5.11 Potential Habitat for golden sun moth in the Direct Impact Area

Habitat Quality	Extent (ha)
High	0.33
Moderate	0.47
Low	3.29
Total	**4.09**



Legend

- Proposal Area
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Existing Substation

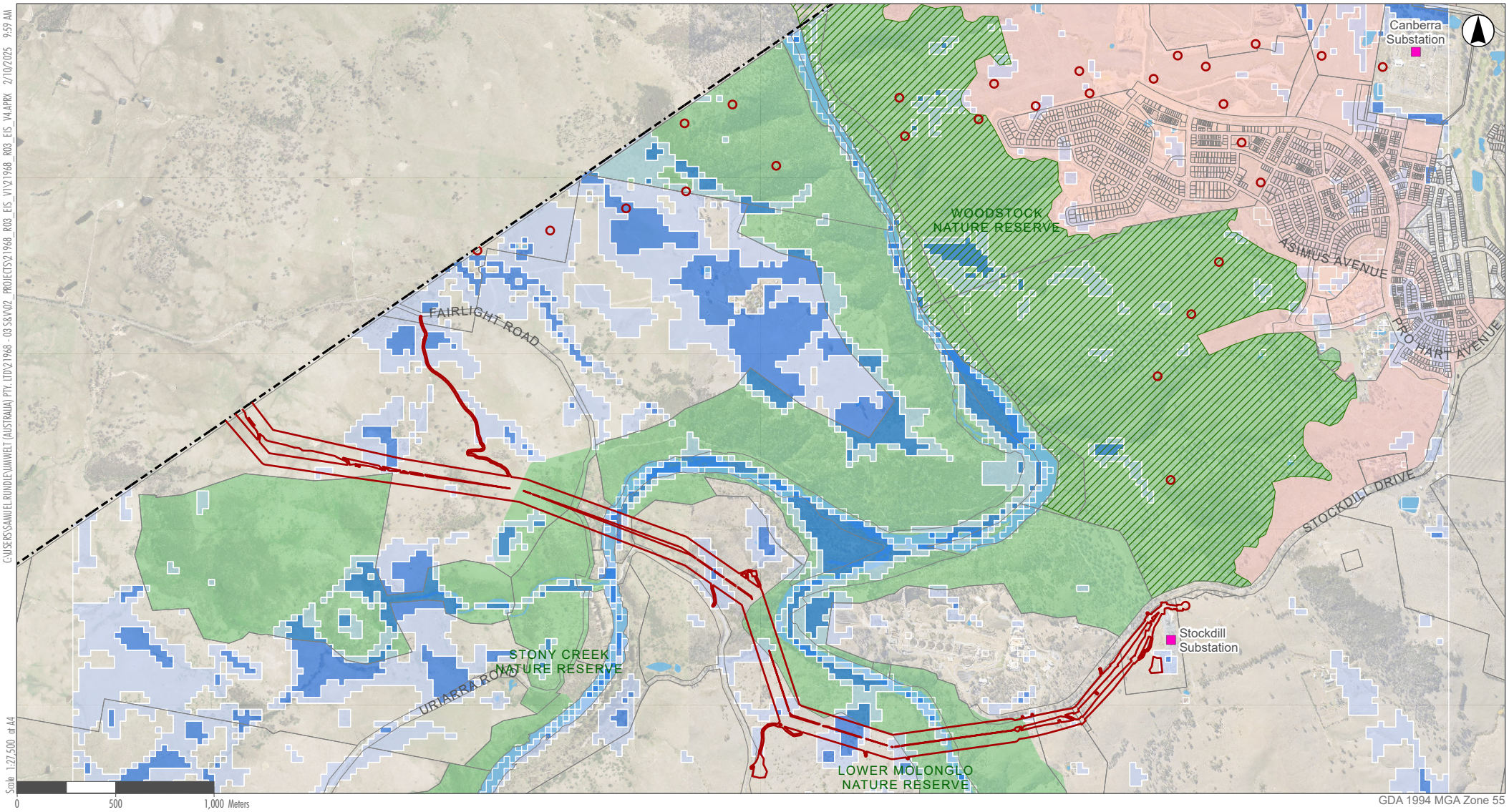
Probability of Suitable Golden Sun Moth Habitat

- 50-70%
- >70%

FIGURE 5.9

Predictive Modelling of Golden Sun Moth Habitat Extent (provided by ACT Government)

Image Source: Nearmap (2023) **Data source:** ACT Government (2023)



Legend

- Proposal Area
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Existing Substation

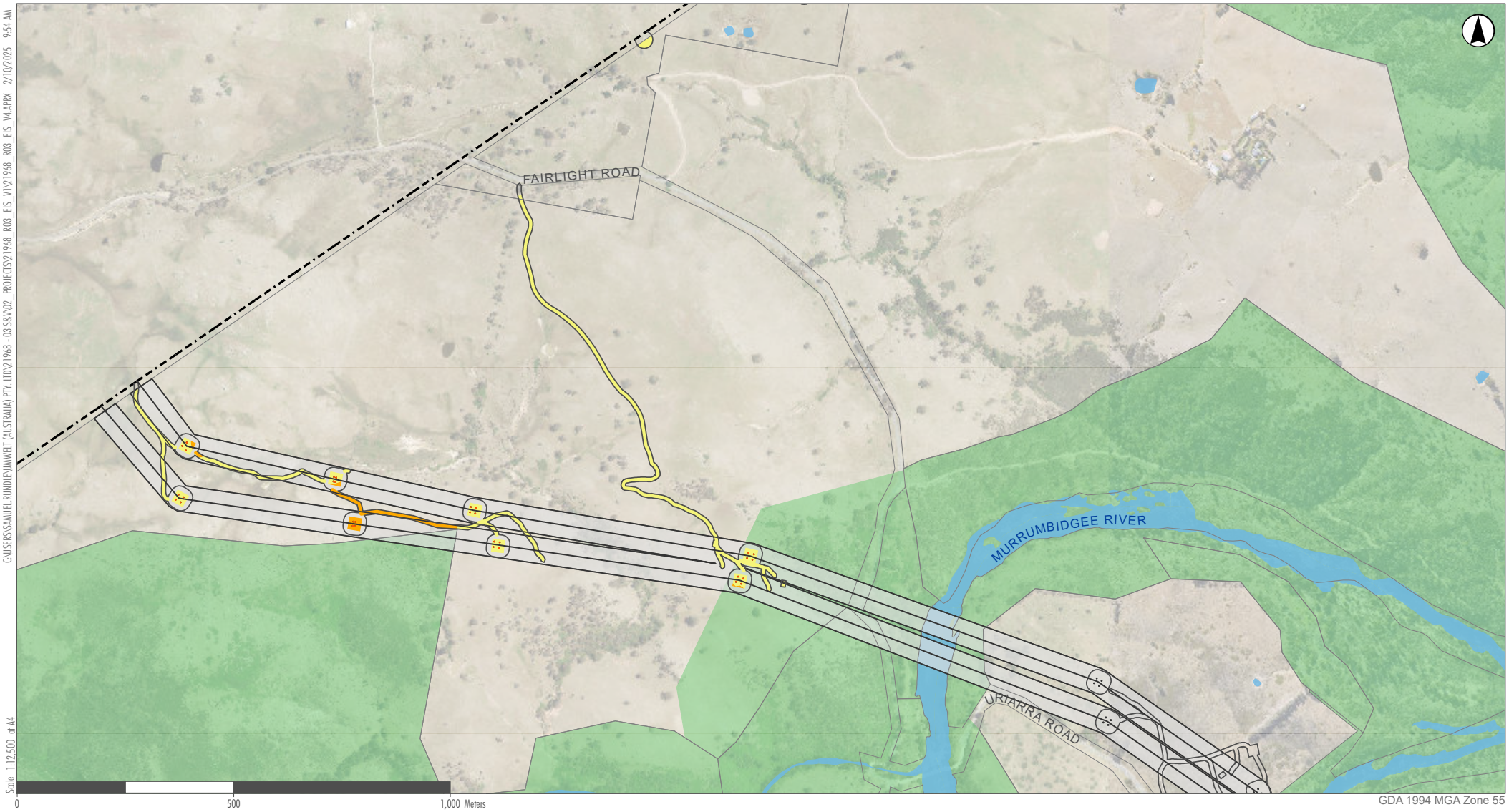
Probability of Female Suitable Golden Sun Moth Habitat

- 50-70%
- >70%

FIGURE 5.10

Predictive Modelling of Female Golden Sun Moth Habitat Extent (provided by ACT Government)

Image Source: Nearmap (2023) **Data source:** ACT Government (2023)



Legend

- New Alignment
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Direct Impact Area

Potential Golden Sun Moth Habitat

- High
- Moderate
- Low

FIGURE 5.11A

Potential Golden Sun Moth Habitat in the Direct Impact Area

Image Source: Nearmap (2023) **Data source:** ACT Government (2023)

Legend

- Existing Substation
- New Alignment
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Direct Impact Area

Potential Golden Sun Moth Habitat

- High
- Moderate
- Low

FIGURE 5.11B

Potential Golden Sun Moth Habitat in the Direct Impact Area

Image Source: Nearmap (2023) **Data source:** ACT Government (2023)

5.3.4.7 Perunga grasshopper

Perunga grasshopper is found in natural temperate grassland dominated by wallaby grasses (*Rytidosperma* spp.), spear grasses (*Austrostipa* sp.) or kangaroo grass (*Themeda triandra*), and in other native grasslands. Field observations suggest that the species uses grass tussocks as shelter spaces and that it prefers sites containing vegetation mosaics with tall tussock grasses, shorter grasses and forbs, and bare ground. The species has however, also been recorded in heavily grazed habitats, where the availability of dense grass tussocks was low (ACT Government, 2017a).

Perunga grasshopper is hard to detect and monitor, and there is limited knowledge about the distribution and abundance of the species and its ecology and biology (ACT Government, 2017a). Targeted surveys are generally not recommended for the species due to the difficulty of systematic detection of the species. As such, the perunga grasshopper assessment was based on habitat mapping rather than targeted survey.

Based on this information, areas of native grassland (including derived grasslands) that are dominated by wallaby grasses, spear grasses or kangaroo grass in the Direct Impact Area are considered habitat for perunga grasshopper. Only ACT01.1, ACT16.4 and ACT16.5 meet this criterion. There is therefore 2.28 ha of potential perunga grasshopper habitat in the Direct Impact Area (see **Figure 5.12**).

5.3.5 Migratory Birds

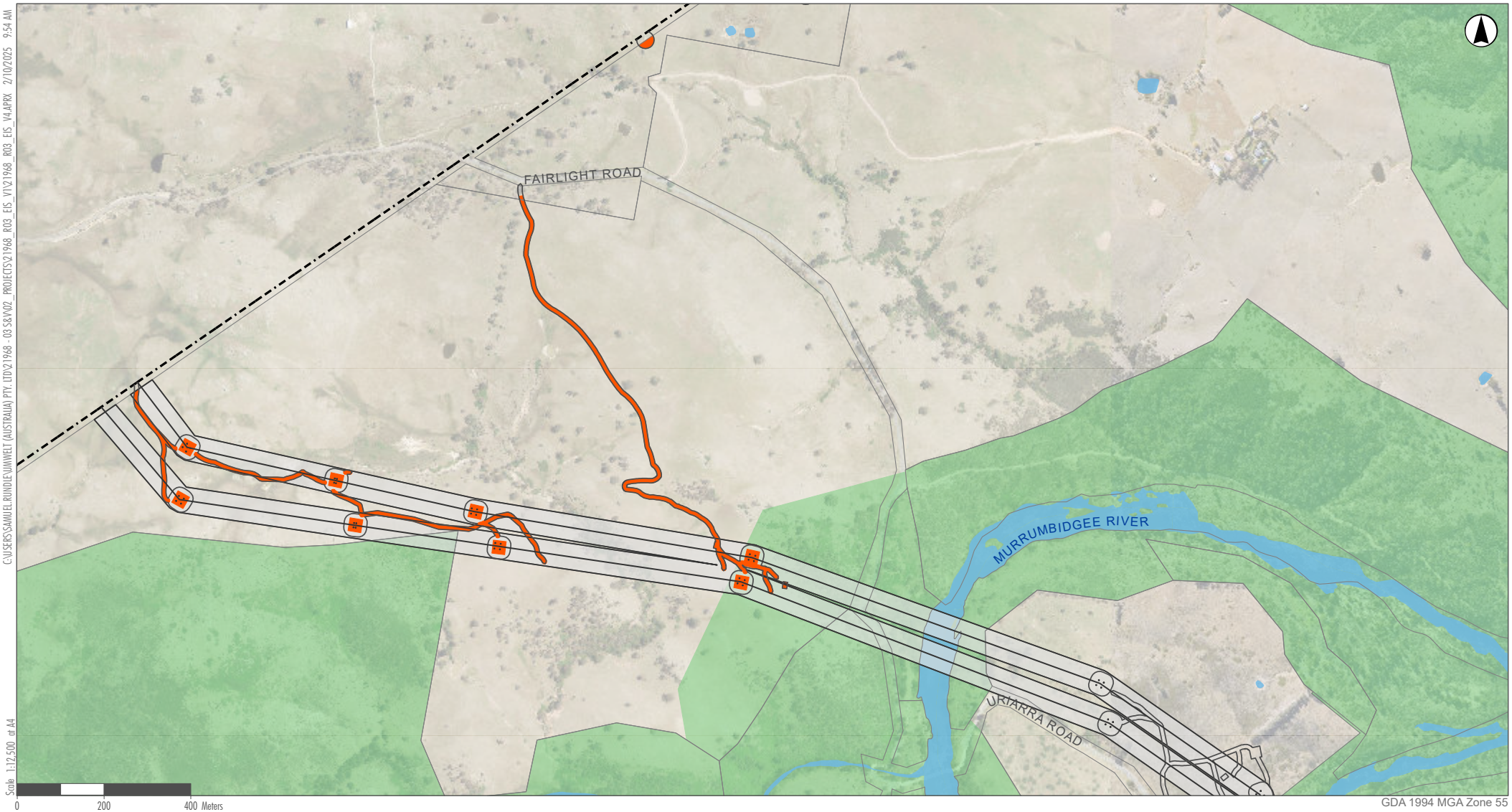
The EPBC Act Protected Matters Search (**Appendix A** to **Appendix G1**) identified 13 migratory species as potentially occurring within 10 km of the Proposal Area. Only one migratory species (white-throated needletail (*Hirundapus caudacutus*)) was determined to have a moderate likelihood of occurrence in the Proposal Area. All other migratory species have a low likelihood of occurrence, other than to potentially utilise the airspace above the Proposal. These species have therefore not been assessed further in this EIS.

White-throated needletail is listed as vulnerable as well as migratory under the EPBC Act. Due to the aerial and highly mobile nature of the species, it is considered unlikely that it would interact with habitat in the Proposal Area and therefore no further assessment of direct impacts on white-throated needletail has been undertaken in this EIS. Indirect impacts relating to collision risk with overhead powerlines have been considered in **Section 5.4.6.6**.

The EIS Scoping Document (**Appendix A**) requires that impacts on migratory species such as rainbow bee-eater (*Merops ornatus*) be considered. Rainbow bee-eater is no longer listed under the EPBC Act as a migratory species and is not listed as threatened under either the EPBC Act or NC Act. However, for completeness, and to address the Scoping Document, rainbow bee-eater has been considered below.

Rainbow bee-eater is found in a variety of habitats including open forests and woodlands, shrublands, and in various cleared or semi-cleared habitats, including farmland and roadside vegetation. Breeding habitat features for the species include sandy riverbanks, creeks, dams, or roadside cuttings. Due to the position of the Proposal, none of these features will be present in the Direct Impact Area and no assessment of breeding habitat has been undertaken.

The species usually forages from open perches, from where it may scan for prey (e.g. flying insects), but it has also been known to forage from the ground (DCCEEW, 2024b). As an insectivorous species, it is considered that the presence of rainbow bee-eater foraging habitat is widespread throughout the Proposal Area and a further assessment of foraging habitat has not been undertaken. Potential impacts have been considered in **Section 5.4.5**.



Legend

- New Alignments
- Direct Impact Area
- Potential Perunga Grasshopper Habitat
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Existing Substation

FIGURE 5.12A

Potential Perunga Grasshopper Habitat in the Direct Impact Area

Image Source: Nearmap (2023) **Data source:** ACT Government (2023)

C:\USERS\SAMUEL.RUNDLE\UMWELT (AUSTRALIA) PTY. LTD\21968 - 03 S&V\02_PROJECTS\21968_R03_EIS_V1\21968_R03_EIS_V4.APRX 2/10/2025 9:54 AM

Scale: 1:12,500 at A4

Legend

- New Alignments
- Direct Impact Area
- Potential Perunga Grasshopper Habitat
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Existing Substation

FIGURE 5.12B

Potential Perunga Grasshopper Habitat in the Direct Impact Area

Image Source: Nearmap (2023) **Data source:** ACT Government (2023)

5.3.6 Native Burrowing Animals

The Scoping Document (**Appendix A**) requires that native burrowing animals be considered in the EIS. This was clarified to relate to species such as common wombat (*Vombatus ursinus*) and rakali (*Hydromys chrysogaster*).

Habitat for the common wombat includes temperate forests and grasslands that are widespread in south-eastern Australia, including the eastern parts of New South Wales and Victoria, western and north-eastern ACT and all of Tasmania. Its distribution depends on the availability of burrowing sites located near food sources, but the species is known to travel several kilometres to visit certain sites with short grass. It grazes on coarse native grasses, sedges, rushes, succulent plant roots and tubers, and pasture grasses. Due to the vast habitat range and abundance of food sources available, no assessment of habitat has been undertaken within the Impact Area and the Proposal is not expected to impact the species.

Rakali is distributed throughout Australia and has habitat burrows on the embankments of permanent waterbodies. It prefers low banks with flat and dense vegetation near the water edge. The home range varies between 1 and 4 km from a waterway. The rakali has a varied diet including fish, aquatic insects, aquatic plants, crayfish, clams, mussels, crabs, frogs, turtles and sometimes water birds and their eggs. It breeds within its home range and nests in burrows, sunken logs and reeds. Due to the position of the Proposal, none of these features will be present in the Direct Impact Area and the Proposal is not expected to impact the species.

5.4 Potential Impacts

Potential biodiversity impacts of the Proposal, as identified in the risk assessment in **Section 4.2** and summarised in **Section 5.1**, include:

- Unanticipated ecological impacts due to TECs, threatened species habitat or other protected matters (e.g. native vegetation) not being identified prior to the Proposal design being finalised.
- Ecological impacts caused by construction activities that involve the clearance of native vegetation including TECs and/or habitat for threatened species.
- Disturbance, injury or death of fauna from construction activities.
- Vegetation clearance or modification outside the approved disturbance area due to unclear demarcation of boundaries.
- Loss of connectivity or increased fragmentation of the landscape for threatened fauna caused by vegetation clearance.
- Off-site spread of invasive species caused by land disturbance during construction.
- Indirect ecological impacts associated with noise, vibration, lighting, waste, dust or erosion and sedimentation.

These potential impacts may also contribute to cumulative environmental impacts in the region resulting from the Proposal and other similar, nearby developments.

Other risks associated with biodiversity relate to biodiversity offsets, specifically the availability of offsets and ongoing compliance and delivery of offset commitments, should an offset be required.

These potential impacts are discussed in detail below.

5.4.1 Native Vegetation

As shown in **Figure 5.1**, 4.91 ha of native vegetation, as defined under the NC Act, occurs within the Direct Impact Area and would be cleared or modified as part of the Proposal.

Six mature Blakely's red gum trees were recorded within the Direct Impact Area, each above 6 m in height (the maximum height permitted under operating powerlines), which would need to be removed. An additional 10 trees would be modified (lopped) to comply with canopy height restrictions. For the purpose of this assessment, all Blakely's red gum trees within 10 m and all yellow box trees within 15 m of the vegetation clearance zone (as defined in the operational footprint in **Table 2.1**) were included in the loss calculations, based on the lifeform of these species (see **Figure 5.2**).

This vegetation clearance is consistent with the NC Act listed 'loss of mature native trees (including hollow-bearing trees) and a lack of recruitment' threatening process (Scientific Committee, 2018).

5.4.1.1 Habitat Connectivity

The Proposal would lead to the loss of up to 0.08 ha of box gum woodland that supports canopy trees (i.e. ACT16.1). In total, six trees would be permanently removed, and a further 10 are likely to require modification to maintain the standards required under overhead powerlines. This impact is restricted to the eastern end of the new alignments, east of the Molonglo River, where the transmission lines are closest to the ground and located near woodland along the verge of Stockdill Road (see **Figure 5.2**).

The Proposal has been designed to minimise impacts on native vegetation (with particular focus on minimising impacts on mature and hollow-bearing trees). The Proposal would therefore have minimal impacts on tree and tree-canopy connectivity, particularly since it would not impact any trees within areas of highest connectivity value (i.e. along riparian corridors).

The trees to be removed are in an area of low connectivity value for forest and woodland birds and moderate connectivity value for generalist species (see **Figure 5.4**, **Figure 5.5**, and **Figure 5.3**, respectively).

The majority of box gum woodland that would be impacted is in a derived form, with impacts to occur in small patches distributed along the new alignments (see **Figure 5.6**). Regeneration is also absent in the majority of the impact areas, as such, regenerating trees would not need to be removed within the easement. It is considered unlikely that the Proposal would fragment or increase fragmentation of habitat within the Proposal Area.

Transmission lines do not create substantial barriers to movement within grassland habitats, with impacts being limited to tower locations, and the aerial conductors between. In grassland habitat, such as the majority of the Proposal Area, vegetation will not require management within the easement. Substantial effort has been made in design to avoid clearance of trees, including large spans over the river corridors to avoid vegetation clearance, and breaks in connectivity along these important connections. For the box gum woodland present within the Proposal Area, connectivity would not be impacted in a significant way.

5.4.2 Threatened Ecological Communities

5.4.2.1 Box gum woodland

A total of 2.37 ha across 11 areas of BGW is present within the Direct Impact Area and would be directly impacted by the Proposal (see **Figure 5.6**). The majority (2.29 ha) is in the derived state, of which 2.27 ha is low quality.

Assessing the significance of the Proposal's impact to BGW has considered the definitions of a significant impact under both the EPBC Act, and the PD Act, in taking into account the nature and magnitude of potential impacts, including:

- the sensitivity, resilience and rarity of the environment which will be impacted
- the kind, size, duration and frequency of the action and its impacts
- all direct and indirect impacts
- existing levels of impact from other sources (refer **Section 5.5**).

Table 5.12 Considerations for Significance - BGW

Consideration	Response
The sensitivity, resilience and rarity of the environment which will be impacted	The patches of BGW form part of, and are on the edge of, a much larger patch of woodland and derived native grassland in the broader landscape, which includes areas protected in the Woodstock and Molonglo River Nature Reserves. This is illustrated in Figure 4.1 of Appendix G01. It is not considered rare in the local environment. Substantial effort has been made during design development to avoid areas of higher quality BGW, particularly areas with a tree component and regeneration present, to minimise the requirement for tree removal and impact on connectivity. BGW being impacted is located within an environment that is largely rural land. It exhibits a history of land clearing, and is managed for agricultural purposes, subject to stock grazing, and vehicle access. It is not considered highly sensitive due to the existing land use.
The kind, size, duration and frequency of the action and its impacts	The impacts will be discreet within the landscape, with construction to be short term in nature, completed within a matter of months. Once operational, management of the easement would include regular but infrequent trimming of trees over 6m tall, and inspections of towers. Existing access tracks or drones would be utilised.
All direct and indirect impacts	2.37 ha of BGW across 11 areas would be impacted directly by the Proposal. This includes construction of towers, and access tracks. Within BGW, six trees would be permanently removed, and a further 10 would require modification. Concrete footings for towers, once constructed will be approximately 2.5m in diameter, with 4 at each tower location. Native grass can be reseeded directly up to the concrete footings. The impact areas assessed are conservative, to ensure all erosion and sediment control, laydown areas, etc are adequately captured. Indirect impacts including the potential for the spread of weeds, would be appropriately managed through the CEMP commitments.

A significant impact assessment was undertaken for BGW in accordance with the Significant Impact Guidelines (Department of the Environment, 2013), and the considerations above. As shown in **Table 5.13**, the assessment concluded that the Proposal does not meet the significant impact criteria for BGW, and would not have a significant impact on the TEC, as the extent of reduction of BGW is minimal in the context of the broader extent of the TEC, especially noting that it is distributed across 11 areas within the Direct Impact Area and mostly in a derived state.

As such, it is considered unlikely that the Proposal would have a significant impact on the EPBC Act and NC Act listed BGW TEC. The Commonwealth assessed the Proposal and confirmed that the Proposal would not have a significant impact on the critically endangered ecological community.

Table 5.13 Significant Impact Assessment for White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:	
Reduce the extent of an ecological community	**Yes**. The Proposal would result in the loss of 2.37 ha of native vegetation across 11 areas that meets the condition thresholds for the White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland critically endangered ecological community (mainly in the east and western ends of the new alignments). The majority (2.29 ha) is in the derived state, with 0.02 ha supporting a high quality understorey with multiple important species. All zones were assessed as Class B due to the sparse cover (or absence) of canopy species. While the Proposal has been positioned to avoid areas of BGW where possible (including areas supporting mature and hollow-bearing trees), six trees would be permanently removed, and a further 10 would require modification (canopy reduction) to maintain standards required under overhead powerlines. This impact is restricted to the eastern end of the new alignments where the powerlines would be closest to the ground to connect into the Stockdill Substation. The patches of BGW that would be impacted form part of and are on the edge of a much larger patch of woodland and derived native grassland in the broader landscape, which includes areas protected in the Woodstock and Molonglo River Nature Reserves. The reduction in extent of 2.37 ha of BGW caused by the Proposal is minimal in the context of the wide distribution of BGW within the surrounding landscape, especially noting that the impacted BGW is made up of many small, dispersed patches, mostly in a low quality, derived state.
Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	**No**. The Proposal would result in the loss of 2.37 ha of native vegetation across 11 areas that meets the condition thresholds for the White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland critically endangered ecological community (mainly in the eastern and western ends of the new alignments). While the Proposal has been positioned to avoid areas of BGW where possible (including areas supporting mature and hollow-bearing trees), six trees would be permanently removed, and a further 10 would require modification modified (canopy reduction) to maintain standards required under overhead powerlines. This impact is restricted to the eastern end of the new alignments where the powerlines would be closest to the ground. The impacted patches of BGW form part of and are on the edge of a much larger patch of woodland and derived native grassland in the broader landscape, which includes areas protected in the Woodstock and Molonglo River Nature Reserves. Due to the small loss of BGW caused by the Proposal (2.37 ha) relative to the wide distribution of BGW within the surrounding landscape, the Proposal is considered unlikely to fragment or increase fragmentation of the critically endangered ecological community. As the Proposal does not require the broadscale removal of vegetation underneath the lines, other than trees taller than 6 m which have already been avoided as much as possible, existing BGW would persist beneath the new alignments and the Proposal would not fragment or increase the fragmentation of BGW in the landscape.

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:	
Adversely affect habitat critical to the survival of an ecological community	**Yes**. The BGW Recovery Plan identifies "habitat critical to the survival of Box Gum Grassy Woodland is on the moderate to highly fertile soils of the western slopes of NSW and Queensland, the northern slopes of Victoria, and the tablelands of the Great Dividing Range from southern Queensland through NSW and the ACT. Given the currently highly fragmented and degraded state of this ecological community, all areas of Box Gum Grassy Woodland that meet the minimum condition criteria … should be considered critical to the survival of this ecological community". Based on this advice, the Proposal would result in the loss of 2.37 ha of BGW that is considered critical to the survival of the ecological community. However, the total area of BGW to be impacted is small and distributed across 11 locations within the Direct Impact Area. The majority (2.29 ha) is in the derived state, with just 0.02 ha supporting high quality understorey with multiple important species. On this basis the impact is not considered to be significant.
Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns	**No**. The Proposal would not result in the modification or destruction of abiotic factors such as water, nutrients, or soil, which are necessary for the survival of the community in adjacent areas. Impacts on abiotic factors potentially influencing adjacent areas will be managed to prevent impacts outside of the Direct Impact Area, including controls for preventing the spread of invasive species and for managing erosion and sedimentation during construction. Refer to **Section 5.6.2** for more information on the management measures to be implemented by the Proposal.
Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting	**No.** The Proposal would not cause changes that would result in broader changes in the species composition of an occurrence of the critically endangered ecological community. Following the clearance of the site there would be no ongoing disturbance to the community. No ongoing flora or fauna harvesting would occur, and the Proposal does not require or propose regular burning. Areas of BGW along the new alignments that are outside the Direct Impact Area would be subject to current land management practices (grazing).
Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: • assisting invasive species, that are harmful to the listed ecological community, to become established, or • causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community.	**No.** The Direct Impact Area is located in an agricultural landscape, and the critically endangered ecological community in this area is consequently subject to existing threats associated with invasive species and agricultural activities independent of the Proposal. The Proposal is unlikely to substantially change these threats. During construction there is an increased risk of invasive weed species becoming established through soil disturbance and vehicle movements. This increased risk will be managed through the implementation of appropriate mitigation and management measures to prevent potential reductions in the quality or integrity of adjacent occurrences of the ecological community (see **Section 5.6.2**). No chemicals or hazardous materials are proposed to be stored on site once the Proposal is operational. The Proposal would therefore be unlikely to a cause a substantial reduction in the quality or integrity of the ecological community where it occurs adjacent to the Direct Impact Area.

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:	
Interfere with the recovery of an ecological community	**No**. Degradation of higher quality box gum woodland remnants as a result of public infrastructure development is identified as a key threat to BGW in the BGW Recovery Plan. However, the loss of 2.37 ha of BGW across 11 different areas, comprising 0.08 ha of woodland (ACT16.1), 0.02 ha of moderate-high quality derived native grassland (ACT16.4) and 2.27 ha of low quality derived native grassland (ACT16.5) is small compared to the extent of box gum woodland and derived native grassland located within the broader landscape. Key recovery actions for BGW identified in the BGW Recovery Plan include collecting baseline information, the protection of BGW in reserves, community engagement and further research. BGW Recovery Plan objectives also include achieving no net loss of BGW throughout its geographic distribution, increasing protection of sites with high recovery potential, increasing restoration and increasing transitional areas, and changing attitudes of participating land managers. While the Proposal would result in the net loss of 2.37 ha of BGW, it is largely in the derived state with sparse, or no, canopy cover. It is also in the context of a broader agricultural landscape. As such, it is considered that, despite the clearance of 2.37 ha of BGW, the Proposal would not interfere with the BGW Recovery Plan objectives listed above, or the recovery of the ecological community.
Conclusion	**Not significant** The Proposal would result in the loss of 2.37 ha of BGW across 11 locations within the Direct Impact Area. The majority (2.29 ha) is in the derived state, with just 0.02 ha supporting moderate-high quality understorey with multiple important species. All zones were assessed as Class B due to the sparse cover (or absence) of canopy species. The BGW Recovery Plan states that all areas of BGW should be considered critical to the survival of this ecological community. Based on this advice, the Proposal would result in the loss of 2.37 ha of BGW that is considered critical to the survival of the ecological community. While the Proposal has been positioned to avoid areas of BGW where possible (including areas supporting mature and hollow-bearing trees), six trees would be permanently removed, and a further 10 would require modification (canopy reduction) to maintain standards required under overhead powerlines. This impact is restricted to the eastern end of the new alignments where the powerlines would be closest to the ground. The patches of BGW that would be impacted form part of and are on the edge of a much larger patch of woodland and derived native grassland in the broader landscape, which includes areas protected in the Woodstock and Molonglo River Nature Reserves. The reduction in extent of 2.37 ha of BGW caused by the Proposal is minimal in the context of the wide distribution of BGW within the surrounding landscape, especially noting that the impacted BGW is made up of many small, dispersed patches, mostly in a low quality, derived state. As such, it is considered unlikely that the Proposal would have a significant impact on the BGW TEC through a reduction in extent of BGW or via adverse impacts on habitat critical to the survival of the community.

5.4.2.2 Natural temperate grassland

Less than 0.01 ha of NTG is present in the Direct Impact Area and would be directly impacted by the Proposal (see **Figure 5.6**). This patch meets the high to very high condition threshold (patches with good native coverage and high native plant diversity) as defined in the NTG Conservation Advice.

Recognising the high quality of this patch, it is considered that the exotic grassland adjacent to the patch, which is of a much lower quality and does not conform with the EPBC Act listing criteria on its own, would act as a buffer in accordance with the NTG Conservation Advice. Based on Section 5.3 of the NTG Conservation Advice, the buffer zone is considered to form part of the patch but is not part of the TEC and is not formally protected as a MNES under the EPBC Act.

The NTG Conservation Advice recommends that a minimum buffer zone width of 30 m is adopted from the edge of a patch of NTG. To take a conservative approach, a buffer zone width of 40 m has been adopted around the patch of NTG in the Direct Impact Area, which is equivalent to the width of the exotic-dominated grassland (ACT01.4) adjacent to the patch of NTG (see **Figure 5.6**). Consistent with the NTG Conservation Advice, the buffer zone has not been considered part of the NTG for determining direct impacts, but may be subject to indirect impacts. This is discussed further in **Section 5.4.6**. It is recognised that the edges of a patch of NTG are particularly susceptible to disturbance, thus the buffer zone will be managed with particular care during construction. Refer to **Section 5.6.2** for the mitigation and management measures to be adopted by the Proposal.

As the direct impact on NTG is located at the edge of a patch, adjacent to exotic grassland, and management of the adjacent grassland areas in the Proposal Area will be consistent with industry best practice (see **Section 5.6.2**), no further impacts or fragmentation of NTG are likely.

Assessing the significance of the Proposal's impact to NTG has considered the definitions of a significant impact under both the EPBC Act, and the Planning Act, in taking into account the nature and magnitude of potential impacts, including:

- the sensitivity, resilience and rarity of the environment which will be impacted
- the kind, size, duration and frequency of the action and its impacts
- all direct and indirect impacts
- existing levels of impact from other sources (refer **Section 5.5**).

Table 5.14 Considerations for Significance – NTG

Consideration	Response
The sensitivity, resilience and rarity of the environment which will be impacted	The NTG located within the impact footprint is considered of high quality, and is located within the boundary of a Nature Reserve. It has an FVS of 20, however contains only limited value for threatened fauna species – potential perunga grasshopper and low quality golden sun moth habitat. It does not contain PTWL habitat. Based on the FVS, the site would be considered a Conservation Category 1 or 2 site under the ACT's Native Grassland Conservation Strategy and Action Plan. NTG is considered sensitive to impact, and rare in the landscape. Due to the quality of the NTG, the impact area was moved to be located within the exotic grassland surrounding the patch. Edge effects to the NTG may occur, which is the basis of this impact assessment.

Consideration	Response
The kind, size, duration and frequency of the action and its impacts	The impact to NTG will be discreet within the landscape, occurring at one site only, with direct impacts to be largely avoided. Construction will be short term in nature, and ongoing access for maintenance at this tower will be able to be managed to avoid areas of native grassland, as access would be located on the Stockdill Drive side of the tower.
All direct and indirect impacts	Direct impacts will only occur during initial site preparation works. Establishment of exclusion fencing, erosion and sediment control, and the presence of a suitably qualified ecologist on site during construction can help ensure the effectiveness of these measures to prevent direct and indirect impacts. Impact areas assessed are conservative, to ensure all erosion and sediment control, laydown areas, etc are adequately captured; and the exotic grassland buffer has been considered in the impact assessment, as discussed above. Indirect impacts including the potential for the spread of weeds, would be appropriately managed through the CEMP commitments.

A significant impact assessment was undertaken for NTG in accordance with the Significant Impact Guidelines (Department of the Environment, 2013), and the above considerations. As shown in **Table 5.15**, the assessment concluded that the Proposal does not meet the significant impact criteria for NTG and would not have a significant impact on the TEC, given the relatively small size of the area of NTG to be cleared, its location at the edge of a patch, and the mitigation and management measures to be implemented on adjacent grassland.

As such, it is considered unlikely that the Proposal would have a significant impact on the EPBC Act and NC ACT listed NTG TEC.

Table 5.15 Significant Impact Assessment: Natural Temperate Grassland of the South Eastern Highlands

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:	
Reduce the extent of an ecological community	**Yes**. The Proposal would result in the loss of 0.01 ha of NTG. This patch meets the high to very high condition threshold for NTG (patches with good native coverage and high native plant diversity) as it has at least 12 non-grass native species and over 50% ground cover foliage of kangaroo grass. This patch is located adjacent to Stockdill Drive, east of the Molonglo River. It is bordered to the north by a patch of ACT01.4 (tablelands dry tussock grassland), which is dominated by exotic grass species and does not meet the EPBC Act listing criteria on its own, and exotic grassland to the south (see **Figure 5.6**). The reduction in extent of 0.01 ha of NTG caused by the Proposal is minimal in the context of the broader distribution of NTG predicted to occur in the region, particularly along the Molonglo River corridor as shown on ACTmapi, especially noting that the impacted NTG is surrounded by exotic-dominated grasslands that do not align with the EPBC Act NTG listing criteria.
Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	**No**. The loss of 0.01 ha of NTG would not fragment the TEC, as this patch of NTG is located at the edge of the patch adjacent to exotic-dominated grassland.
Adversely affect habitat critical to the survival of an ecological community	**Yes**. The NTG Conservation Advice considers areas critical to the survival of the TEC to "cover all patches that meet the key diagnostic characteristics and condition thresholds for the ecological community plus buffer zones". A buffer zone is defined as a "...contiguous area immediately adjacent to a patch of the ecological community that is important for protecting its integrity. The purpose of the buffer zone is to help protect and manage the national ecological community… As the area of the buffer lies to the outside, around a patch, it is not part of the ecological community and is not formally protected as a matter of national environmental significance. Where the buffer on a particular property is subject to existing land uses, such as cropping, ploughing, grazing, spraying, etc., they can continue. However, practical application of a buffer zone is strongly recommended. The recommended minimum buffer zone for the ecological community is 30 metres from the edge of a patch. A larger buffer zone may be applied, where practical, to protect patches that are of particularly high conservation value, or if patches are down slope of drainage lines or a source of nutrient enrichment." To take a conservative approach, a buffer zone width of 40 m has been adopted around the patch of NTG in the Direct Impact Area, which is equivalent to the width of the exotic grassland (ACT01.4) adjacent to the patch of NTG.

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:	
	The buffer zone covers a total area of 0.50 ha, comprising: • 0.01 ha of ACT01.1 (which is consistent with the EPBC Act NTG listing criteria), all of which would be directly impacted by the Proposal • 0.30 ha of ACT01.4 (which is not consistent with the NTG listing criteria), of which approximately 0.28 ha would be directly impacted by the Proposal • 0.19 ha of exotic vegetation, of which approximately 0.06 ha would be directly impacted by the Proposal. Based on the NTG Conservation Advice, the Proposal would result in the loss of 0.01 ha of NTG that is considered critical to the survival of the TEC. Construction activities will be closely managed to ensure that indirect impacts do not occur on vegetation adjacent to the NTG patch, including 0.34 ha of exotic-dominated grassland within the buffer zone which would also be considered critical to the survival of the TEC as per the above advice. This includes controls to prevent the spread of invasive species and to prevent off-site erosion and sedimentation during construction. Close attention will be paid to any soil disturbance activities which could cause a shift in nutrient levels and endanger downslope areas of the TEC or its buffer zone. Refer to **Section 5.6.2** for further information about the mitigation and management measures to be implemented by the Proposal.
Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns	No. The Proposal would not result in modification or destruction of abiotic (non-living) factors necessary for the survival of the community in adjacent areas, such as water, nutrients, or soil. Natural temperate grasslands have experienced declines due to substantial clearing and fragmentation, nutrient enrichment from fertilisers and livestock, invasive flora and fauna, livestock grazing and changed fire regimes. Current guidelines note that disturbances that alter the hydrology and nutrient status of a patch should be avoided. These include avoiding the influx of nutrients and water to reduce the spread and establishment of invasive species and avoiding the use of fertilisers in and around patches of the TEC. The Proposal will implement a range of management measures to ensure that indirect impacts arising from these sources do not occur. This will include controls for preventing the spread of invasive species and for managing erosion and sedimentation during construction. Close attention will be paid to any soil disturbance caused by construction activities to avoid disturbing any areas that contain NTG and which could cause a shift in nutrient levels and endanger the TEC. Refer to **Section 5.6.2** for more information about the mitigation and management measures to be implemented by the Proposal.

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:	
Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting	**No**. The Proposal would not cause changes that would result in broader changes in the species composition of any NTG patches. Following the clearance of the construction footprint, there would be no ongoing disturbance to the community such as clearance or flora or fauna harvesting. Areas of NTG along the new alignments which would not be impacted by the Proposal (e.g. underneath the powerlines) will be managed consistent with current practices (grazing).
Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: • assisting invasive species, that are harmful to the listed ecological community, to become established, or • causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community	**No**. The Proposal is located in an agricultural landscape, and the NTG in this area is consequently subject to existing threats associated with invasive species and agricultural activities independent of the Proposal. The Proposal is unlikely to substantially change these threats. During construction there is an increased risk of invasive weed species becoming established through soil disturbance and vehicle movements. This increased risk will be managed through the implementation of appropriate mitigation and management measures to prevent potential reductions in the quality or integrity of adjacent areas of NTG, such as the demarcation of approved clearance boundaries and fencing and access control (see **Section 5.6.2**). The Proposal would therefore be unlikely to a cause a substantial reduction in the quality or integrity of the TEC where it occurs adjacent to the Direct Impact Area.
Interfere with the recovery of an ecological community	**No**. The NTG Conservation Advice states that loss due to clearing is a key threat to NTG. However, due to the small area of the loss resulting from the Proposal (0.01 ha), the Proposal is unlikely to interfere with the recovery of the TEC.
Conclusion	**Not significant** The Proposal would result in the loss of 0.01 ha of high quality NTG which would reduce the extent of the TEC in the landscape by a very minor amount, and adversely affect habitat critical to the survival of the TEC as defined under the NTG Conservation Advice. However, this patch is located at the edge of a patch of NTG adjacent to exotic-dominated grassland (ACT01.4 and other exotics) where its loss would not lead to fragmentation of the TEC. Additionally, a range of mitigation and management measures will be implemented by the Proposal to ensure that indirect impacts on adjacent areas of grassland, including areas of exotic grassland considered to be part of the NTG buffer zone as defined in the NTG Conservation Advice, will not occur. It is therefore considered unlikely that the Proposal would have a significant impact on the NTG TEC through a reduction in the extent of NTG or via adverse impacts on habitat critical to the survival of the community.

5.4.3 Threatened Flora

No threatened flora species assessed as having a moderate or high likelihood of occurrence in the Proposal Area were detected during targeted species surveys in the Direct Impact Area. As such, impacts on these species are considered unlikely and no further assessment was undertaken.

5.4.4 Threatened Fauna

5.4.4.1 Superb parrot

Impacts have been minimised through strategic redesign of the Proposal over several years of ecological investigations, including through the refined placement of tower footings and the use of poles rather than towers, which allowed the transmission line heights to be increased above woodland areas, and the direct impact area around the footings to be reduced. As a result, the Proposal would not impact any potential superb parrot nesting trees.

Superb parrot is known to breed in the lower Molonglo Valley approximately 5 km east of the Direct Impact Area. Although no individuals were recorded in the Direct Impact Area, it is likely that the Proposal Area is used by the species for foraging, and that it supports breeding pairs from known nesting trees (the species is known to travel up to 10 km from breeding sites to foraging areas). *Eucalyptus* and *Acacia* species recorded in the Direct Impact Area provide superb parrot foraging habitat. As the species is also known to feed on native grass seed, it is likely that the superb parrot may also use open grassland areas within the Proposal Area. As such, all native vegetation within the Direct Impact Area is considered to be potential foraging habitat for superb parrot (4.91 ha made up of multiple separate areas distributed along the new alignments).

Habitat critical to the survival of the species is defined in the National Recovery Plan for the Superb Parrot *Polytelis swainsonii* (Superb Parrot Recovery Plan) (DAWE, 2021b) and includes both breeding and foraging habitat.

In addition, the Superb Parrot Recovery Plan states that the species requires vegetated corridors to move between breeding and foraging habitat (the species is known to travel up to 10 km from breeding sites to foraging areas), and that degradation and destruction of movement corridors is a key factor implicated in the species' decline. Seventeen trees within the superb parrot tree assessment area were confirmed to be within the height range (10–15 m) identified as critical for superb parrot movement. Of these, three are within the Direct Impact Area and six are adjacent to the new alignments where they would require canopy reduction.

Assessing the significance of the Proposal's impact to superb parrot has considered the definitions of a significant impact under both the EPBC Act, and the Planning Act, in taking into account the nature and magnitude of potential impacts, including:

- the sensitivity, resilience and rarity of the environment which will be impacted
- the kind, size, duration and frequency of the action and its impacts
- all direct and indirect impacts
- existing levels of impact from other sources (refer **Section 5.5**).

Table 5.16 Considerations for Significance – Superb Parrot

Consideration	Response
The sensitivity, resilience and rarity of the environment which will be impacted	The habitat for superb parrot being impacted is located within an environment that is largely rural land. It exhibits a history of land clearing, and is managed for agricultural purposes, subject to stock grazing, and vehicle access. It is not considered highly sensitive due to the existing land use. The majority of foraging habitat impacted by the Proposal is grassland, which superb parrot may utilise for foraging grass seeds. This habitat is extensive throughout the local area, and is not considered a rarity. Three trees within the height range (10–15 m) considered to be important for superb parrot movement will be removed by the Proposal, and a further six trees will need to be trimmed due to canopy height restrictions. These trees are located at the edge of the highly vegetated areas adjoining the GCC, and the Molonglo River Corridor, adjacent to already cleared rural land. The presence of mature trees in the local landscape is not rare.
The kind, size, duration and frequency of the action and its impacts	The Proposal will result in a singular clearing event for the 3 movement trees, and then regular maintenance of the heights of the 6 trees within the easement. This will occur when they become a hazard to line maintenance, observed through regular monitoring. The Proposal will be undertaken over a short timeframe, with small scale, localised removal of grassland foraging habitat during construction of access tracks and tower foundations, at a low intensity across the landscape. Reseeding will occur post-construction. The quantity of grassland lost will be minor in comparison to surrounding available areas.
All direct and indirect impacts	Direct impacts to superb parrot will include the removal of up to 4.91 ha of native grassland foraging habitat, 3 movement trees, and modification of a further 6. Indirect impacts may include noise impacts during construction, ongoing modification of movement trees, and potential collision risk with powerlines, although this is not considered a high risk for the species.

A significant impact assessment was undertaken for superb parrot in accordance with the Significant Impact Guidelines (Department of the Environment, 2013), and the considerations above. As shown in **Table 5.17**, the assessment and submitted to DCCEEW in the EPBC Referral concluded that the removal of 4.91 ha of potential foraging habitat could adversely affect habitat critical to the survival of the species. As the Superb Parrot Recovery Plan states that actions that will remove habitat critical to the survival of the species would likely interfere with the recovery of the species, the Proposal had the potential to result in a significant impact on superb parrot.

DCCEEW determined that the Action would not have a significant impact, and was determined not a controlled action. As such, impacts on this species do not require offsetting.

Table 5.17 Significant Impact Assessment for superb parrot

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Lead to a long-term decrease in the size of an important population of a species	**No**. The Superb Parrot Recovery Plan does not define any important populations of superb parrot. The species' distribution extends from northern Victoria through to northern NSW, west of the Great Dividing Range, including the northern part of the ACT. In the ACT region, yellow box-red gum grassy woodlands form the major habitat of the species, with large Blakely's red gum (*Eucalyptus blakelyi*) and scribbly gum (*E. rossii*) being the main source of nesting hollows and the woodland understorey being the main foraging habitat (TSSC, 2016b). The Proposal would not impact any potential superb parrot nesting trees, and the species was not recorded during targeted surveys for the Proposal. Superb parrot is known to breed in the lower Molonglo Valley approximately 5 km east of the Direct Impact Area. Although no individuals were recorded in the Direct Impact Area, it is likely that the species utilises the Proposal Area for foraging, including supporting breeding pairs from known nesting trees (the species is known to travel up to 10 km from breeding sites to foraging areas). *Eucalyptus* and *Acacia* species recorded in the Direct Impact Area provide superb parrot foraging habitat. As the species is also known to feed on native and exotic grass seed, it is likely that the superb parrot may also use the open grassland areas within these areas. As such, all native vegetation within the Direct Impact Area is considered potential foraging habitat for the superb parrot (4.91 ha made up of multiple separate areas distributed along the new alignments). The Superb Parrot Recovery Plan states that the species requires vegetated corridors to move between breeding and foraging habitat and that degradation and destruction of movement corridors is a key factor implicated in the species' decline. The Proposal would require the removal of three trees that were confirmed to be within the height range (10–15 m) identified by the Conservator's office as critical for superb parrot movement, and modification of a further six trees to comply with canopy height restrictions. The Proposal Area is situated adjacent to larger areas of grassland and woodland areas, including those protected within the Woodstock and Molonglo River Nature reserves. Potential foraging and movement habitat is therefore extensive in the local landscape. Due to the dispersed distribution of habitat along the new alignments and the availability of potential habitat in the broader landscape, it is considered unlikely that the impact on potential superb parrot foraging and movement habitat would lead to a long term decrease in the size of an important population of the species.
Reduce the area of occupancy of an important population	**No**. The Superb Parrot Recovery Plan does not define any important populations of superb parrot. The area of occupancy for the species is currently estimated to be 790,000 ha and is considered stable (Garnett & Baker, 2021). Superb parrot is known to occur in the lower Molonglo River corridor adjacent to the Direct Impact Area. Although no individuals were recorded during Proposal surveys, it is likely that the species utilises the Proposal Area for foraging, including supporting breeding pairs from known breeding habitat in the Molonglo Valley. The Superb Parrot Recovery Plan states that clearing of foraging habitat has been followed by the species abandoning nearby traditional breeding areas, even where suitable nesting trees remain, and that population size is primarily limited by clearing of woodland foraging habitat. This is especially the case for foraging habitat located within 10 km of nesting trees.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
	While the removal of 4.91 ha of potential foraging habitat by the Proposal (which is within 10 km of known superb parrot nesting trees) could impact the area of occupancy of a local population of the species, the Proposal is unlikely to reduce the area of occupancy of an important population as no important population is defined.
Fragment an existing important population into two or more populations	**No**. The Superb Parrot Recovery Plan does not define any important populations of superb parrot. The species has a breeding range that extends west of the Great Dividing Range, mostly within the South Western Slopes of NSW and the NSW and Victorian Riverina bioregions (DAWE, 2021b). The Proposal is for the construction of linear infrastructure within a large, contiguous area of woodland and cleared rural land. The total extent of native vegetation that would be impacted by the Proposal (4.91 ha) is made up of multiple separate areas distributed along the new alignments, rather than one consolidated area. The Proposal is therefore unlikely to fragment an existing important population of superb parrot into two or more populations.
Adversely affect habitat critical to the survival of a species	**Yes.** Habitat critical to the survival of the species is defined in the Superb Parrot Recovery Plan and includes both breeding and foraging habitat. In the ACT region, yellow box-red gum grassy woodlands form the major habitat of the species, with large Blakely's red gum and scribbly gum being the main source of nesting hollows and the woodland understorey being the main foraging habitat. Potential superb parrot foraging and breeding habitat present within the broader landscape has been avoided where possible through strategic design of the Proposal, including through micrositing of tower footings and by increasing the height of the conductors to minimise the need for vegetation clearance. Superb parrot is known to breed in the lower Molonglo Valley approximately 5 km east of the Direct Impact Area. Although no individuals were recorded in the Direct Impact Area, it is likely that the species utilises the Proposal Area for foraging, including supporting breeding pairs from known nesting trees (the species is known to travel up to 10 km from breeding sites to foraging areas). *Eucalyptus* and *Acacia* species recorded in the Direct Impact Area provide superb parrot foraging habitat. As the species is also known to feed on native and exotic grass seed, it is likely that the superb parrot may also use the open grassland areas within these areas. As such, all native vegetation within the Direct Impact Area is considered potential foraging habitat for the superb parrot (4.91 ha made up of multiple separate areas distributed along the new alignments). The Superb Parrot Recovery Plan states that clearing of foraging habitat has been followed by the species abandoning nearby traditional breeding areas, even where suitable nesting trees remain, and that population size is primarily limited by clearing of woodland foraging habitat. This is especially the case for foraging habitat located within 10 km of nesting trees. The Superb Parrot Recovery Plan also states that the species requires vegetated corridors to move between breeding and foraging habitat and that degradation and destruction of movement corridors is a key factor implicated in the species' decline. The Proposal would require the removal of three trees that were confirmed to be within the height range (10–15 m) identified by the Conservator's office as critical for superb parrot movement, and modification of a further six trees to comply with canopy height restrictions. The removal and modification of potential foraging and movement habitat may therefore adversely affect habitat critical to the survival of superb parrot.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Disrupt the breeding cycle of an important population	**No.** The Superb Parrot Recovery Plan does not define any important populations of the species. Superb parrot is known to breed in the lower Molonglo Valley approximately 5 km east of the Direct Impact Area. No potential superb parrot nesting trees were identified within the Proposal Area, and the species was not recorded in targeted surveys during the breeding season. However, the Proposal would impact 4.91 ha of potential foraging habitat that may be used by the species during the breeding period. The Superb Parrot Recovery Plan states that clearing of foraging habitat has been followed by the species abandoning nearby traditional breeding areas, even where suitable nesting trees remain, and that population size is primarily limited by clearing of woodland foraging habitat. This is especially the case for foraging habitat located within 10 km of nesting trees. The Superb Parrot Recovery Plan also states that the species requires vegetated corridors to move between breeding and foraging habitat and that degradation and destruction of movement corridors is a key factor implicated in the species' decline. The Proposal would require the removal of three trees that were confirmed to be within the height range (10–15 m) identified by the Conservator's office as critical for superb parrot movement, and modification of a further six trees to comply with canopy height restrictions. While these factors may impact the breeding success of the local superb parrot population, the Proposal Area is situated adjacent to larger areas of grassland and woodland areas, including those protected within the Woodstock and Molonglo River Nature Reserves. Potential foraging and movement habitat is therefore extensive in the local landscape, and it is considered unlikely that the Proposal would disrupt the breeding cycle of an important population of superb parrot.
Modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**No**. The Proposal would impact 4.91 ha of potential foraging habitat. The Superb Parrot Recovery Plan states that clearing of foraging habitat has been followed by the species abandoning nearby traditional breeding areas, even where suitable nesting trees remain, and that population size is primarily limited by clearing of woodland foraging habitat. This is especially the case for foraging habitat located within 10 km of nesting trees. The Superb Parrot Recovery Plan also states that the species requires vegetated corridors to move between breeding and foraging habitat and that degradation and destruction of movement corridors is a key factor implicated in the species' decline. The Proposal would require the removal of three trees that were confirmed to be within the height range (10–15 m) identified by the Conservator's office as critical for superb parrot movement, and modification of a further six trees to comply with canopy height restrictions. However, these impacts would not remove the ability for the species to travel between the northern and southern sides of the new alignments, particularly as the Proposal would retain all woodland within the Molonglo and Murrumbidgee River corridors which provides high woodland connectivity value. The Proposal Area is situated adjacent to larger areas of grassland and woodland areas, including those protected within the Woodstock and Molonglo River Nature Reserves. The extent of habitat to be removed is therefore considered small in the context of the surrounding habitat, and it is noted that the closest known breeding area is approximately 5 km east of the Direct Impact Area. It is therefore considered unlikely that the impact on superb parrot habitat would lead to a decline in the species.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	**No.** Indirect impacts on potential foraging habitat in proximity to the Proposal will be managed through exclusion fencing and pest plant and animal management, as described in **Section 5.6.2**. Hygiene protocols will be in place for vehicles during the construction phase, and vehicles will utilise existing roads where possible. Mitigation measures will be implemented in accordance with a CEMP. The nature of the Proposal (involving the construction of linear infrastructure and minimal ongoing impacts once operational), means that it is unlikely to increase the existence of invasive animals such as feral cats or foxes within the landscape, and would also not increase domestic animals in the area. As such, the Proposal is unlikely to lead to invasive species becoming established in superb parrot habitat.
Introduce disease that may cause the species to decline, or	**No**. Superb parrot is susceptible to Psittacine beak and feather disease (PBFD). The loss of nest hollows is likely to intensify competition and use of nest trees, and thus may increase the likelihood of transmission of the disease. The Proposal would not impact any potential nesting trees, and the species was not observed in the Proposal Area during targeted surveys. The potential for the Proposal to increase the risk of PBFD is therefore considered low. Indirect impacts on foraging habitat near the Proposal will be minimised through exclusion fencing and pest plant and animal management. Hygiene protocols will also be implemented for construction vehicles, and vehicles will utilise existing roads where possible. Mitigation measures will be implemented in accordance with the CEMP. As such, the Proposal is unlikely to introduce disease that may cause superb parrot to decline.
Interfere substantially with the recovery of the species	**No**. The Superb Parrot Recovery Plan states that the removal of habitat critical to the survival of the species would likely interfere with the recovery of the superb parrot. The Proposal would require the removal of 4.91 ha of potential foraging habitat. This habitat is considered to be critical to the survival of the species as defined in the Superb Parrot Recovery Plan. The Superb Parrot Recovery Plan states that clearing of foraging habitat has been followed by the species abandoning nearby traditional breeding areas, even where suitable nesting trees remain, and that population size is primarily limited by clearing of woodland foraging habitat. This is especially the case for foraging habitat located within 10 km of nesting trees. The Superb Parrot Recovery Plan also states that the species requires vegetated corridors to move between breeding and foraging habitat and that degradation and destruction of movement corridors is a key factor implicated in the species' decline. The Proposal would require the removal of three trees that were confirmed to be within the height range (10–15 m) identified by the Conservator's office as critical for superb parrot movement, and modification of a further six trees to comply with canopy height restrictions. These factors indicate that the Proposal could interfere with the recovery of the species at a local level. However, given that the habitat that would be impacted by the Proposal is made up of multiple separate areas distributed along the new alignments, rather than one consolidated area, and that there is extensive habitat remaining in the broader region and no individuals were recorded in the Proposal Area, the Proposal is not expected to interfere substantially with the recovery of superb parrot. Recovery objectives identified in the Superb Parrot Recovery Plan include determining population trends, increasing knowledge of ecological requirements, developing threat abatement strategies and increasing community involvement and awareness of superb parrot. The Proposal would not interfere with the implementation of these objectives.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Conclusion	**Potentially significant** Potential superb parrot foraging and breeding habitat present within the broader landscape has been avoided where possible through strategic design of the Proposal, including through micrositing of tower footings and by increasing the height of the conductors to minimise the need for vegetation clearance. Despite these avoidance efforts, the Proposal would still require the removal of three movement trees located within the Superb Parrot Tree Assessment Area and 4.91 ha of foraging habitat, and the modification of an additional six movement trees to comply with canopy height restrictions underneath powerlines. These impacts are considered to be unavoidable. Superb parrot is known to breed in the lower Molonglo Valley approximately 5 km east of the Direct Impact Area. Although no individuals were recorded in the Direct Impact Area, it is likely that the species utilises the Proposal Area for foraging, including supporting breeding pairs from known nesting trees (the species is known to travel up to 10 km from breeding sites to foraging areas). The removal of 4.91 ha of foraging habitat and the loss and modification of potential movement trees may adversely affect habitat critical to the survival of a species according to the Superb Parrot Recovery Plan. The Proposal therefore has the potential to result in a significant impact on the superb parrot.
EPBC Decision	**Not a controlled action**

5.4.4.2 Gang-gang cockatoo

The Proposal would require the removal of six potential foraging trees for gang-gang cockatoo, one of which is also a potential nesting tree for the species. In addition, ten potential foraging trees, one of which is also a potential nesting tree, are located near the Direct Impact Area and would need to be modified to comply with canopy height restrictions for vegetation adjacent to or underneath powerlines.

Impacts have been minimised through strategic redesign of the Proposal over several years of ecological investigations, including through the refined placement of tower footings and the use of poles rather than towers, which allowed the transmission line heights to be increased above woodland areas, and the direct impact area around the footings to be reduced.

Five gang-gang cockatoo were recorded within the new alignments corridor to the west of the Murrumbidgee River, likely transiting through the site (see **Figure 5.7**). The Conservation Advice for *Callocephalon fimbriatum* (Gang-gang Cockatoo) (Gang-gang Cockatoo Conservation Advice) (DAWE, 2022) does not provide any definitions for populations of the species, but indicates that there could be up to four subpopulations, with three discrete subpopulations potentially located within south-western Victoria which may be separate from individuals occurring in the east (including the ACT). As such, the five individuals seen within the new alignment corridor are most likely part of an eastern subpopulation of the species.

The Gang-gang Cockatoo Conservation Advice states that habitat critical to the survival of the gang-gang cockatoo includes all foraging habitat during both the breeding and non-breeding seasons (excluding exotic feeding grounds such as ornamental trees, shrubs, and hedges) (DAWE, 2022). It notes that habitat critical to the survival of the species includes hollow-bearing trees with known or potential gang-gang cockatoo hollow chambers.

Assessing the significance of the Proposal's impact to gang-gang cockatoo has considered the definitions of a significant impact under both the EPBC Act, and the Planning Act, in taking into account the nature and magnitude of potential impacts, including:

- the sensitivity, resilience and rarity of the environment which will be impacted
- the kind, size, duration and frequency of the action and its impacts
- all direct and indirect impacts
- existing levels of impact from other sources (refer **Section 5.5**).

Table 5.18 Considerations for Significance – Gang-Gang Cockatoo

Consideration	Response
The sensitivity, resilience and rarity of the environment which will be impacted	The habitat for gang-gang cockatoo being impacted is located within an environment that is largely rural land. It exhibits a history of land clearing, and is managed for agricultural purposes. The impact area is located directly adjacent to the Stockdill Substation, which is a noise and light generating, industrial site in the environment, and adjacent to Stockdill Drive and the nearby LMWQCC. Hollow bearing trees are considered a limited resource in the environment, but are unlikely to be a overly uncommon in this location due to the proximity to protected woodland in adjacent Nature Reserves.

Consideration	Response
	Avoidance of these trees was undertaken at a fine scale based on hollow inspections undertaken by a subject matter expert. Of the three potential nesting trees that could be impacted, the two demonstrating potential of past preparation by gang-gang cockatoo (and therefore higher priority to retain) were avoided, with the one tree with no evidence of past preparation impacted by the works.
The kind, size, duration and frequency of the action and its impacts	The Proposal will result in a singular clearing event for the nesting and foraging trees, and then regular maintenance of the heights of the 10 trees within the easement. This will occur when they become a hazard to line maintenance, observed through regular monitoring. The loss of a hollow-bearing tree is a permanent impact.
All direct and indirect impacts	6 potential foraging trees, including 1 potential nesting tree would be removed. 10 potential foraging trees, including 1 potential nesting tree would be trimmed due to height restrictions. Indirect impacts may include noise impacts during construction, ongoing modification of foraging trees, and potential collision risk with powerlines, although this is not considered a high risk for the species.

A significant impact assessment was undertaken for gang-gang cockatoo in accordance with the Significant Impact Guidelines (Department of the Environment, 2013), and the considerations above. As shown in **Table 5.19**, the assessment submitted to DCCEEW in the EPBC Referral concluded that the removal of one potential nesting tree and six potential foraging trees, and the modification of one additional potential nesting tree and 10 potential foraging trees, would adversely affect habitat critical to the survival of the species. Further, the Gang-gang Cockatoo Conservation Advice states that actions that will remove habitat critical to the survival of the species would likely interfere with the recovery of the species, thus the Proposal has the potential to have a significant impact on gang-gang cockatoo. DCCEEW determined that the Action would not have a significant impact, and was determined not a controlled action. As such, impacts on this species do not require offsetting.

Table 5.19 Significant Impact Assessment for gang-gang cockatoo

An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:	
Lead to a long-term decrease in the size of a population of a species	**No**. Gang-gang cockatoo is known to occur within the lower Molonglo River Corridor adjacent to the Direct Impact Area and five individuals were recorded within the new alignments corridor during the Proposal's field surveys. The Gang-gang Cockatoo Conservation Advice does not provide any definitions for populations of the species, but indicates that there could be up to four subpopulations, with three discrete subpopulations potentially located within south-western Victoria which may be separate from individuals occurring in the east (including the ACT). As such, individuals known to occur in the ACT region, including those seen in the Proposal Area, are most likely part of an eastern subpopulation of the species. The species has a wide-ranging diet, with mainly arboreal foraging in the canopy of woodland assemblages. Old growth forest and woodland assemblages are favourable for nesting, loafing and roosting. The species nests in the hollows of tree trunks and limbs. Nesting and roosting sites are often near water, where larger hollow-bearing trees can be more common. Breeding pairs within the ACT are recognised to utilise a broad range of habitat including woodland, mountain forests, and peri-urban spaces in suitable nesting and foraging tree species. Six potential foraging trees in the Direct Impact Area, one of which also provides potential breeding habitat, were identified within the Direct Impact Area and would need to be removed to comply with canopy height restrictions for overhead powerlines. In addition, 10 potential foraging trees, one of which also provides potential breeding habitat, are close to the Direct Impact Area and would require modification. The species distribution spans from northern NSW to southern Victoria. Breeding pairs within the ACT are recognised to utilise a broad range of habitat including woodland, mountain forests, and peri-urban spaces in suitable nesting and foraging tree species. Given the extent of potential habitat in the surrounding landscape, it is unlikely that the removal of six potential foraging trees and two potential nesting trees, and modification of 10 additional foraging trees and one potential nesting tree, would lead to a long-term decrease in the size of a population of gang-gang cockatoo.
Reduce the area of occupancy of a population	**No**. Gang-gang cockatoo is known to occur within the lower Molonglo River Corridor adjacent to the Direct Impact Area and five individuals were recorded within the new alignments corridor during the Proposal's field surveys, and are likely to be part of the eastern subpopulation of the species tentatively identified in the Gang-gang Cockatoo Conservation Advice. Further, the species is known to occupy a range of habitats in and around the ACT including woodland, mountain forests, and peri-urban spaces in suitable nesting and foraging tree species. The removal of six potential foraging trees, including one potential nesting tree that is not known to be utilised, is unlikely to reduce the area of occupancy of an eastern population of gang-gang cockatoo. Given the broad distribution of the species and extensive potential habitat in the surrounding landscape, the area of occupancy of the individuals occurring in eastern Australia is unlikely to be reduced as a result of the Proposal.

An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:	
Fragment an existing population into two or more populations	**No**. The gang-gang cockatoo distribution spans from northern NSW to southern Victoria. The species is known to occur within the lower Molonglo River Corridor adjacent to the Direct Impact Area and five individuals were recorded within the new alignments corridor during the Proposal's field surveys. The Gang-gang Cockatoo Conservation Advice does not provide any definitions for populations of the species, but indicates that there could be up to four subpopulations, with three discrete subpopulations potentially located within south-western Victoria which may be separate from individuals occurring in the east (including the ACT). As such, individuals known to occur in the ACT region, including those seen near the Proposal Area, are most likely part of an eastern subpopulation of the species. The Proposal is for the construction of linear infrastructure within a large, contiguous area of woodland and cleared rural land. The Gang-gang Cockatoo Conservation Advice notes that the total population of the species is not severely fragmented and is not subject to extreme fluctuations in extent of occurrence or area of occupancy. It also identifies habitat fragmentation as more likely to occur after land clearing or fire events. Land clearing associated with the Proposal is restricted to small areas adjacent to new towers, with vegetation taller than 6 m also requiring removal along the new alignments. The total extent of native vegetation that would be impacted by the Proposal (4.91 ha) is made up of multiple separate areas distributed along the new alignments, rather than one consolidated area. Given that fragmentation from linear infrastructure is not a key threat to the species and land clearing by the Proposal has been minimised, the Proposal is unlikely to fragment an existing population of gang-gang cockatoo into two or more populations.
Adversely affect habitat critical to the survival of a species	**Yes**. The Gang-gang Cockatoo Conservation Advice states that habitat critical to the survival of gang-gang cockatoo includes all foraging habitat during both the breeding and non-breeding season (excluding exotic feeding grounds such as ornamental trees, shrubs, and hedges). It notes that habitat critical to the survival of gang-gang cockatoo includes hollow-bearing trees with known or potential gang-gang cockatoo hollow chambers. Potential foraging and breeding habitat present within the broader landscape has been avoided where possible through strategic design of the Proposal, including through micrositing of tower footings and by increasing the height of the conductors to minimise the need for vegetation clearance. Despite these avoidance efforts, the Proposal would still require the removal of six potential foraging trees, including one potential nesting tree, and the modification of an additional 10 potential foraging trees, including one potential nesting tree. These impacts are considered to be unavoidable. Based on the Gang-gang Cockatoo Conservation Advice, these trees are considered to be habitat critical to the survival of gang-gang cockatoo. The Proposal would therefore adversely affect habitat critical to the survival of the species.

An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:	
Disrupt the breeding cycle of a population	**No**. One potential gang-gang cockatoo nesting tree is located within the Direct Impact Area and would require removal, and one additional potential nesting tree would require modification. No individuals were recorded utilising these potential nesting trees, although five individuals were recorded in the new alignments corridor. The Gang-gang Cockatoo Conservation Advice states that only about half of known nest trees are utilised each year, and that individuals may use the same nesting site for multiple years. The potential nesting trees identified within the Proposal Area are not known to be utilised by gang-gang cockatoo. In a regional context, extensive potential habitat remains within the landscape for gang-gang cockatoo, including habitat already being utilised within the lower Molonglo River corridor. Indirect impacts on potential nesting trees will be managed through exclusion fencing, pest plant and animal management, and light and noise controls (see **Section 5.6.2** for more detail). As gang-gang cockatoo is not known to utilise the potential nesting trees in the Direct Impact Area, and with the implementation of the above controls, the Proposal is unlikely to disrupt the breeding cycle of a population of gang-gang cockatoo.
Modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**No**. The removal of six potential foraging trees (including one potential nesting tree) and modification of 10 potential foraging trees (including one potential nesting tree) is considered unlikely to isolate or decrease the availability or quality of habitat to the extent that gang-gang cockatoo is likely to decline. In a regional context, extensive potential habitat remains within the landscape for gang-gang cockatoo, including habitat already being utilised within the lower Molonglo River corridor. As such, the Proposal is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	**No.** Indirect impacts on potential gang-gang cockatoo habitat trees near the Proposal will be minimised through exclusion fencing, pest plant and animal management, and light and noise controls (see **Section 5.6.2** for more detail). Hygiene protocols will also be implemented for construction vehicles, and vehicles will utilise existing roads where possible. Mitigation measures will be implemented in accordance with the CEMP. The nature of the Proposal (involving the construction of linear infrastructure and minimal ongoing impacts once operational), means that it is unlikely to increase the existence of invasive animals such as feral cats or foxes within the landscape, and would also not increase domestic animals in the area. As such, the Proposal is unlikely to lead to invasive species becoming established in gang-gang cockatoo habitat.
Introduce disease that may cause the species to decline, or	**No**. Indirect impacts on potential habitat trees near the Proposal will be minimised through exclusion fencing and pest plant and animal management. Hygiene protocols will also be implemented for construction vehicles, and vehicles will utilise existing roads where possible. Mitigation measures will be implemented in accordance with the CEMP. As such, the Proposal is unlikely to introduce disease that may cause gang-gang cockatoo to decline.

An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:	
Interfere substantially with the recovery of the species	**No**. The Gang-gang Cockatoo Conservation Advice states that actions that will remove habitat critical to the survival of the species would interfere with the recovery of gang-gang cockatoo. The Proposal would require the removal of six potential foraging trees (including one potential nesting tree) and modification of an additional 10 potential foraging trees (including one potential nesting tree). This habitat is considered critical to the survival of the species and its loss may therefore interfere with the recovery of the species. However, due to the availability of extensive potential habitat within the broader landscape for gang-gang cockatoo, including habitat already being utilised within the lower Molonglo River corridor, the Proposal is not expected to interfere substantially with the recovery of the species. There is no recovery plan for gang-gang cockatoo, however, recovery actions identified in the Gang-gang Cockatoo Conservation Advice include further research, community engagement and preventing further decline through conservation and management priorities. The Proposal would not interfere with the implementation of these objectives.
Conclusion	**Potentially significant** Potential gang-gang cockatoo foraging and breeding habitat present within the broader landscape has been avoided where possible through strategic design of the Proposal, including through micrositing of tower footings and by increasing the height of the conductors to minimise the need for vegetation clearance. Despite these avoidance efforts, the Proposal would still require the removal of six potential foraging trees, including one potential nesting tree, and the modification of an additional 10 potential foraging trees, including one potential nesting tree, to comply with canopy height restrictions for overhead powerlines. These impacts are considered to be unavoidable. The species is not known to utilise the potential nesting trees but is likely to forage throughout the Proposal Area. The species was observed during the Proposal's field surveys in foraging habitat along the Murrumbidgee River, outside of the Direct Impact Area. The removal and modification of potential breeding and foraging habitat may adversely affect habitat critical to the survival of the species according to the Gang-gang Cockatoo Conservation Advice. The Proposal therefore has the potential to result in a significant impact on the gang-gang cockatoo.
EPBC Decision	**Not a controlled action**

5.4.4.3 Little eagle

Little eagle is considered highly likely to use the entire Proposal Area for foraging, although the closest known breeding location is approximately 2 km northeast of Strathnairn, more than 3.4 km from the new alignments. Foraging habitat in the Direct Impact Area is unlikely, in itself, to be critical to the breeding success of pairs known to use the area, nor is it likely to be critical to the success of any active nest sites in the broader landscape given their distance to the Direct Impact Area. Should any pairs establish a nest nearer to the Direct Impact Area in the future, the Direct Impact Area in its current state, may represent a portion of what may be an important area of foraging habitat for nesting success, hence the Proposal could reduce the suitability of potential nesting sites adjacent the site.

The Little Eagle Action Plan for the ACT (Little Eagle Action Plan) (EPSDD, 2013) provides conservation priorities and objectives for the species, including the following objective relevant to little eagle habitat: "Habitat sufficient to maintain a viable, wild population of Little Eagles in the long term is maintained in the ACT and region. This includes nesting sites and foraging areas."

Despite the known occurrence of little eagle in the Proposal Area and the removal of up to 0.04 ha of native dominated grassland (ACT01.1 and ACT01.3), 2.37 ha of box gum woodland and derived grasslands (ACT16.1, ACT16.4 and ACT16.5) and 2.06 ha of dry forest (ACT25.4 and ACT25.5) in the Direct Impact Area, the Proposal is unlikely to have a significant impact on little eagle given the quality and extent of habitat to be removed relative to the extent of similar or higher quality foraging habitat in the surrounding landscape. However, the removal of known occupied foraging habitat at this location does increase pressure on this species locally as it contributes to the loss of utilised habitat in a landscape within which a sufficient, though unknown, amount of habitat must be retained to maintain a viable, wild population of little eagle in the long term.

A significant impact assessment has not been undertaken for this species as it is not EPBC Act listed.

5.4.4.4 Other Threatened Woodland Birds

Seven woodland bird species listed as threatened under the EPBC Act and/or NC Act were identified as having moderate or high likelihood of occurrence within the Proposal Area, including hooded robin, painted honeyeater, diamond firetail, southern whiteface, scarlet robin, varied sittella and white-winged triller. A total of 4.91 ha of potential habitat including box gum woodland, grasslands and open forest in the Direct Impact Area would provide foraging and breeding habitat for woodland birds, and would be directly impacted by the Proposal.

Significant impact assessments were undertaken for hooded robin, painted honeyeater, diamond firetail and southern whiteface in accordance with the Significant Impact Guidelines (Department of the Environment, 2013), in Appendix C of the BAR (**Appendix G1**). The significant impact assessments have not been replicated in the EIS for conciseness. Given the minimal amount of vegetation to be removed by the Proposal, the remaining woodland bird habitat in the broader area, and the nature of each of these species, it is considered that the Proposal is unlikely to have a significant impact on these woodland bird species.

Significant impact assessments were not undertaken for scarlet robin, varied sitella or white-winged triller as these species are not listed under the EPBC Act. However, it is considered that the significant impact assessment for the hooded robin would be applicable to these species.

5.4.4.5 Pink-tailed worm-lizard

A total of 1.09 ha of PTWL habitat occurs within the Direct Impact Area and would be directly impacted by the Proposal (see **Figure 5.8**). Only 0.15 ha of this habitat was determined to be high quality. The presence of PTWL in the Proposal Area has been assumed; however, given the small amount of available habitat in the Direct Impact Area, it is unlikely that it supports an important or key source population.

Most known records of PTWL near the Proposal Area are located to the north, just over the NSW border. There is one isolated record to the southeast of the Proposal Area in rural land, and another in the Ginninderry Conservation Corridor near the NSW border (see **Figure 5.7**). The Proposal is sufficiently distant from the known population across the NSW border to avoid fragmentation of the population.

Assessing the significance of the Proposal's impact to PTWL has considered the definitions of a significant impact under both the EPBC Act, and the Planning Act, in taking into account the nature and magnitude of potential impacts, including:

- the sensitivity, resilience and rarity of the environment which will be impacted
- the kind, size, duration and frequency of the action and its impacts
- all direct and indirect impacts
- existing levels of impact from other sources (refer **Section 5.5**).

Table 5.20 Considerations for Significance – PTWL

Consideration	Response
The sensitivity, resilience and rarity of the environment which will be impacted	The PTWL habitat impacted by the Proposal is scattered throughout a highly modified, largely rural environment. Habitat identification within this area is based on the identification of surface rock, and native grassland, and not through confirmation of species presence. The sensitivity of this habitat is considered low, due to existing land management and disturbance. PTWL is known to occur throughout the Molonglo and Murrumbidgee River Corridors, with this habitat considered important within the ACT distribution of the species. Habitat within these areas would be considered of higher sensitivity and rarity. Siting of towers has avoided any substantial encroachment into the corridors for this reason. Habitat surrounding existing transmission towers in the GCC would be considered of low sensitivity, and high resilience, as it occurs within areas previously disturbed for construction.
The kind, size, duration and frequency of the action and its impacts	The impacts to PTWL habitat will be discreet within the landscape, with construction to be short term in nature, completed within a matter of months. Direct removal of PTWL habitat is likely to occur in one event per site, when site preparation is undertaken. This impact would be permanent. Indirect impacts occurring throughout construction of concrete foundations and towers may occur, however these would be temporary and short-term in nature. Once operational, impacts to PTWL are unlikely to occur.
All direct and indirect impacts	1.09 ha of potential PTWL habitat would be directly impacted by the Proposal. Concrete footings for towers, once constructed will be approximately 2.5m in diameter, with 4 at each tower location. Native grass can be reseeded directly up to the concrete footings, and surface rock reinstated.

Consideration	Response
	The impact areas assessed are conservative, to ensure all erosion and sediment control, laydown areas, etc are adequately captured. Indirect impacts to areas of adjacent habitat from noise and vibration may result from installing concrete foundations. Indirect impacts including the potential for the spread of weeds, and disturbance of surface rock, would be appropriately managed through the CEMP commitments, and site supervision during clearing.

A significant impact assessment was undertaken for PTWL in accordance with the Significant Impact Guidelines (Department of the Environment, 2013), and the considerations above.

Under the EPBC Act, impacts to a vulnerable species must include consideration of whether it is an important population. Neither the ACT or Commonwealth Conservation Advice for pink-tailed worm-lizard define any important populations, and as such, the significant impact assessment provided to the Commonwealth, as per **Table 5.21**, does not discuss any impacts to an important population.

Additional discussion has been provided below in **Table 5.21**.

Table 5.21 Significant Impact Assessment for pink-tailed worm-lizard

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Lead to a long-term decrease in the size of an important population of a species	**No**. The PTWL Conservation Advice does not define any important populations of PTWL. The Direct Impact Area supports a total of 1.09 ha of potential habitat for PTWL across 20 separate patches. Only 0.15 ha is considered high quality. Given the small amount of potential habitat within the Direct Impact Area, it is unlikely that it supports a population that would be considered important. Given the small impact on potential PTWL habitat, and that the impacted habitat is unlikely to support an important population, it is unlikely that the Proposal would lead to a long term decrease in the size of an important population of PTWL.
Reduce the area of occupancy of an important population	**No**. The PTWL Conservation Advice does not define any important populations of the PTWL and states that the species is distributed widely, but patchily. The Direct Impact Area supports a total of 1.09 ha of potential habitat for PTWL across 20 separate patches. Only 0.15 ha is considered high quality. Given the small amount of available habitat within the Direct Impact Area, it is unlikely that it supports a population that would be considered important. Given the small impact on potential PTWL habitat that is unlikely to support an important population, and the extent of potential habitat in the broader landscape that is known to be occupied by PTWL, the Proposal is unlikely to reduce the area of occupancy of an important population of PTWL.
Fragment an existing important population into two or more populations	**No**. The PTWL Conservation Advice does not define any important populations of PTWL and states that the species is distributed widely, but patchily. The Direct Impact Area supports a total of 1.09 ha of potential habitat for PTWL across 20 separate patches. Only 0.15 ha is considered high quality. Given the small amount of available habitat within the Direct Impact Area, it is unlikely that it supports a population that would be considered important. PTWL is known to occur along the Murrumbidgee and Molonglo River Corridors near the Proposal Area, but the Proposal would not impact any areas where the species has been recorded. In addition, the Proposal is for the construction of linear infrastructure within a large, contiguous area of cleared rural land. The total extent of potential PTWL habitat that would be impacted by the Proposal (1.09 ha) is made up of multiple separate areas distributed along the new alignments, rather than one consolidated area. The Proposal is therefore unlikely to fragment an existing important population of PTWL into two or more populations.
Adversely affect habitat critical to the survival of a species	**No**. The PTWL Conservation Advice does not define habitat critical to the survival of species. It notes that PTWL habitat includes primary and secondary grassland, grassy woodland, and woodland communities, and that the species usually inhabits sloping sites that contain rocky outcrops or scattered, partially buried rocks. These rocks are considered important foraging and shelter sites. Given that the extent of the habitat in the Direct Impact Area is small (1.09 ha) and is distributed along the length of the new alignments across 20 separate small patches, it is considered that its removal would not adversely affect habitat critical to the survival of PTWL.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Disrupt the breeding cycle of an important population	**No**. The PTWL Conservation Advice does not define any important populations of PTWL and states that the species is distributed widely, but patchily. The Direct Impact Area supports a total of 1.09 ha of potential habitat for PTWL across 20 separate patches. Only 0.15 ha is considered high quality. Given the small amount of available habitat within the Direct Impact Area, it is unlikely that it supports a population that would be considered important. There is limited information available on the breeding cycle of PTWL. Given that the Direct Impact Area is unlikely to support an important population of the species, it is unlikely that the Proposal would disrupt the breeding cycle of an important population of PTWL.
Modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**No**. The PTWL Conservation Advice notes that PTWL habitat includes primary and secondary grassland, grassy woodland, and woodland communities, and that the species usually inhabits sloping sites that contain rocky outcrops or scattered, partially buried rocks. These rocks are considered important foraging and shelter sites. Given that the extent of the habitat in the Direct Impact Area is small (1.09 ha, of which only 0.15 ha is high quality) and is distributed along the length of the new alignments across 20 separate small patches, and the extent of potential habitat in the broader landscape, the Proposal is unlikely to modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that PTWL is likely to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	**No**. Indirect impacts on potential PTWL habitat adjacent to the Direct Impact Area will be minimised trough exclusion fencing and pest plant and animal management. Hygiene protocols will also be implemented for construction vehicles, and vehicles will use existing roads where possible. Mitigation measures will be implemented in accordance with the CEMP. The nature of the Proposal (involving the construction of linear infrastructure and minimal ongoing impacts once operational), means that it is unlikely to increase the existence of invasive animals such as feral cats or foxes within the landscape, and would also not increase domestic animals in the area. As such, the Proposal is unlikely to lead to invasive species becoming established in PTWL habitat.
Introduce disease that may cause the species to decline	**No**. Indirect impacts on potential PTWL habitat adjacent to the Direct Impact Area will be minimised trough exclusion fencing and pest plant and animal management. Hygiene protocols will also be implemented for construction vehicles, and vehicles will use existing roads where possible. Mitigation measures will be implemented in accordance with the CEMP. The nature of the Proposal (involving the construction of linear infrastructure and minimal ongoing impacts once operational), means that it is unlikely to increase the existence of invasive animals such as feral cats or foxes within the landscape, and would also not increase domestic animals in the area. As such, the Proposal is unlikely to lead to invasive species becoming established in PTWL habitat.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Interfere substantially with the recovery of the species	**No**. The PTWL Conservation Advice lists priority recovery actions for PTWL as avoiding and reducing the removal or modification of habitat, particularly through recreational activities, management actions for invasive species, reduction of impacts from domestic species, research into fire regimes and appropriate land management regimes for landholders. The Proposal would result in the loss of 1.09 ha of potential PTWL habitat, only 0.15 ha of which is high quality. Habitat in the broader region has been avoided, including areas with known records of the species. The Proposal is therefore unlikely to interfere with the recovery of PTWL.
Conclusion	**Not significant** Potential PTWL habitat present within the broader landscape has been avoided where possible through strategic design of the Proposal, particularly through micrositing of tower footings. Despite these avoidance efforts, the Proposal would still require the removal of 1.09 ha of potential PTWL habitat, of which only 0.15 ha is high quality. This impact is considered to be unavoidable. Given that the extent of the potential PTWL habitat in the Direct Impact Area is small (1.09 ha) and is distributed along the length of the new alignments across 20 separate small patches, it is considered unlikely to support an important population of PTWL. As such, the Proposal is unlikely to have a significant impact on PTWL.

As shown in **Table 5.21**, the assessment under the EPBC Act concluded that the Proposal does not meet the significant impact criteria for PTWL and would not have a significant impact on the species given the small amount of potential habitat within the Direct Impact Area, and that the impact will avoid the majority of important habitat within the River Corridors, This was confirmed by the Department, and the proposed action determined to be not a controlled action.

Acknowledging subsequent feedback from the Conservator of Flora and Fauna on the Draft EIS, habitat along the Murrumbidgee and Molonglo Rivers is considered to be regionally important for the species. The ACT Government's Pink-Tailed Worm-Lizard Implementation Plan and Conservation Advice speaks to important linking habitat along the Molonglo and Murrumbidgee Rivers, and conserving medium to large habitat areas outside these corridors.

In the absence of a defined avoidance areas for the species within the corridor, the Project made substantial efforts to avoid construction within the river corridors themselves, and tower placement is at high points in the landscape to allow extended spans across the river corridors. The intent of this was to avoid impact to important habitat in the river corridor. The surveys undertaken demonstrated the patchy distribution of suitable habitat throughout the Study Area, and it was not considered that impacts to medium or large habitat areas were likely.

The Conservator of Flora and Fauna considers that the residual impacts of the proposal have the potential to be significant without appropriate compensatory measures; and has requested meaningful compensation for the species. The GJV's commitment to undertake this action is included in **Section 5.8.2.**

5.4.4.6 Golden sun moth

A total of 4.09 ha of potential GSM habitat is located in the Direct Impact Area and would be directly impacted by the Proposal (see **Figure 5.11**). Only 0.33 ha of this habitat was determined to be high quality. There are no records of GSM occurring within the Proposal Area, and the species was not found during targeted surveys across multiple years.

No important populations have been defined in the GSM Conservation Advice (DAWE, 2021a) and it is unlikely that the Impact Area supports an important population of the species. The GSM Conservation Advice states that habitat critical to the survival of GSM has not yet been identified, but likely includes all native grassland and open grassy woodland habitat occupied by the species across its range. As such, it is considered that the potential GSM habitat in the Direct Impact Area is not habitat critical to the survival of the species as it is not known to be occupied by the species.

A significant impact assessment was undertaken for GSM in accordance with the Significant Impact Guidelines (Department of the Environment, 2013). As shown in **Table 5.22**, the assessment concluded that the Proposal does not meet the significant impact criteria for GSM and would not have a significant impact on the threatened species given that there are no records of GSM within the Proposal Area, the species was not recorded during multiple years of targeted surveys, and the small amount of potential habitat that would be impacted, only 0.33 ha of which is high quality.

Table 5.22 Significant Impact Assessment for golden sun moth

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Lead to a long-term decrease in the size of an important population of a species	**No**. The GSM Conservation Advice does not define any important populations of GSM, however, it notes that large subpopulations or smaller, well-connected subpopulations occurring in high quality habitat would classify for their importance in the long-term maintenance of the species. It identifies that there are 78 known sites within the ACT, 104 in Victoria and 59 in NSW. The Direct Impact Area supports 4.09 ha of potential GSM habitat, only 0.33 ha of which is high quality. Targeted surveys were undertaken for GSM within the areas of potential habitat, in accordance with modelling provided by the Conservator, and in new alignment corridors previously considered for the Proposal. No sightings were recorded. There are also no public records of GSM within the Proposal Area. Potential habitat within the Direct Impact Area is therefore unlikely to support an important population of GSM. Given the small impact on potential GSM habitat, and that the impacted habitat is unlikely to support an important population, it is unlikely that the Proposal would lead to a long term decrease in the size of an important population of GSM.
Reduce the area of occupancy of an important population	**No**. The GSM Conservation Advice does not define any important populations of GSM, however, it notes that large subpopulations or smaller, well-connected subpopulations occurring in high quality habitat would classify for their importance in the long term maintenance of the species. The Direct Impact Area supports 4.09 ha of potential GSM habitat, only 0.33 ha of which is high quality. Targeted surveys were undertaken for GSM within the areas of potential habitat, in accordance with modelling provided by the Conservator, and in new alignment corridors previously considered for the Proposal. No sightings were recorded. There are also no public records of GSM within the Proposal Area. Potential habitat within the Direct Impact Area is therefore unlikely to support an important population of GSM. A known population of GSM is located approximately 3 km to the east of existing Lines 1 and 7, which is not defined as an important population in the GSM Conservation Advice. Given that only 0.33 ha of potential GSM habitat in the Direct Impact Area is of a high quality, it is unlikely that the removal of 4.09 ha of potential habitat that is unlikely to support an important population, would reduce the area of occupancy of an important population of GSM, including the known population to the east of the Direct Impact Area.
Fragment an existing important population into two or more populations	**No**. The GSM Conservation Advice does not define any important populations of GSM, however, it notes that large subpopulations or smaller, well-connected subpopulations occurring in high quality habitat would classify for their importance in the long term maintenance of the species. The Direct Impact Area supports 4.09 ha of potential GSM habitat, only 0.33 ha of which is high quality. Targeted surveys were undertaken for GSM within the areas of potential habitat, in accordance with modelling provided by the Conservator, and in new alignment corridors previously considered for the Proposal. No sightings were recorded. There are also no public records of GSM within the Proposal Area. Potential habitat within the Direct Impact Area is therefore unlikely to support an important population of GSM.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
	A known population of GSM is located approximately 3 km to the east of existing Lines 1 and 7, which is not defined as an important population in the GSM Conservation Advice. Given that only 0.33 ha of potential GSM habitat in the Direct Impact Area is of a high quality, it is unlikely that the removal of 4.09 ha of potential habitat that is unlikely to support and important population, would fragment an important population, including the known population to the east of the Direct Impact Area, into two or more populations.
Adversely affect habitat critical to the survival of a species	**No**. The GSM Conservation Advice states that habitat critical to the survival of GSM has yet to be defined, but likely includes all native grassland and open grassy woodland habitat occupied by the species across its range. It also states that sites occurring towards the limit of the species range, or sites that are a long distance from other known subpopulations are also likely to be defined as habitat critical to the survival of the species. The Direct Impact Area supports 4.09 ha of potential GSM habitat, only 0.33 ha of which is high quality. The species range for GSM spans from southern Victoria to north of Bathurst in NSW, and as such the Direct Impact Area does not occur towards the limit of the species' range. The potential GSM habitat within the Direct Impact Area is not considered habitat critical to the survival of the species, thus the Proposal is not expected to adversely affect habitat critical to the survival of GSM.
Disrupt the breeding cycle of an important population	**No**. The GSM Conservation Advice does not define any important populations of GSM, however, it notes that large subpopulations or smaller, well-connected subpopulations occurring in high quality habitat would classify for their importance in the long term maintenance of the species. The breeding cycle for GSM lasts for a few short days, in which male moths will emerge and patrol for the semi-flightless female. The underground life stages are not well understood. The Direct Impact Area supports 4.09 ha of potential GSM habitat, only 0.33 ha of which is high quality. Targeted surveys were undertaken for GSM within the areas of potential habitat, in accordance with modelling provided by the Conservator, and in new alignment corridors previously considered for the Proposal. No sightings were recorded. There are also no public records of GSM within the Proposal Area. Potential habitat within the Direct Impact Area is therefore unlikely to support an important population of GSM. A known population of GSM is located approximately 3 km to the east of existing Lines 1 and 7, which is not defined as an important population in the GSM Conservation Advice. Given that only 0.33 ha of potential GSM habitat in the Direct Impact Area is of a high quality, it is unlikely that the removal of 4.09 ha of potential habitat that is unlikely to support an important population, would disrupt the breeding cycle of an important population of GSM, including the known population to the east of the Direct Impact Area.
Modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**No**. The GSM Conservation Advice does not define any important populations of GSM, however, it notes that large subpopulations or smaller, well-connected subpopulations occurring in high quality habitat would classify for their importance in the long term maintenance of the species. It identifies that there are 78 known sites within the ACT, 104 in Victoria and 59 in NSW, and the species range extends from southern Victoria to north of Bathurst in NSW.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
	The Direct Impact Area supports 4.09 ha of potential GSM habitat, only 0.33 ha of which is high quality. Targeted surveys were undertaken for GSM within the areas of potential habitat, in accordance with modelling provided by the Conservator, and in new alignment corridors previously considered for the Proposal. No sightings were recorded. There are also no public records of GSM within the Proposal Area. Given that only 0.33 ha of potential GSM habitat in the Direct Impact Area is of a high quality, it is unlikely that the removal of 4.09 ha of potential habitat that is unlikely to support an important population, would modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that GSM is likely to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	**No**. Indirect impacts on potential GSM habitat adjacent to the Direct Impact Area will be minimised trough exclusion fencing and pest plant and animal management. Hygiene protocols will also be implemented for construction vehicles, and vehicles will use existing roads where possible. Mitigation measures will be implemented in accordance with the CEMP. The nature of the Proposal (involving the construction of linear infrastructure and minimal ongoing impacts once operational), means that it is unlikely to increase the existence of invasive animals such as feral cats or foxes within the landscape, and would also not increase domestic animals in the area. As such, the Proposal is unlikely to lead to invasive species becoming established in GSM habitat.
Introduce disease that may cause the species to decline, or	**No**. Indirect impacts on potential GSM habitat adjacent to the Direct Impact Area will be minimised trough exclusion fencing and pest plant and animal management. Hygiene protocols will also be implemented for construction vehicles, and vehicles will use existing roads where possible. Mitigation measures will be implemented in accordance with the CEMP. As such, the Proposal is unlikely to introduce disease that may cause GSM to decline.
Interfere substantially with the recovery of the species	**No**. The primary conservation outcome identified in the GSM Conservation Advice is to retain and protect native grassland remnants within the known distribution of the species, and to ensure remnant subpopulations remain connected or linked to each other. The Proposal would result in the loss of 4.09 ha of potential GSM habitat, only 0.33 ha of which is high quality. Habitat in the broader region has been avoided where possible. The Proposal is therefore unlikely to interfere with the recovery of GSM.
Conclusion	**Not significant** The Proposal would result in the loss of 4.09 ha of potential GSM habitat, only 0.33 ha of which is high quality. Targeted surveys were undertaken for GSM within the areas of potential habitat, in accordance with modelling provided by the Conservator and in new alignment corridors previously considered for the Proposal. No sightings were recorded. There are also no public records of GSM within the Proposal Area. Potential habitat within the Direct Impact Area is therefore unlikely to support an important population of GSM. As such, it is unlikely that the Proposal would result in a significant impact on GSM.

5.4.4.7 Perunga grasshopper

The Direct Impact Area contains 2.28 ha of potential perunga grasshopper habitat. This aligns with the vegetation communities that are dominated by wallaby grasses, spear grasses and/or kangaroo grass (ACT01.1, ACT16.4 and ACT16.5; see **Figure 5.12**).

Due to the difficulty in surveying for the presence of this species as discussed in **Section 5.3.4.7**, presence has not been confirmed. However, following the precautionary principle, the species is assumed to be present. The impact on this species' habitat is therefore 2.28 ha, which is not considered to be significant.

5.4.5 Migratory Birds

As discussed in **Section 5.3.4.7**, the white-throated needletail is the only EPBC Act listed migratory species that has a moderate or greater likelihood of occurrence in the Proposal Area. However, the species is considered unlikely to interact with habitat in the Proposal Area as it is primarily aerial and highly mobile, thus no impacts have been considered for this species.

The EIS Scoping Document (**Appendix A**) requires that impacts on migratory species such as rainbow bee-eater be considered. Rainbow bee-eater is no longer listed under the EPBC Act as a migratory species but has been considered below for completeness.

Rainbow bee-eater is distributed across much of mainland Australia. Because of its widespread distribution and its ability to undertake long-distance movements, the extent of occurrence within Australia has not been estimated (DCCEEW, 2024b). The number of locations that rainbow bee-eater occurs in is unknown, however the population size is assumed to be reasonably large based on reporting rates for the species (DCCEEW, 2024b). The mobility of the species suggests that it is unlikely that any local or regional population would be genetically isolated, and published data indicates that the distribution of the rainbow bee-eater is not severely fragmented (DCCEEW, 2024b). It is currently considered to be a low priority for management. The population size and population trends have not been quantified, but the population size is assumed to be reasonably large, and there is little documented evidence of population declines (DCCEEW, 2024b). Further research is required to determine the population size and population trends, and to determine threats and their actual or potential impacts before any management programs can be implemented meaningfully.

The only identified threat to rainbow bee-eater is the introduced cane toad (*Bufo marinus*), which does not occur within the ACT region. No other threats to the survival of the species have been identified.

For these reasons it is considered unlikely that the Proposal would significantly impact the rainbow bee-eater. No significant impact assessment has been undertaken for the species as it is not listed under the EPBC Act.

5.4.6 Indirect Impacts

Native vegetation and habitat surrounding the Direct Impact Area and within the Proposal Area may be indirectly impacted by the Proposal if indirect impacts are not appropriately managed.

A range of indirect impacts could occur, including:

- Spread of invasive species.
- Noise, vibration and lighting.
- Erosion and sedimentation.
- Dust emissions.
- Waste generation.
- Increased predation efficiency and predator abundance due to the erection of overhead powerlines adjacent to grasslands.
- Increased mortality of birds due to collisions with powerlines.

These potential indirect impacts are discussed in detail below.

5.4.6.1 Spread of Invasive Species

Invasive plants may inadvertently be brought into or spread beyond the Direct Impact Area on equipment and machinery. Six different weed species listed under the ACT *Pest Plants and Animals Act 2005*, including one weed of national significance, were recorded within the Direct Impact Area (blackberry, St John's wort, African lovegrass, Paterson's curse, viper's bugloss and sweet briar).

The risk of spreading these weed species from within and outside the Direct Impact Area, and spread of other weed species, will be managed through the implementation of weed management measures (see **Section 5.6.2** for details). By implementing these measures, the risk of indirect impacts on BGW, NTG, and habitat for various threatened species such as PTWL, will be greatly reduced.

Works associated with the Proposal are unlikely to result in the introduction of any invasive fauna species.

5.4.6.2 Noise, Vibration and Lighting

Noise, vibration and lighting resulting from the Proposal are unlikely to have adverse indirect impacts on ecological values near the Proposal Area (specifically threatened fauna species such as superb parrot, gang-gang cockatoo and PTWL), given the nature of these potential impacts and the ecological values present in the area. Noise and vibration would be temporary, short term (limited primarily to Proposal construction), and of a limited spatial extent, as discussed in **Chapter 10.0**. Lighting would be directed towards the Proposal Area away from adjacent areas of habitat, and would only be operated under poor ambient light levels during construction.

5.4.6.3 Erosion, Sedimentation and Dust

Erosion and sedimentation have the potential to impact ecological values downslope of the Direct Impact Area during Proposal construction. This risk would be managed through an Erosion and Sedimentation Control Plan (ESCP) to minimise erosion during earthworks activities and vehicle movements and to prevent off-site release of sediments and downslope sedimentation impacts. Refer to **Section 6.5.1** for detail.

Dust also has the potential to adversely impact ecological values during ground disturbing works. Potential impacts include dust deposition on vegetation, which could reduce vegetation health and growth and affect vegetation integrity. A CEMP will be implemented which will include measures to minimise the potential for adverse dust impacts.

5.4.6.4 Waste Generation

Waste generated during Proposal construction has the potential to impact ecological values if not managed appropriately. This includes the use of fuels for construction vehicles and machinery, as well as decommissioned infrastructure including steel tower parts and conductors. These risks will be managed through the implementation of industry best practice waste management measures to be detailed in the CEMP. Refer to **Section 13.6** for detail.

5.4.6.5 Increased Predation Efficiency and Predator Abundance

Overhead transmission lines can be used as a predation resource by some bird species, particularly birds of prey. These species may use the powerlines and associated poles as perches for foraging and hunting, and as a nesting substrate. Birds of prey such as brown falcon (*Falco berigora*) and nankeen kestrel (*Falco centroids*), often use transmission lines and poles as foraging perches (Fuentes, 2005). However, there is very limited information available on the impact of transmission lines on the abundance and behaviour of raptors in Australia.

The risk of increased predator efficiency and abundance as a result of the Proposal is considered low. The Proposal involves the relocation of existing transmission lines, so is not introducing a novel feature to the landscape. It would, however, move the area of potential impact to a different part of the landscape and there may be period of adjustment as the faunal community acclimates to the new alignment location. Within the new alignments and the broader landscape, grassland areas are interspersed with areas of open woodland and scattered trees which already provide existing foraging perches and nesting substrates for predatory birds.

5.4.6.6 Collision with Overhead Powerlines

Collision with overhead powerlines and associated infrastructure can be a significant source of mortality for some aerial species. Species considered most at risk are large terrestrial and wetland birds, as well as some small, fast-flying species (Jenkins, Smallie, & Diamond, 2010). Birds that often fly at powerline heights, and which are not familiar with local habitat features, have the greatest collision risk. This includes raptors, owls, cockatoos, and waterbirds. For species that are tied to terrestrial habitats, such as canopy, understorey or ground feeders, the risk of collision is low as they rarely fly at heights where they may encounter transmission lines.

Species considered at potential risk from collision with transmission lines in the Proposal Area include little eagle, superb parrot, gang-gang cockatoo and white-throated needletail. None of the Superb Parrot Recovery Plan (DAWE, 2021b), Gang-gang Cockatoo Conservation Advice (DAWE, 2022) or the ACT Action Plan for Little Eagle (ACT Government, 2013) list the risk of collision with transmission lines as a threat to these species. Gang-gang cockatoo and superb parrot are unlikely to routinely fly at transmission line height whereas little eagle would spend considerable time at heights where the risk of collision would be greater. White-throated needletail are predominantly aerial and highly mobile and there is the constant threat of collision with overhead powerlines when in Australia, however collision with transmission lines affects only a few individuals and is not a threat to the species overall (DCCEEW, 2024a).

The risk of collision with overhead transmission lines is therefore considered low in the Proposal Area. The Proposal involves the relocation of existing transmission lines, so is not introducing a novel feature to the landscape. It would, however, move the area of potential impact to a different part of the landscape and there may be period of adjustment as bird species adapt to the new alignment location. This risk would reduce over time. Habitat in the area is already somewhat fragmented and the greatest area of connectivity is along the Murrumbidgee and Molonglo River corridors. The new transmission lines will be at their highest point when crossing the rivers (to avoid lopping of woodland) and the risk to birds moving along the corridors should therefore be low.

In response to comments on the Draft EIS, additional research was undertaken to determine whether flagging on lines across the river crossings would mitigate risks to collision to white-throated needletail in particular. No definitive research from Australia was found to demonstrate either that lines in this area presented a high risk to white-throated needletail, nor that flagging would reduce risk of strike. This mitigation measure could be retrofitted in response to observed incidents, however at this stage based on current available knowledge, the risk is understood to be low. Monitoring commitments are discussed in **Section 5.8.3**.

5.5 Cumulative Impacts

By the nature of the Proposal, being linear transmission infrastructure, the Proposal will result numerous small-scale impacts across a large spatial area. The impact assessment above has considered direct and indirect impacts from all components of the Proposal, across the entire Proposal Area. The cumulative direct and indirect impacts of the Proposal itself have been considered.

Potential cumulative biodiversity impacts associated with the Proposal and other nearby developments, as well as the NSW component of the Proposal have been assessed below. The cumulative impact assessment considers whether the Proposal's contribution to cumulative impacts is likely to be the key factor that results in a substantial adverse impact on any important ecological values.

5.5.1 Box Gum Woodland

The new alignments were intentionally located to avoid areas of woodland where trees would need to be removed or lopped. As a result, the Proposal is unlikely to result in a significant impact on BGW (in its woodland or derived form), as discussed in **Section 5.4.2.1**. In addition, the Proposal would have minimal direct impacts on areas of habitat connectivity for woodland bird species. As shown in **Figure 5.5**, the Proposal passes through areas of high or moderate woodland habitat connectivity, however these areas are primarily located along the Murrumbidgee and Molonglo Rivers where direct impacts would not occur as a result of the Proposal, and the new conductors would be at their highest above the incised river valleys thereby minimising avifauna collision risk. As such, the Proposal is also unlikely to result in significant fragmentation or loss of habitat connectivity of extant box gum woodland in the local area.

With regards to the combined ACT and NSW components of the Proposal (i.e. the larger action as assessed under the EPBC Act), cumulative impacts to BGW include the loss of 2.95 ha comprising:

- 0.08 ha of woodland – high quality
- 0.02 ha of woodland – moderate-high quality (no regeneration)
- 0.13 ha of woodland – low quality

- 0.45 ha of derived native grassland – moderate-high quality.
- 2.27 ha of derived native grassland – low quality.

This is an additional 0.58 ha of low and moderate quality BGW to the ACT component assessed in this EIS. The Proposal is unlikely to result in significant fragmentation or loss of habitat connectivity of extant box gum woodland in the local area.

Nearby developments would also have a small impact on BGW, including the Territory Battery (1.4 ha of woodland loss and 6.1 ha of derived native grassland loss (Umwelt, 2024)) and the Ginninderry development (0.7 ha of woodland loss and 3.1 ha of derived native grassland loss along Drake Brockman Drive (Umwelt, 2017)). Ginninderry would not impact any BGW in the vicinity of the Proposal. As shown in **Figure 5.5**, neither development is located in an area with continuous woodland connectivity values.

The development of the Proposal, Territory Battery and Ginninderry is unlikely to lead to a loss of landscape connectivity as the developments would retain extant box-gum woodland and other wooded areas. However, due to the loss of disjointed patches of woodland, there could be a small reduction in future potential for improved woody vegetation connectivity. This will be largely compensated by the protection of large areas of woodland connectivity value within the Ginninderry Conservation Corridor, as shown in **Figure 5.5**. As such, the Proposal would have a very minor contribution to cumulative BGW and woodland habitat connectivity impacts in the local area.

5.5.2 Natural Temperate Grassland

The new alignments were intentionally located to avoid areas of high quality native vegetation, including NTG. As a result, the Proposal would have direct impacts on less than 0.01 ha of NTG, which is not considered to be a significant impact (see **Section 5.4.2.2** for further information). No NTG would be impacted within the NSW component of the Proposal, therefore the cumulative impacts of the proposal itself would not be significant.

The Territory Battery project would not impact NTG (Umwelt, 2024). Additionally, the current development plans for Ginninderry indicate that the residential development would also not impact NTG (Umwelt, 2017) (A T Adams Consulting, 2017). There would therefore be no cumulative impacts on NTG from these developments and the Proposal, with direct impacts limited to the <0.01 ha associated with the Proposal.

5.5.3 Superb Parrot and Gang-gang Cockatoo

The new alignments were intentionally located to avoid hollow-bearing trees wherever possible. The Proposal has avoided all trees that may be suitable for superb parrot breeding, but is unable to avoid impacts on two potential gang-gang cockatoo nesting trees (one of which would require removal and the other which would require lopping). Targeted surveys for the Proposal did not indicate that these trees were being used for breeding by gang-gang cockatoo.

Both species are known to occur in the broader landscape surrounding the Proposal. The Proposal would impact 4.91 ha of potential foraging habitat for the superb parrot (made up of multiple separate areas distributed along the new alignments), and 16 potential foraging trees for gang-gang cockatoo (six of which would require removal, and the other 10 which would require lopping). Due to this, the Proposal has the potential to impact on both the superb parrot and gang-gang cockatoo (see **Section 5.4.4.1** and **Section 5.4.4.2** for more detail).

With regards to the combined ACT and NSW components of the Proposal, cumulative impacts to superb parrot include the loss of:

- Six potential foraging trees
- 6.69 ha of native vegetation that constitutes potential foraging habitat, made up of multiple areas distributed along the new alignments.

This comprises an additional 2.5ha of native vegetation in NSW. With regards to gang-gang cockatoo, no additional impacts would result from the NSW component of the Proposal.

Neither the Territory Battery nor Ginninderry residential development would impact superb parrot breeding habitat. While their environmental assessment reports do not discuss impacts on foraging habitat (due to an old definition for habitat critical for the survival of the species which has since been revised in the Superb Parrot Recovery Plan), both projects involve impacts on native grassland and woodland which likely constitute foraging habitat (Umwelt, 2024) (Umwelt, 2017). Cumulatively, the Proposal, Territory Battery and Ginninderry would impact more than 15 ha of native woodlands and grasslands that may constitute superb parrot foraging habitat. As the Proposal would contribute to approximately one-third of this impact (4.91 ha), its contribution to cumulative impacts on superb parrot foraging habitat in the local area is considerable but unlikely to be significant given that the majority (88%) of its impacts are on low quality native vegetation (4.35 ha has a low native forb diversity; see **Section 5.3.1**).

Gang-gang cockatoo was listed under the EPBC Act after the Territory Battery and Ginninderry were assessed, so neither project considered impacts on the species. However, it is likely that trees in woodland being impacted by the two projects would constitute foraging habitat for gang-gang cockatoo. The total number of trees being impacted by all three projects is not known, but is likely to be more than 20 or 30 given that the Proposal would impact 16 potential gang-gang cockatoo foraging trees.

It is difficult to determine how significant the Proposal's contribution to cumulative impacts on gang-gang cockatoo habitat is, given the lack of analysis in other environmental assessments. However, the Proposal would impact a larger number of hollow-bearing trees than the Territory Battery (16 versus one) (Umwelt, 2024). It is not known how many hollow-bearing trees Ginninderry would impact, but the impacts on box gum woodland are comparable to the Proposal (3.8 ha versus 2.37 ha) (Umwelt, 2017) so the impacts on hollow-bearing trees may also be comparable. Regardless, the Proposal will contribute to cumulative impacts on gang-gang cockatoo habitat in the local area.

5.5.4 Other Woodland Birds

Native woodlands and grasslands are generally considered to provide suitable habitat for threatened woodland birds such as hooded robin, painted honeyeater, diamond firetail, southern whiteface, scarlet robin, varied sittella and white-winged triller. The Proposal would impact 4.91 ha of potential habitat for these species, Territory Battery would impact 6.19 ha (Umwelt, 2024) and Ginninderry more than 3.8 ha (3.8 ha is the impact on BGW, so the total impact on native vegetation is likely to be much higher given that the total urban development footprint is 560 ha (Umwelt, 2017)).

The Proposal would likely contribute less than one-third or one-quarter of the cumulative impact on woodland bird habitat (4.91 ha of >14.9 ha) of surrounding developments. Its contribution to this impact would be considerable but is unlikely to be significant, given that the majority of its impacts are on low quality native vegetation (4.35 ha has a low native forb diversity; see **Section 5.3.1**).

5.5.5 Pink-tailed Worm-lizard

The Proposal is unlikely to significantly contribute to cumulative impacts on PTWL in the region given that almost all moderate-high quality habitat in the surrounding area has been avoided by the Proposal. The Proposal would impact just 0.15 ha of potential high quality PTWL habitat, and 1.09 ha of total potential habitat, which is not considered to be a significant impact (see **Section 5.4.4.5** for more detail).

With regards to the combined ACT and NSW components of the Proposal, cumulative impacts to PTWL will include the loss of 1.58 ha of potential habitat, comprising:

- 0.27 ha of high quality habitat across eight patches
- 0.14 ha of moderate-high quality habitat in one patch
- 0.93 ha of moderate quality habitat across 17 patches
- 0.04 ha of moderate-low quality habitat in one patch
- 0.2 ha of low quality habitat across five patches.

The NSW impacts to this species includes 0.12 ha of high quality habitat across 5 patches, and 0.37 ha of moderate quality habitat across 7 patches.

Surrounding developments including the Territory Battery and Ginninderry would cumulatively impact approximately 17 ha of PTWL habitat in a similar landscape context (of which approximately 10 ha is high quality) (Umwelt, 2024) (Umwelt, 2017). The minor scale of the Proposal's impacts on PTWL is not considered to result in a significant increase to this cumulative impact.

5.5.6 Golden Sun Moth

The Proposal is unlikely to significantly contribute to cumulative impacts on GSM given that the species is not known to occur in the area. The species was not recorded during targeted surveys undertaken for the Proposal, Territory Battery or the Ginninderry residential development, providing a strong indication that the species does not occupy this area.

In addition, almost all potential moderate-high quality GSM habitat in the surrounding area has been avoided by the Proposal. The Proposal would impact just 0.33 ha of potential high quality GSM habitat (4.09 ha of total potential habitat), which is not considered to be a significant impact (see **Section 0** for more detail). The assessment reports for the Territory Battery (Umwelt, 2024) and Ginninderry residential development (Umwelt, 2017) do not specify the extent of potential GSM habitat that would be impacted by these projects, as the need to identify and specifically map GSM habitat is a more recent requirement of the Conservator's team.

5.6 Avoidance, Mitigation and Management Measures

5.6.1 Avoidance

Areas in the Proposal Area with high ecological values have largely been avoided through site selection and design. The location and design of the new alignments have been developed through an iterative options assessment process over several years to reduce environmental, cultural and social impacts, as described in **Section 2.4** of this EIS.

The final location (assessed in this EIS) was specifically chosen to avoid impacts on mature hollow-bearing trees (in particular trees taller than 6 m). All trees to the west of the Molonglo River have been avoided, while impacts on trees to the east of the Molonglo River have been avoided where possible, with only six trees to be removed and a further 10 to be modified (lopped) to maintain standards for trees under powerlines. The final positioning of the new tower footings was also determined through the avoidance of patches of high-quality native vegetation, in particular TECs and PTWL habitat.

The micro-siting of the tower footings has ensured that almost all high quality BGW has been avoided, with impacts on BGW minimised to just 2.37 ha across a 10.84 ha Direct Impact Area, of which 2.27 ha is low quality. Impacts on NTG have also been minimised to below 0.01 ha. Almost all high quality PTWL has been avoided, with just 0.15 ha of high-quality habitat located within the Direct Impact Area. A total of 1.09 ha of PTWL habitat would be directly impacted.

The avoidance of box gum woodland is consistent with the Box Gum Woodland Recovery Plan, with the objective to achieve no net loss in extent and condition of the TEC throughout its geographic distribution. The avoidance of NTG is consistent with the NTG Conservation Advice, with the conservation priority to avoid clearance and fragmentation of the TEC as much as possible. The avoidance of PTWL habitat is consistent with the PTWL Conservation Advice, which identifies the need to avoid/reduce the removal of rocks to preserve habitat integrity (TSSC, 2015).

5.6.2 Mitigation and Management

The Proposal would involve the implementation of industry best practice measures to mitigate and manage direct and indirect impacts on biodiversity. Each of these measures will contribute to the protection of habitat adjacent to the Direct Impact Area and within the broader Proposal Area. These mitigation measures have been developed to ensure they are consistent with all relevant Commonwealth and Territory statutory documents, including conservation advices and recovery plans, in particular:

- The National Recovery Plan for White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (NSW DECCW, 2011) and Approved Conservation Advice for the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (TSSC, 2023).
- The Approved Conservation Advice (including listing advice) for Natural Temperate Grassland of the South Eastern Highlands (EC152) (TSSC, 2016a).
- National Recovery Plan for the Superb Parrot *Polytelis swainsonii* (DAWE, 2021b) and Conservation Advice for *Polytelis swainsonii* superb parrot (TSSC, 2016b).
- Conservation Advice for *Callocephalon fimbriatum* (Gang-gang Cockatoo) (DAWE, 2022).
- Conservation Advice *Aprasia parapulchella* Pink-tailed worm-lizard (TSSC, 2015).
- Conservation Advice for *Synemon p*lana (Golden Sun Moth) (DAWE, 2021a).

The mitigation measures have also been developed to ensure they are not inconsistent with the relevant threat abatement plans (TAPs). In particular, the mitigation measures will ensure the Proposal:

- Does not result in an increase in rabbit numbers within the Impact Area in accordance with the Threat abatement plan for competition and land degradation by rabbits (DoEE, 2016).

- Does not result in any actions that would cause an increase in feral pigs in accordance with the Threat Abatement Plan for predation, habitat degradation, competition, and disease transmission by feral pigs (Sus scrofa) (DoEE, 2017).
- Results in a reduction in the spread of weeds and pathogens such as *Phytophthora cinnamomi* in accordance with the Threat abatement plan for disease in natural ecosystems caused by Phytophthora cinnamomi (DoEE, 2018).

The mitigation measures will also ensure that the Proposal does not result in an increase in the spread of cane toads in accordance with the Threat abatement plan for the biological effects, including lethal toxic ingestion, caused by cane toads (DSEWPC, 2011). It is noted however, that the Proposal Area is several hundred kilometres from the predicted area of occurrence of the cane toad, as identified in the TAP, thus cane toads are not considered to pose a particular risk to the Proposal. This TAP has been considered as it is identified as relevant to BGW (DCCEEW, 2024c).

The Commonwealth statutory documents were all accessed via the SPRAT database to ensure the most current versions of the documents were used.

Table 5.23 details the specific measures that will be implemented to mitigate and manage biodiversity impacts. The measures will be documented in the CEMP. The persons and/or entity responsible for implementing these mitigation measures will be designated in the CEMP. The plans will be adaptive, with the effectiveness of the control measures monitored continuously to identify opportunities for improvement.

A number of construction and demolition sites are considered sensitive, and the presence of an appropriately qualified ecologist during demolition activities, and site establishment will help ensure the minimisation of impacts, and avoidance of offsite impacts to protected matters.

The overall effectiveness of control measures to achieve the desired biodiversity outcomes is considered high, as the measures are largely linked to standard construction management requirements, such as site access control and soil and weed management. Salvage prior to or during construction for fauna and hollow-bearing trees is frequently undertaken in the ACT, and standard procedures are available to ensure these activities are undertaken in an effective manner.

Table 5.23 Measures for Mitigating and Managing Potential Biodiversity Impacts

Measure	Timing	Responsibility	Description	Relevant impact mitigated / desired outcome	Likely effectiveness	Monitoring
Demarcation of approved clearance boundaries (construction footprint)	Prior to clearance during construction	GJV	• All contractors will be informed of the Direct Impact Area boundary and any relevant approval conditions prior to construction commencing.	• Avoidance of inadvertent clearance of BGW, NTG, habitats and other any ecological values adjacent to the Direct Impact Area.	High	• Site audit prior to commencement of construction to confirm clearance boundaries are marked correctly. • Site inductions and regular toolbox talks will reiterate exclusion zones.
Site supervision during construction at sensitive sites.	Construction	GJV	• An appropriately qualified ecologist will be present onsite during site establishment of towers: o With mapped PTWL Habitat o With mapped NTG o With mapped BGW o Requiring removal of hollow bearing trees • An appropriately qualified ecologist will be present onsite during demolition of towers: o Within Nature Reserves.	• Avoidance of site disturbance beyond assessed area • Ensure appropriate barriers and protections are in place to protect adjacent sensitive areas • Minimise disturbance of surface rock • Ensure towers being removed are laid in low sensitivity areas.	High	• Records confirming presence of appropriately qualified ecologist during site establishment and demolition activities.
Fencing and access control	Construction	GJV	• Signage and exclusion fencing will be used during construction to identify areas approved for clearance and areas not to be cleared, and to prevent vehicle access into no-go areas. • Where possible, fencing will not include barbed wire on the top line of the fence.	• Avoidance of inadvertent clearance of BGW, NTG, habitat and other ecological values adjacent to the Direct Impact Area.	High	• Site inductions and regular toolbox talks will reiterate exclusion zones. • Monitoring checklists in the CEMP will include exclusion fencing and checking for evidence of unauthorised access.

Measure	Timing	Responsibility	Description	Relevant impact mitigated / desired outcome	Likely effectiveness	Monitoring
				• Minimisation of impacts on native fauna species by minimising the use of barbed-wire fences.		
Pest plant and animal management	Construction	GJV	• Fauna spotter catchers will be present during the clearing of native vegetation, particularly hollow-bearing trees, to ensure that no live animals or nests are harmed during construction. Tree clearance and lopping will occur outside of the breeding season for superb parrot and gang-gang cockatoo (September to January). • Invasive weeds in the Proposal Area will be managed annually using chemical and/or physical methods in accordance with the ACT Weeds Manual (Southern ACT Catchment Group, 2023). • Pest animals in the Proposal Area will be managed in accordance with the ACT Pest Animal Strategy (ACT Government, 2010), for example: o Control of rabbits, e.g. through warren destruction or poisoning. o Control of feral pigs, e.g. through trapping and/or 1080 baits (if evidence of feral pigs is identified in the Proposal Area, control measures will be agreed with the relevant landholder).	• Management of the risk of fauna mortality and nest disturbance during habitat clearance. • Minimisation of risk of introduction and spread of weeds from the Direct Impact Area into adjacent BGW, NTG, habitats and other ecological values adjacent to the Proposal Area. • Minimisation of risk of impacts from pest animals in the Proposal Area and adjacent habitats.	High	• Monitoring checklists in the CEMP will include regular visual inspections for weed establishment, evidence of pest animals (burrows, scats, other damage) and remedial actions. • During construction, vehicle movement and topsoil management will be the focus of monitoring. • Post construction, rehabilitated areas will be monitored regularly for 12 months, with weeds removed as identified. Following initial establishment, less frequent but regular monitoring will continue. • Where rehabilitation is required within or adjacent to nature reserves, monitoring will extend to 24 months.

Measure	Timing	Responsibility	Description	Relevant impact mitigated / desired outcome	Likely effectiveness	Monitoring
			• Drones will be used to carry new conductors between towers for stringing across sensitive ecological areas, including the Murrumbidgee and Molonglo River corridors and no-go areas.			
***Phytophthora cinnamomi* management**	Construction	GJV	• *Phytophthora cinnamomi* is not known to occur within the Proposal Area. Nevertheless, protocols will be implemented to reduce the potential risk of *Phytophthora cinnamomi* spreading into the Proposal Area or broader landscape, consistent with advice from the EPSDD.	• Minimisation of risk of introduction and spread of *Phytophthora cinnamomi* from the Proposal Area into adjacent box gum woodland.	High	• A monitoring program will be developed concurrently with the development of risk management protocols and will be outlined in the CEMP.
Erosion and sedimentation control	Construction	GJV	• The CEMP will be accompanied by a detailed Erosion and Sediment Control Plan (ESCP) which will build upon the preliminary ESCP attached at **Appendix G3.** • and detail the erosion and sediment controls to be implemented during construction of each component of the Proposal. As discussed in **Section 6.5.1**, the ESCP will detail the erosion and sediment controls to be implemented during Proposal construction, including: o Sediment fences to be installed downslope of areas to be disturbed.	• Minimisation of potential indirect impacts resulting from erosion and sedimentation on BGW, NTG, habitats and other ecological values adjacent to the Proposal Area. • Provides stability of the land surface and downslope water quality.	High	• A program to monitor the effectiveness of the erosion and sedimentation controls will be outlined in the ESCP and will be subject to approval as part of the CEMP. • The effectiveness of erosion controls will be monitored regularly during construction through CEMP monitoring checklists, particularly following rain events. • Post construction monitoring will focus on successful revegetation and stabilisation.

Measure	Timing	Responsibility	Description	Relevant impact mitigated / desired outcome	Likely effectiveness	Monitoring
			○ Stabilised site access points to be installed as required to reduce the tracking of soil material off-site and to provide a stable surface for vehicle access to the construction site. ○ Clean water diversions to be installed as an earth bank upslope of areas to be disturbed. ○ Level spreaders to be installed at the end of the clean water diversions to dissipate concentrated flow paths where required. • The CEMP will also document the controls to be implemented for stockpile and spoil management, including separation of materials/waste types, sediment controls and stabilisation.			
Noise and vibration management	Construction	GJV	• A Construction Noise and Vibration Management Plan (CNVMP) will be developed for the Proposal as a sub-plan to the CEMP. The CNVMP will contain controls for minimising noise and vibration generated during construction which could impact nearby threatened species, such as: ○ Low noise equipment and construction methodologies to be selected where possible. ○ Equipment and vehicles to be turned off when not in use.	• Minimisation of potential indirect impacts resulting from noise and vibration on fauna adjacent to the Proposal Area	High	• A program to monitor the effectiveness of the noise and vibration controls will be outlined in the CNVMP and will be subject to approval as part of the CEMP. • Effectiveness of noise and vibration controls will be monitored regularly during construction through CEMP monitoring

Measure	Timing	Responsibility	Description	Relevant impact mitigated / desired outcome	Likely effectiveness	Monitoring
			o Equipment and vehicles to be regularly serviced in accordance with manufacturer requirements. o Acoustic covers on machine engines to remain closed at all times. o Plant to be located and orientated to direct noise away from sensitive habitats where possible. o Noisy machinery to not be operated simultaneously or in a concentrated location where possible (e.g. for earthmoving and ground-impacting operations). In particular, overlapping construction stages will be undertaken in different locations of the Proposal Area to minimise impacts on sensitive habitats. o Reversing of vehicles and plant to be avoided where possible, to minimise the noise emitted from reverse alarms.			checklists, particularly during spring which coincides with the breeding season of threatened bird species.
Site rehabilitation	Progressively throughout construction and at completion of construction	GJV	• The CEMP will include a Site Rehabilitation Plan that details how the Proposal Area will be progressively rehabilitated throughout construction, including through the re-seeding of native grasses.	• Rehabilitation of impacted areas.	High	• The Site Rehabilitation Plan will outline the program to monitor the effectiveness of rehabilitation works against the defined management objectives.

Measure	Timing	Responsibility	Description	Relevant impact mitigated / desired outcome	Likely effectiveness	Monitoring
						• Any improvement in the condition of the site will be measured against baseline conditions, which will be established prior to commencement of rehabilitation works. • Rehabilitation works will be monitored for a set period to ensure successful revegetation and stabilisation.

5.7 Residual Risk Assessment

The residual risk assessment in **Table 5.24** provides revised risk ratings with consideration of the mitigation and management measures discussed in **Section 5.6.2**. Residual risk ratings range from very low to very high, with all risks able to be reduced to ALARP. However, some significant residual risks remain.

Significant residual risks associated with the Proposal relate to impacts on native vegetation, including TECs and threatened species habitat, which have been unable to be completely avoided through Proposal design, and potential cumulative impacts with other developments in the area.

Table 5.24 Residual Assessment of Risks Associated with Biodiversity

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Design								
B1	The location of the Proposal leads to unavoidable removal of threatened ecological communities and/or threatened species habitat.	Very high	Yes	• The location and design of the new alignments have been developed through an iterative options assessment process over several years to reduce environmental, cultural, and social impacts. This has resulted in the avoidance and minimisation of several key ecological values, including BGW, NTG, PTWL habitat, and mature hollow-bearing trees. Further reductions in impacts are not considered practicable or possible in some areas (e.g. in the constrained infrastructure corridor adjacent to Stockdill Drive where woodland occurs). • Compensatory planting and rehabilitation commitments have been made for unavoidable residual impacts.	Almost certain	Moderate	Very high	Yes
B2	Presence or extent of threatened species habitat or ecological communities or other protected matters (e.g. native vegetation) is not identified prior to the design being finalised, resulting in unanticipated impacts.	Low	No	• Ecological field surveys have been undertaken over the past several years to identify constraints and opportunities for redesign to avoid high ecological values. For some species, multiple years of surveys have also been undertaken (e.g. GSM, Austral toadflax). As such, it is considered	Remote	Moderate	Very low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				highly unlikely that new ecological values are identified post-approvals.				
B3	Cumulative biodiversity impacts occur as a result of the Proposal and other developments in the region.	Medium	Yes	• Impacts on native vegetation including TECs and threatened species habitat have largely been avoided through the refinement of the location and design of the new alignments. • The CEMP will include a Site Rehabilitation Plan that details how the Proposal Area will be progressively rehabilitated throughout construction, including through the re-seeding of native grasses. This will include a rehabilitation monitoring program for measuring the effectiveness of the rehabilitation activities. • Potential cumulative biodiversity impacts will be further mitigated through the implementation of the CEMP (refer to the mitigations provided for B6–B10 for more detail).	Possible	Moderate	Medium	Yes
B4	If required, an appropriate offset site is unable to be identified or established in the ACT.	Medium	No	• N/A The Project will not require Offsets. • Compensatory Planting and Compensatory Research will be undertaken by the Proponent.	Remote	Minimal	Negligible	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Construction								
B5	The area of disturbance exceeds the area assessed and approved, resulting in non-compliance with the PD Act/Planning Act approvals (and/or EPBC Act if relevant).	Medium	No	• Industry best practice CEMP will be implemented that documents the approved disturbance area and identifies controls for ensuring that the boundary is clearly demarcated on site using signage and exclusion fencing. • Site workers will be inducted into the CEMP and will be informed of the approved clearance boundaries. • Pre-clearing surveys will be undertaken to demarcate the clearing boundaries. • Supervision by an appropriately qualified ecologist will be undertaken at sensitive construction and demolition sites.	Unlikely	Minor	Very low	Yes
B6	Clearing of a threatened ecological community and/or threatened species habitat leads to a loss of biodiversity in the region.	Medium	No	• Impacts on TECs and threatened species habitat have largely been avoided through the refinement of the location and design of the new alignments. • The CEMP will include a Site Rehabilitation Plan that details how the Proposal Area will be progressively rehabilitated throughout construction, including through the re-seeding of native grasses. This will include a rehabilitation monitoring program for measuring the effectiveness of the rehabilitation activities.	Unlikely	Moderate	Low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				• Tree clearance and modification will occur outside of the breeding season for superb parrot and gang-gang cockatoo (September to January).				
B7	Construction activities injure or kill threatened fauna.	Medium	No	• Fauna spotter catchers will be present during the clearing of native vegetation to ensure that no live animals or nests are harmed as a result of the Proposal. Specific requirements for the fauna spotter catcher will be outlined in the CEMP. • Tree clearance and modification will occur outside of the breeding season for superb parrot and gang-gang cockatoo (September to January).	Unlikely	Moderate	Low	Yes
B8	Clearing of native vegetation results in a loss of connectivity or increased fragmentation in the landscape, and/or obstruction of local movement corridors for threatened fauna.	High	No	• Impacts on native vegetation have largely been avoided through the refinement of the location and design of the new alignments. This has resulted in the avoidance and minimisation of several key ecological values, including BGW, NTG, PTWL habitat, and mature hollow-bearing trees, which has subsequently reduced impacts relating to habitat connectivity and fauna movements throughout the landscape.	Likely	Minor	Medium	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				• The residual loss of movement trees for superb parrot and gang-gang cockatoo are considered unavoidable.				
B9	Land disturbance during construction results in the spread of invasive species off site.	Medium	No	• Drones will be used to carry new conductors between towers for stringing across sensitive ecological areas, including the Murrumbidgee and Molonglo River corridors and no-go zones. • The CEMP will include measures for managing pest animals and weeds in the Proposal Area, including: o Pest animals in the Proposal Area will be managed consistent with the ACT Pest Animal Strategy (ESD, 2012), for example: ▪ Control of rabbits, e.g. through warren destruction or poisoning. ▪ Control of feral pigs, e.g. through trapping and/or 1080 baits (if evidence of feral pigs is identified in the Proposal Area, control measures will be agreed with the relevant landholder).	Unlikely	Moderate	Low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				o Protocols will be developed to address site specific risks of spread or infection associated with *Phytophthora cinnamomi* and will be informed by advice from the EPSDD. o Any invasive weeds in the Proposal Area will be managed using chemical and physical methods as appropriate, in accordance with the ACT Weeds Manual (Southern ACT Catchment Group, 2023). • The CEMP will include a detailed ESCP (which builds upon the preliminary ESCP in **Appendix G3**) that documents the controls to be implemented to minimise and manage erosion and sedimentation and to contain sediment-laden runoff. All areas of disturbance will have the following standard erosion and sediment controls (refer to the mitigations provided for S1, **Section 6.6** for more detail): o Sediment fence to be installed downslope of areas to be disturbed.				

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				○ Stabilised site access points to be installed as required to reduce the tracking of soil material off-site and to provide a stable surface for vehicle access to the construction site, involving the use of aggregate or recycled concrete along the access track surface and earth bunds to divert stormwater runoff to a sediment trap. ○ Clean water diversions to be installed as an earth bank upslope of areas to be disturbed. ○ Level spreaders to be installed at the end of the clean water diversions to dissipate concentrated flow paths where required. • The CEMP will document the controls to be implemented for stockpile and spoil management, including separation of materials/waste types, sediment controls and stabilisation. Refer to the mitigation measures provided for S1 (**Table 6.3**, **Section 6.6**) for further information about spoil management.				

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				• The CEMP will include a Site Rehabilitation Plan that details how the Proposal Area will be progressively rehabilitated throughout construction, including through the re-seeding of native grasses. This will include a rehabilitation monitoring program for measuring the effectiveness of the rehabilitation activities.				
B10	Noise, vibration, lighting, dust, waste, and erosion and sedimentation cause impacts on threatened species.	Low	No	• A Construction Noise and Vibration Management Plan (CNVMP) will be developed for the Proposal as a sub-plan to the CEMP. The CNVMP will contain controls for minimising noise and vibration generated during construction which could impact nearby threatened species, such as (see also the mitigations provided for N1, **Section 10.6** for more detail): o Low noise equipment and construction methodologies to be selected where possible. o Equipment and vehicles to be turned off when not in use. o Equipment and vehicles to be regularly serviced in accordance with manufacturer requirements. o Acoustic covers on machine engines to remain closed at all times.	Unlikely	Minor	Very low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				○ Plant to be located and orientated to direct noise away from sensitive habitats where possible. ○ Noisy machinery to not be operated simultaneously or in a concentrated location where possible (e.g. for earthmoving and ground-impacting operations). In particular, overlapping construction stages will be undertaken in different locations of the Proposal Area to minimise impacts on sensitive habitats. ○ Reversing of vehicles and plant to be avoided where possible, to minimise the noise emitted from reverse alarms. • The use of on-site lighting during construction will be limited to times when staff are on site and there is insufficient natural light for maintaining safe working conditions. Lighting during Proposal operation will be limited to times when maintenance work is being undertaken on site. • On-site lighting will be directed towards the Proposal Area and away from sensitive receptors.				

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				• The CEMP will include measures for mitigating and managing potential biodiversity impacts caused by dust emissions, such as: o Civil works to be staged to minimise areas of exposed soil, where practicable. o Silt and other materials to be removed from around any sediment and erosion control structures to prevent the deposits from becoming a dust source. o Vehicle speeds to be limited on any unsealed/non-gravelled areas. o Trucks to be covered when carrying dry earth material such as spoil. o Site entrances to be cleaned as needed to prevent the build-up of soil that could become airborne. o Dust generating activities to cease during high winds until dust suppression can be undertaken.				

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				o Dust suppression to be used on exposed soil and/or stockpiles to control any visible dust plumes. Water or similar (e.g. Spraygrass) would be used. Refer to the mitigation measures provided for S1 (**Table 6.3**, **Section 6.6**) for further information about spoil management. • The CEMP will include a detailed ESCP that documents the controls to be implemented to minimise and manage erosion and sedimentation and to contain sediment-laden runoff. Refer to the mitigation measures provided for S1 (**Table 6.3**, **Section 6.6**) for further information (also partially replicated for B9).				
B11	Cumulative biodiversity impacts occur as a result of the Proposal construction and other developments in the region.	Medium	Yes	• Impacts on native vegetation including TECs and threatened species habitat have largely been avoided through the refinement of the location and design of the new alignments. • The CEMP will include a Site Rehabilitation Plan that details how the Proposal Area will be progressively rehabilitated throughout construction, including through the re-seeding of native grasses. This will include a rehabilitation monitoring program for	Possible	Moderate	Medium	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				measuring the effectiveness of the rehabilitation activities. • Potential cumulative biodiversity impacts will be further mitigated through the implementation of the CEMP (refer to the mitigations provided for B6–B10 for more detail). • The CEMP will outline a program to monitor the effectiveness of rehabilitation works against the pre-clearance state of the Proposal Area. Any improvement in condition of the site will be measured against baseline conditions, which will be established prior to commencement of rehabilitation works.				
B12	Construction of access tracks results in connectivity barriers, and/or obstruction of movement corridors for fauna.	Very low	Yes	• Access tracks coincide with existing farm access tracks wherever possible. New tracks are marked on relevant maps. Limited vegetation clearance would be required, due to siting of these tracks. Tracks would not create any barriers in the environment beyond what is already present.	Unlikely	Minor	Very Low	Yes
B13	Demolition of existing towers results in biodiversity impacts in rural areas and nature reserves	Low	No	• Within Nature Reserves: o Existing tracks to be utilised to access towers. o Towers to be removed without any vegetation modification.	Unlikely	Minor	Very Low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				o Towers are to be laid down and dismantled in areas with no ecological value, to be confirmed by on-site ecologist. o Concrete footings to be retained in situ to prevent any ground disturbance. • Within rural and future urban areas: o Existing tracks to be utilised to access towers. o Towers to be removed without any vegetation modification. o Erosion and sediment control to be established around excavation area o Excavation around concrete footings to be minimised o Fill to be replaced back into hole, and clean fill to be utilised for any deficit o Disturbed areas to be reseeded with equivalent grass mix to surrounding vegetation.				
Operation								
B14	Proposal Area becomes infested with weeds, leading to increased risk to off-site areas.	Medium	No	• The Site Rehabilitation Plan will outline a program to monitor the effectiveness of rehabilitation works against the pre-clearance state of the Proposal Area.	Unlikely	Minor	Very low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				Any improvement in condition of the site will be measured against baseline conditions, which will be established prior to commencement of rehabilitation works. • The Site Rehabilitation Plan will be adaptive, so that any decline in condition which can be clearly attributed to the Proposal, and appropriate reparation actions, are able to be identified and implemented. The Site Rehabilitation Plan will outline triggers for reparation. • *Phytophthora cinnamomi* is not known to occur within the Proposal Area. Nevertheless, protocols will be implemented to reduce the potential risk of *Phytophthora cinnamomi* spreading into the Proposal Area or broader landscape, consistent with advice from the EPSDD.				
B15	Non-compliance with Offset Management Plan (if required) and/or approval conditions, inadequate management of offset site, or failure of offset site leads to Proposal financial and reputational issues, and environmental losses.	High	No	• N/A The Project will not require Offsets.	Remote	Minimal	Negligible	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
B16	Operation of the transmission lines results in line collision by birds, particularly over river crossings	Low	No	• Flagging over river corridors may be considered retrospectively if bird fatality is observed, however no evidence currently to suggest this mitigation measure is required. • Monitoring program to be implemented to inform any additional measures.	Possible	Minor	Low	No
B17	Operational maintenance of new towers results in impacts to avoided areas of environmental sensitivity.	Medium	No	• Mapping of sensitive sites (in particular location of NTG) is to be provided to Transgrid to ensure ongoing avoidance by maintenance personnel	Unlikely	Moderate	Low	Yes

5.8 Offsets and Other Compensatory Measures

The Proposal was submitted to the Commonwealth stating that residual impacts to superb parrot and gang-gang cockatoo had the potential to be significant. DCCEEW undertook their assessment, and determined the Proposal to be not a controlled action. As such, offsets are not proposed.

Rehabilitation commitments have been requested by the Conservator of Flora and Fauna, specific to pink-tailed worm-lizard, and natural temperate grassland, as well as compensatory planting for superb parrot and gang-gang cockatoo.

5.8.1 Compensatory Planting

Impacts to native vegetation and the loss of foraging habitat as a result of the Project may be compensated for through replanting in close proximity to the Proposal Area, within rural leases, and within the nearby Ginninderry Conservation Corridor. As compensation for the loss of vegetation within Wagtail Park (Blocks 1601 and 1602) it has already been agreed to replant trees ranging in maturity to support and encourage habitat for migrating and woodland bird species known to inhabit the area. In addition to this planting, areas previously subject to vegetation management within easements will be targeted for revegetation to realise biodiversity benefits of the line relocation. This replanting will help to compensate for cumulative vegetation loss across the Proposal Area.

It is proposed that tree planting ratios, to be determined at the DA stage through the BSUD process consider commitments already entered into with landowners. Replanting foraging species for superb parrot and gang-gang cockatoo in appropriate locations would be determined in consultation with the landowners, Parks and Conservation Service, Ginninderry Conservation Trust and the Conservator of Flora and Fauna. The existing structure and composition of habitat will be replicated as far as possible, including a mix of Blakely's red gum and yellow box (approx. 1:10 ratio of yellow box to Blakely's red gum).

Any compensatory planting would be subject to a maintenance period of 12 months to ensure success. Any action within or adjacent to a Nature Reserve will increase monitoring and weed management to a period of 24 months, to coincide with the weed management work completed by PCS in the adjoining public reserve.

These compensatory measures would aim to contribute to existing landscaping and canopy restoration projects, with the aim of improving habitat connectivity and foraging opportunities within the landscape.

5.8.2 Rehabilitation

Natural Temperate Grassland

Impacts to the buffer of the natural temperate grassland patch off Stockdill Drive will be compensated for through a 3:1 replacement ratio of native grassland planting. This will be undertaken directly adjacent to the existing patch, either to rehabilitate the impacted area of exotic grassland buffer, or to expand the patch on another edge. The placement will be dependent upon the final landform post construction.

The impact to natural temperate grassland and its buffer zone is a total of 0.35 ha (0.01 ha of natural temperate grassland ACT01.1, 0.28 ha of ACT 01.4, and 0.06 ha of exotic vegetation). A restoration of 1.05 ha of reseeding with a native grassland mix and native forbs, with associated weed management and monitoring of 12 months would be committed to by the GJV.

Depending upon the final location of the restoration, if it falls within or adjacent to a Nature Reserve, the commitment will include weed management for a period of 24 months, to coincide with the weed management work completed by PCS in the adjoining public reserve..

Pink-Tailed Worm Lizard

The replacement of pink-tailed worm lizard habitat at a ratio of 3:1, through strategic placement of habitat rocks and the establishment of native grassland species will be committed to by the GJV. The Conservator of Flora and Fauna has requested that this habitat replacement occurs within Nature Reserves and existing offsets. The GJV will undertake this activity with salvaged habitat rock, and reseeding with native grass and forb species, with associated weed management and monitoring for a period of 24 months.

A total of 1.09 ha of pink-tailed worm lizard habitat will be impacted by the Proposal, which will require 3.27 ha of habitat replacement. Locations will be determined as part of the DA process, in consultation with the Conservator of Flora and Fauna and the Parks and Conservation Service.

5.8.3 Investment in Research

Gang-Gang Cockatoo

To understand gang-gang cockatoo's utilisation of this area, and to examine different techniques associated with the provision of nesting sites in existing habitat areas, it is proposed that research is funded prior to construction. The investment in research as a compensatory measure is proposed to include hollow inspections during the breeding season, and continued observation throughout the season to determine fledgling success, if applicable.

During revision of this EIS, the Proponent engaged subject matter expert, Stuart Rae, to undertake targeted bird surveys during the Spring 2025 breeding season of the impacted trees, and immediate surroundings, in addition to detailed re-inspection of previously identified hollows by Alexander Jardine of Heartwood Habitat. The outcome of these surveys identified the presence of common bird species utilising hollows of tree 86, but no evidence of gang-gang cockatoo or superb parrot use. Tree 87, 89 and other trees within the vicinity did not contain occupied hollows. During the surveys no gang-gang cockatoos were observed within 500 m of tree 86, 87 or 89.

Based on this survey, it is not considered a critical habitat tree for gang-gang cockatoo. This report is provided as **Appendix J**.

The GJV will undertake compensatory planting for the species, as described above, and will continue to monitor this tree until the construction program mandates it's removal. They are open to supporting additional relevant research in a manner that is reasonable and commensurate with the project scope.

Collision Risk

The risk of bird collision with overhead lines has been assessed as low, with mitigation measures able to be retrofitted post construction in response to monitoring.

To ensure the requirement for additional mitigation measures is appropriately understood, and to inform future transmission projects within the ACT, it is proposed that a collaborative approach between the ACT Government and the GJV be undertaken as detailed below, with consideration of the *Post-Construction Bird and Bat Fatality Monitoring for Onshore Wind Energy Facilities in Emerging Market Countries: Good*

Practice Handbook and Decision Support Tool (IFC, 2023), in response to the Conservator of Flora and Fauna's comments on the Revised EIS.

Pre Construction – ACT Government

- Purpose: Document existing data held by the ACT Government to establish base line data on collisions. If required, detect impacts (fatalities) and inform adaptive management from base line data and detected impacts from local area.
- Method: Collation of existing data or / and systematic walking searches.
- Area: If required, 20–30 m corridor under selected line spans (for example, near river crossings or areas of foraging habitat).
- Frequency: If required monthly, reduced to fortnightly in high-risk periods.
- Duration: As required prior to construction commencement.
- Data: Species, location, condition, photos.
- Output: Baseline data for bird collision risk with ACT Transmission lines.

Post Construction – Ginninderry Joint Venture

- Purpose: Detect impacts (fatalities) and inform adaptive management and application of mitigation measures.
- Method: Systematic walking searches.
- Area: 20–30 m corridor under selected line spans (for example, near river crossings or areas of foraging habitat).
- Frequency: Monthly, reduced to fortnightly in high-risk periods (for example, January and February generally record the most observations of white-throated needletail in the ACT, while also corresponding to the breeding season for gang-gang cockatoo).
- Duration: 12 months.
- Data: Species, location, condition, photos.
- Output: Monitoring summary and mitigation measure review.

It should be noted that as a result of the project there is a net reduction in the length of transmission lines within the landscape with the existing lines running for 12.3 km and the proposed lines running for 11.3 km. If collision risk is an issue the fact that the project results in a net reduction in transmission lines present within the landscape is a positive outcome of the project towards reducing potential bird collisions with overhead lines.

6.0 Soil and Contamination

Chapter Summary
This chapter provides an assessment of potential impacts of the Proposal on soils within and surrounding the Proposal Area. It also discusses potential sources of contamination in the Proposal Area and contamination risks associated with the Proposal.

6.1 Preliminary Risk Assessment

An assessment of Proposal risks associated with soil and contamination is provided in **Table 6.1**. The risk ratings range from low to high, with significant impacts possible from activities that could lead to erosion and sedimentation if not appropriately mitigated and managed.

Section 6.2 to **Section 6.4** provide a detailed assessment of these risks. The residual risk assessment in **Section 6.6** provides revised ratings for each risk based on the mitigation and management measures described in **Section 6.5**.

Table 6.1 Preliminary Assessment of Risks Associated with Soil and Contamination

ID	Risk Scenario	Preliminary Risk Assessment			
		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Construction					
S1	Construction activities such as vegetation clearance, civil works and tower demolition increase erosion and sedimentation, leading to soil degradation.	Likely	Moderate	High	No
S2	Fuel or chemical spills, or disturbance of existing contaminated material, lead to soil contamination which could result in environmental degradation and fines under the EP Act.	Unlikely	Moderate	Low	No

6.2 Investigations

Douglas Partners (2024) has prepared a Preliminary Site Investigation (PSI) report (see **Appendix G2**) which identifies potential sources of contamination that may exist in the Proposal Area. The PSI involved a review of desktop information including soil and geological mapping, the ACT Groundwater Abstraction Bore Register, the EPA's Contaminated Land Register and historical aerial photography, followed by a site walkover.

Desktop reviews of publicly available databases were also undertaken to identify existing soil, geological and contamination conditions in the Proposal Area and surrounds. The data sources listed in **Table 6.2** informed preparation of the PSI and this EIS chapter.

The mitigation and management measures described in this chapter for erosion and sedimentation control were informed by a preliminary Erosion and Sediment Control Plan (ESCP) (Umwelt, 2023), which details relevant drainage, erosion and sediment controls that are anticipated to be implemented during construction of the Proposal. The ESCP was prepared with reference to Chapter 5 of the Environment Protection Guidelines for Construction and Land Development in the ACT (EPA, 2022a), Volumes 1 and 2 of the NSW Managing Urban Stormwater – Soils and Construction (NSW Government, 2004), and Best Practice Erosion and Sediment Control (IECA, 2012). A detailed ESCP is typically prepared as part of the DA process, but an ESCP was instead prepared for this EIS to satisfy some of the scoping requirements, as outlined in **Appendix C**. As the detailed design, construction methodology and works staging have not yet been finalised for the Proposal, the ESCP is only a preliminary plan and will be further developed for the DA. The preliminary ESCP is attached at **Appendix G3.**

Table 6.2 Data Sources Used for the PSI and This EIS Chapter

Data source	Description
ACTmapi Soil and Hydrogeological Landscapes database (ACT Government)	Provides soil and hydrogeology information on the ACT.
Soil Landscapes of the Canberra 1:100 000 Sheet maps	Provides an inventory of soil and landscape properties of the ACT and identifies major soil and landscape qualities and constraints.
Australian Soil Resource Information System (ASRIS)	Provides soil and land use data. Used to obtain regolith mapping from the Commonwealth Scientific and Industrial Research Organisation (CSIRO).
NSW Department of Planning, Industry and Environment eSPADE website	Provides soil information for NSW and the ACT. Used to obtain hydrogeological and acid sulfate soil mapping.
Geoscience Australia database	Provides a range of data relating to geology, geomorphology, hydrology and minerals. Used to obtain geology information.
MinView (NSW Government)	Provides geological data.
Historical aerial photographs from public databases, e.g. ACTmapi, Google Earth	Used to inform the identification of potential sources of contamination in the Proposal Area.
ACT EPA's register of contaminated sites	Provides a register of contaminated sites in the ACT.
ACT public register of environmental authorisations	Provides a register of environmental authorisations that have been provided for activities that pose an environmental risk (see **Section 3.1.1.4** for more information).

6.3 Existing Conditions and Values

6.3.1 Soils and Geology

The Proposal Area sits within the low hills and plains landscapes of the ACT, where the topography ranges between approximately 437 m Australian Height Datum (mAHD) at its lowest point at the crossings of the Molonglo and Murrumbidgee Rivers, to a maximum of approximately 620 mAHD at its eastern extent, and approximately 584 mAHD at its western extent.

The Proposal is underlain by the Walker Volcanics, based on the NSW Government MinView mapping tool (Department of Regional NSW, 2024) (see **Figure 6.1**). The Walker Volcanics formed in the Llandovery Age, 443.8–433.4 million years ago. They are characterised by tuff (a type of volcanic ash ejected from a vent during a volcanic eruption) and ignimbrite (hardened tuff), some andesite (similar to basalt), interspersed with limestone, shale and siltstone (Department of Regional NSW, 2024).

The Proposal Area is located within the Uriarra Road Hydrogeological Landscape (HGL), which covers an area of approximately 15,900 ha. The Murrumbidgee and Molonglo Rivers are incised into the sodosols of the mid-section of the HGL (DPIE, 2017) (sodosols are soils that are generally nutrient poor with a high concentration of sodium and are very vulnerable to erosion). Slopes are steep in the gorges, and soils tend to be shallow with leptic tenosols on crests and slopes (DPIE, 2017) (tenosols are typically very sandy and nutrient poor, and leptic means that there is continuous rock within 1 m of the surface).

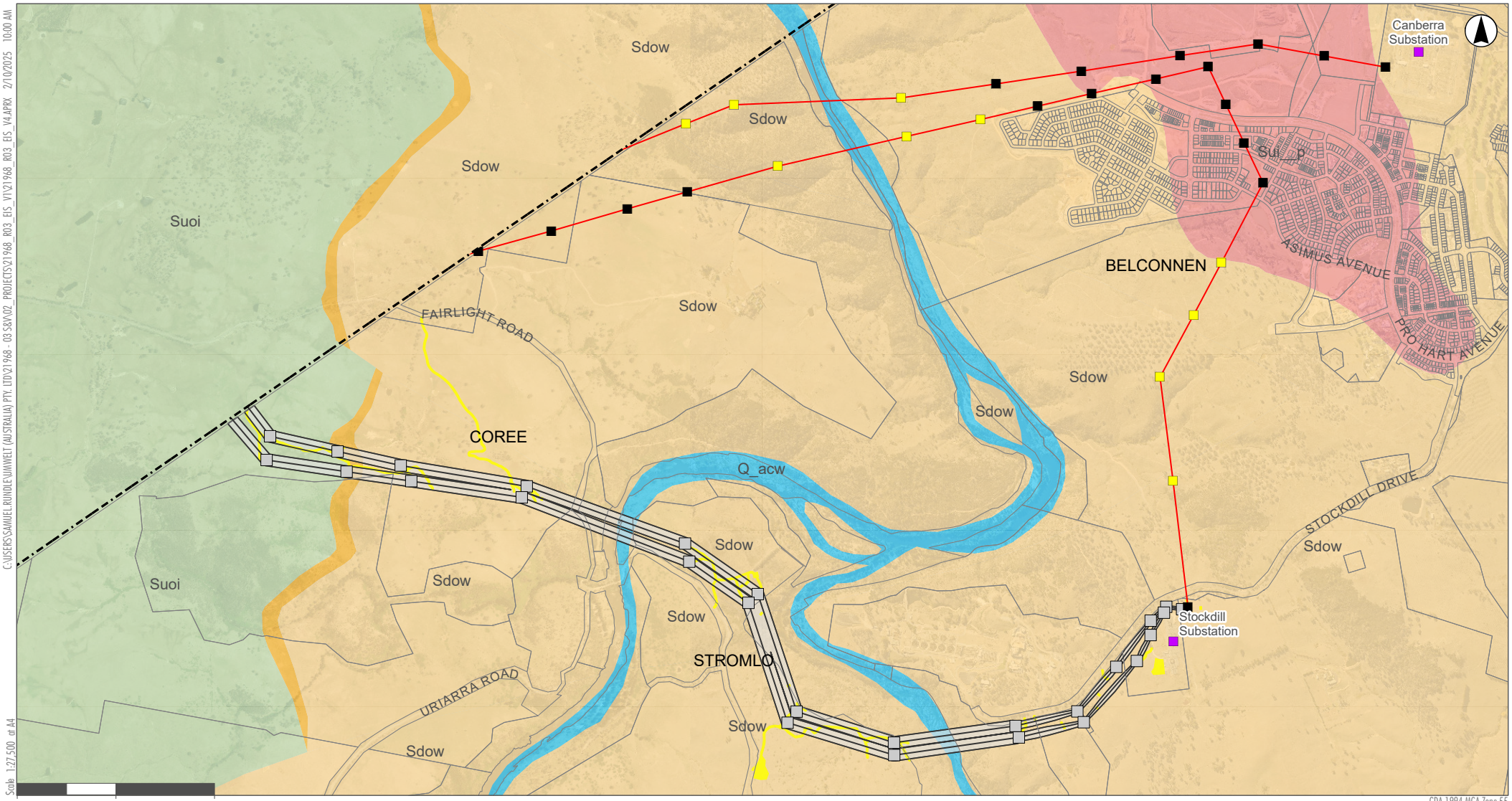
Reference to the Soil Landscapes of the Canberra 1:100 000 Sheet 8727 indicates that the Proposal Area is located across four different soil groups, although impacts would only occur on the Burra and Campbell soil groups (see **Figure 6.2**). The Burra soil group is characterised by undulating to rolling low hills and alluvial fans on Silurian volcanics. Soils are shallow and well drained on crests and upper slopes, moderately deep and moderately well-drained on midslopes, and moderately deep and slowly to moderately well-drained along minor drainage lines and on some lower slopes. This soil group is limited by its strongly acid soils with low fertility and low available water holding capacity. Subsoils have low permeability and subject to a moderate erosion risk. The Campbell soil group is characterised by steep to rolling rounded hills and mountains on Silurian volcanics and sediments. Soils are shallow and range from poorly drained to well-drained depending on their location within the landscape.

Acid sulfate soils are not predicted to occur in the Proposal Area or surrounding landscape, based on eSpade mapping from the NSW Government.

6.3.2 Contamination

The ACT Register of Contaminated Sites indicates that there is a single land parcel within the Proposal Area that is registered under the EP Act as a contaminated site. The registration is for the West Belconnen Resource Management Centre on Block 1586 Belconnen, which is now the site of the Canberra Sand and Gravel West Belconnen Resource Management Centre. The block is also subject to a current environmental authorisation registered under the EP Act for the operation of a commercial landfill facility and the placement of soil.

A single tower on Line 7 is located on the southern boundary of Block 1586 Belconnen, which would be removed by the Proposal. This tower is located outside of the fence around the resource management centre in an area that is not subject to resource management (see **Plate 6.1**). This area is subject to a site audit statement, including requirements for any earthmoving activities. Following removal of concrete footings, excavated soil would be replaced into the excavation, and topped with clean fill if required. All activities within this area would be subject to existing procedures for the site, in addition to an Unexpected Finds Protocol, which would be part of the CEMP required at the DA stage. We note the recent construction of the Southern Pathway Break, involving very deep excavation in this area was subject to similar requirements.



Legend

- Demolition Sites
- Tower Foundations to be Left In Situ
- New Alignments
- Transmission Lines to be Removed
- Construction Footprint
- Existing Substation
- Property Boundaries
- ACT/NSW Border

Seamless Geology - Rock Units

- Alluvial channel deposits - subaqueous (Q_acw)
- Tarpaulin Creek Ashstone Member (Suoit)
- Unassigned Silurian intrusions - porphyry (Sui__p)
- Uriarra Volcanics (Suoi)
- Walker Volcanics (Sdow)

FIGURE 6.1
Geology

Image Source: Nearmap (2022) Data source: ACT Government (2021)

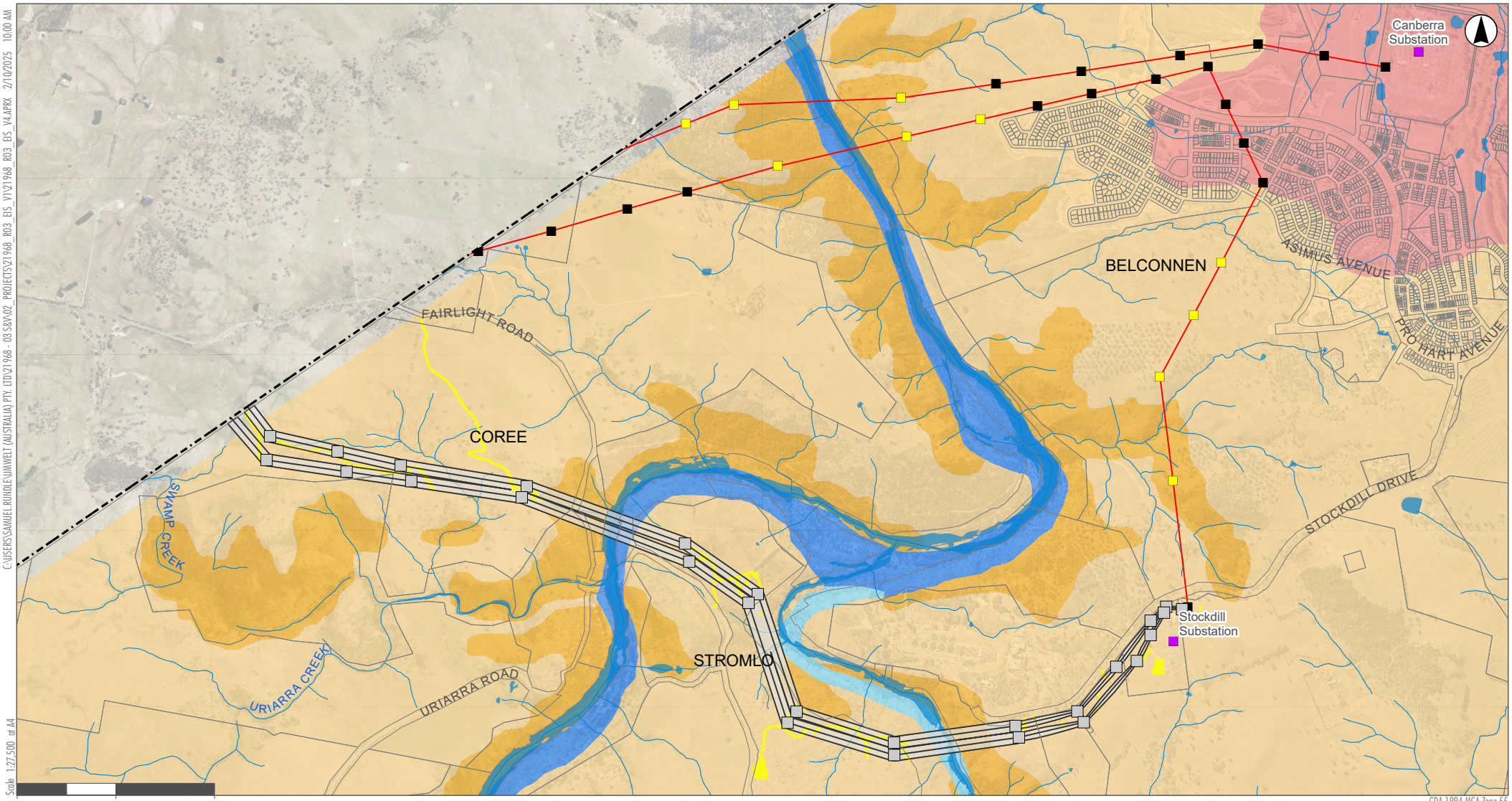


FIGURE 6.2
Soil Landscapes

Image Source: Nearmap (2022) Data source: ACT Government (2023)

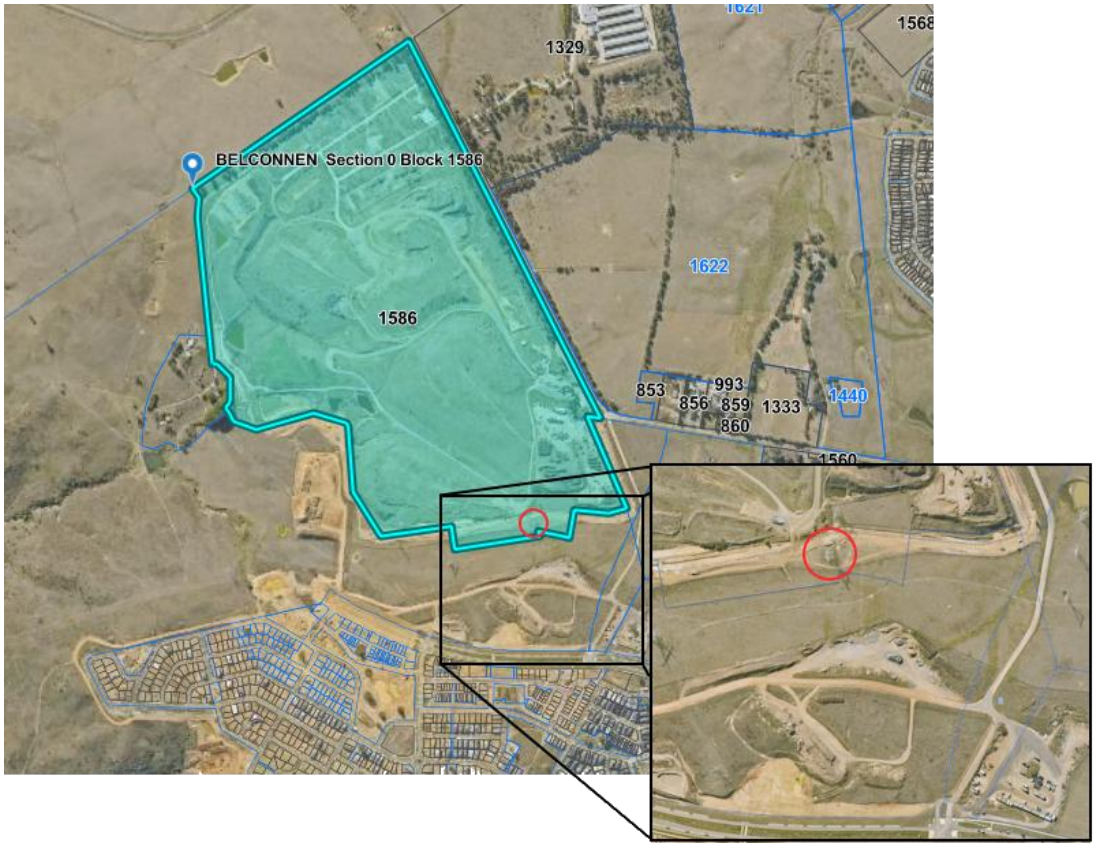
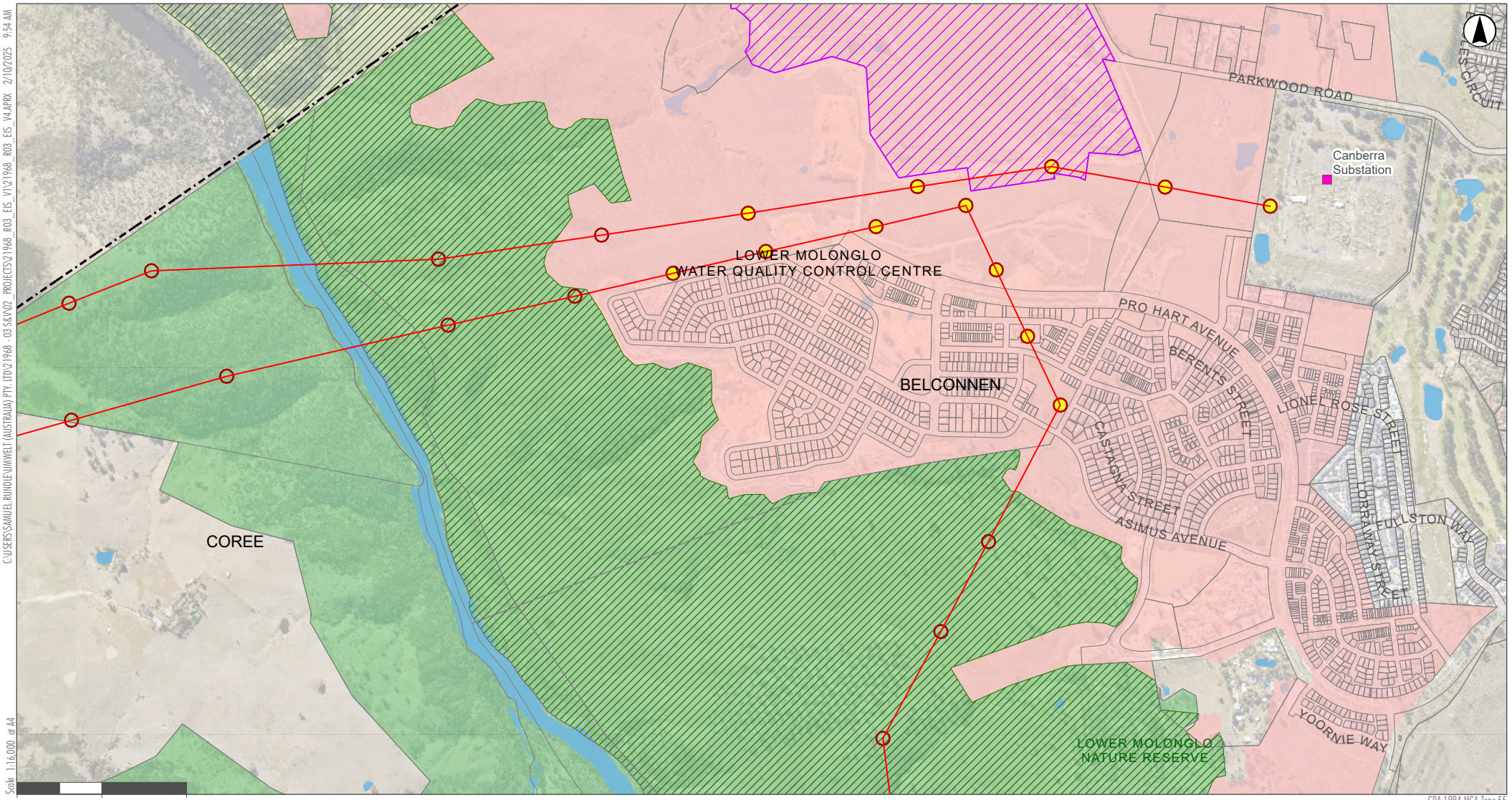


Plate 6.1 Tower to be Removed on Block 1586 Belconnen near the Canberra Sand and Gravel West Belconnen Resource Management Centre (modified from ACTmapi, 2025)

The PSI (**Appendix G2**) concluded that the potential for gross chemical contamination within the Proposal Area is low. However, some isolated sources of contamination (potential and known) were identified in the Proposal Area, as shown in **Figure 6.3**):

- Fill on Blocks 1614, 1602 and 1461 Belconnen along the new alignments east of the Molonglo River, potentially originating from historical construction, fly-tipping (illegal dumping of waste) and agricultural activities, potentially associated with contamination from metals (e.g. arsenic and cadmium); total recoverable hydrocarbons (TRH); benzene, toluene, ethylbenzene, xylene (BTEX); polycyclic aromatic hydrocarbons (PAH); organochloride pesticides (OCP); phenols and asbestos.
- Potential PFAS on Block 1614 Belconnen (along the new alignments east of the Molonglo River) that may have migrated from the adjacent LMWQCC site and/or been caused by legacy firefighting practices in the area.
- Potential historic and ongoing agricultural pesticide use across the entire Proposal Area, potentially associated with contamination from metals, OCP and organophosphorus pesticides (OPP).
- Historic plunge sheep dip on Block 487 Stromlo (along the new alignment between the Murrumbidgee and Molonglo Rivers).
- Potential hazardous building materials associated with existing towers, footings and transmission lines which could contain lead (in paint), asbestos, PCBs (persistent organic pollutants that are toxic and persist in the environment where they can bioaccumulate in animals), and synthetic mineral fibres.



Legend

- Tower Locations Requiring Intrusive Investigations
- Existing Substation
- New Alignments
- Transmission Lines to be Removed
- Construction Footprint
- Property Boundaries
- ACT/NSW Border
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Watercourses
- Nature Reserves

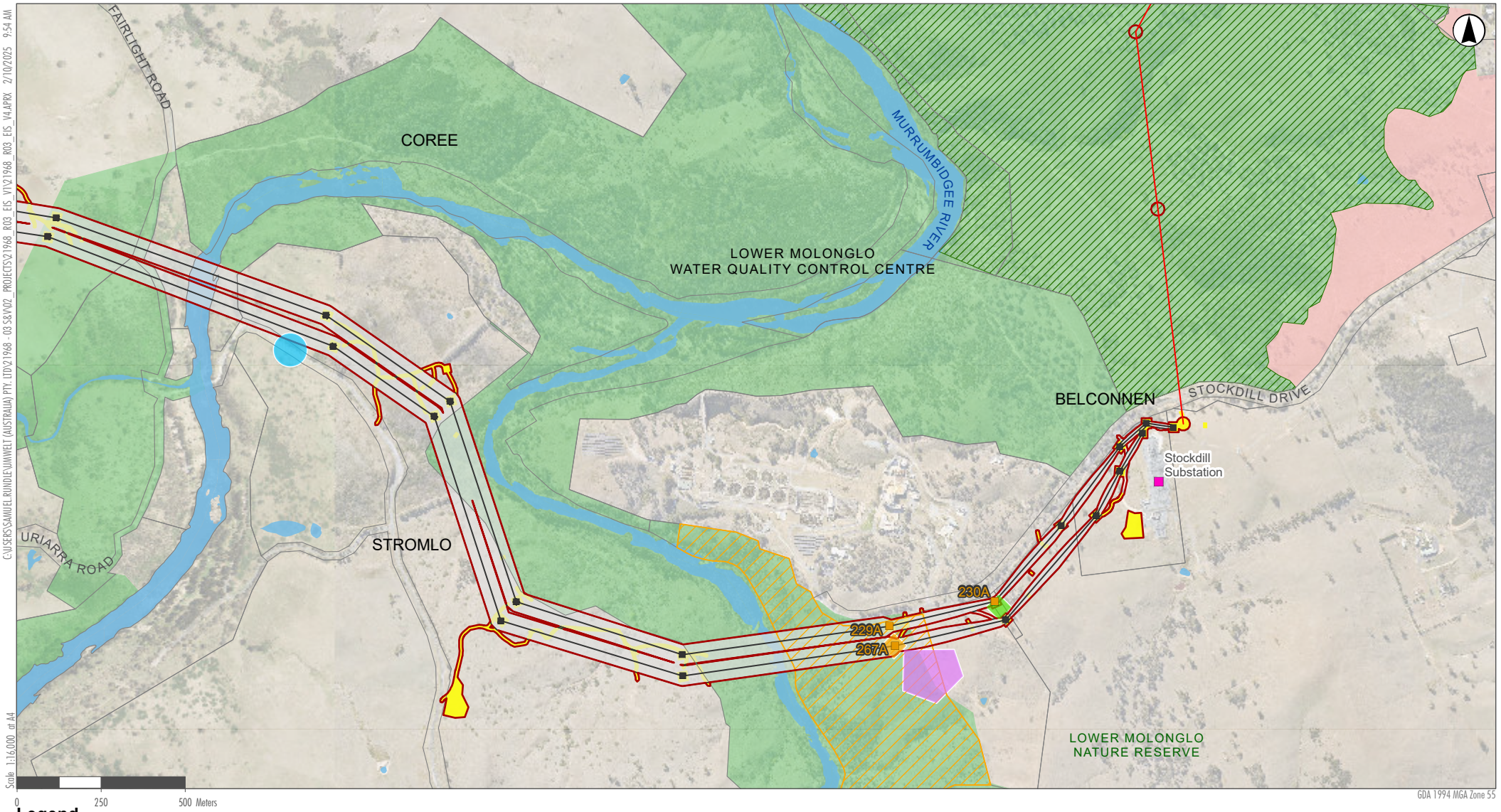
Potentially Contaminated Sites

- Block 1586 Belconnen (West Belconnen Resource Management Centre)

FIGURE 6.3A

Potential Sources of Contamination in the Proposal Area

Image Source: Nearmap (2022) Data source: ACT Government (2023)



Legend

- Tower Locations Requiring Intrusive Investigations
- Existing Substation
- New Alignments
- Transmission Lines to be Removed
- Construction Footprint
- Property Boundaries
- ACT/NSW Border
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Watercourses
- Nature Reserves

Potentially Contaminated Sites

- Rural Block 1614 - Intrusive Investigations Required

Potential Contamination

- Historic Sheep Spray Dip
- Observed Fill (1975)
- Potential Fill Mound
- Sporadic Bricks

FIGURE 6.3B

Potential Sources of Contamination in the Proposal Area

Image Source: Nearmap (2022) Data source: ACT Government (2023)

Human receptors sensitive to contamination in the Proposal Area include current users of the site, primarily any agricultural workers, and people involved in construction and maintenance of the Proposal. Sensitive environmental receptors include surface water, groundwater, and terrestrial ecosystems.

Transport pathways between the potential sources of contamination and human receptors include ingestion, dermal contact and inhalation of dust and/or vapours. Transport pathways to the sensitive environmental receptors include surface water runoff; leaching of contaminants into and from groundwater; lateral groundwater movements; and inhalation, ingestion and absorption by fauna or flora.

6.4 Potential Impacts

Potential soil impacts of the Proposal, as identified in the risk assessment in **Section 4.2** and summarised in **Section 6.1**, include:

- Soil degradation caused by erosion and sedimentation from construction activities.
- Soil contamination from fuel or chemical leaks/spills or from disturbance of previously unidentified contamination.

These potential impacts are assessed in detail below.

6.4.1 Erosion and Sedimentation

Construction activities that involve vegetation clearance and soil disturbance could lead to increased erosion and sedimentation and ultimately soil degradation. This includes earthworks at new tower locations, existing towers, and potentially the access tracks, laydown areas and construction compounds.

The Proposal is not expected to have any impacts on soils once operational, as all disturbed areas will be rehabilitated (revegetated) post-construction. There would be a minimal increase in impermeable surface area across the landscape which could cause increased runoff and soil erosion (limited to the concrete foundations for the new towers).

Erosion and sedimentation impacts can be mitigated and managed using standard construction controls. These measures will be detailed in an ESCP which will accompany the CEMP, as described in **Section 6.5.1**.

6.4.2 Contamination

Potential contamination impacts arising from Proposal construction are associated with the disturbance of existing contaminated material (including material not previously identified), or leaks or spills from fuel or chemicals used during construction activities.

As discussed in **Section 6.3.2**, there are several sources of contamination that are known to occur in the Proposal Area (e.g. fill, Block 1586) or which have the potential to occur (e.g. PFAS, pesticides). Disturbance of this contaminated material during Proposal construction activities could spread the contamination across a wider area and lead to soil degradation, as well as water quality impacts and impacts on sensitive habitats. The known areas of contamination will be avoided by the Proposal where possible. Any contamination unable to be avoided will be managed in accordance with an Unexpected Finds Protocol, and existing controls for management of soils (for Block 1586 specifically). The control measures are detailed in **Section 6.5.2**.

Machinery required for Proposal construction activities, particularly civil works, would likely be diesel powered. Refuelling and minor maintenance and servicing of this machinery may take place within the Proposal Area. Spills or leaks of fuel or chemicals could release contaminants onto site and result in soil contamination if not properly managed. Contaminants associated with diesel fuel include TRH, BTEX, PAHs, and solvents. These risks will be managed through standard construction controls, as described in **Section 6.5**.

6.4.3 Import of Fill

During demolition works, soil removed during the excavation of concrete footings would be replaced into holes. If additional fill is required, virgin excavated natural material (VENM) would be imported into rural areas; and clean construction fill would be used within Ginninderry area. Material volumes and disposal locations would be further detailed in the Development Application.

6.5 Mitigation and Management Measures

Measures for mitigating and managing potential surface water and groundwater impacts of the Proposal will be formalised within an industry best practice CEMP. These controls will generally relate to the management of erosion, sedimentation and contamination, as described below. The mitigation and management measures will be consistent with all relevant ACT guidelines and policies, including:

- Water Quality EPP (EPA, 2008)
- Hazardous Materials EPP (EPA, 2022b)
- Requirements for the reuse and disposal of contaminated soil in the ACT (EPA e, n.d.)
- Guideline for Stockpile Management (EPA, 2019)
- Guidance for spoil management in the ACT (EPA f, n.d.)
- Guidance for discharge from sediment control ponds (EPA b, n.d.)
- Guidance for preventing pollution from concreting operations (EPA d, n.d.)
- Information sheets relating to prevention of pollution from building sites (Access Canberra, n.d.)
- Environment Protection Guidelines for Construction and Land Development in the ACT (EPA, 2011).

6.5.1 Erosion and Sediment Control

The CEMP will be accompanied by a detailed ESCP which will build upon the preliminary ESCP attached at **Appendix G3** and detail the erosion and sediment controls to be implemented during construction of each component of the Proposal.

The preliminary ESCP identifies standard erosion and sediment controls to be implemented for each type of construction activity, including new tower construction, demolition of existing towers, laydown area construction, and access track construction.

Each type of construction activity will have the following standard erosion and sediment controls:

- Sediment fence to be installed downslope of areas to be disturbed.

- Stabilised site access points to be installed as required to reduce the tracking of soil material off-site and to provide a stable surface for vehicle access to the construction site, involving the use of aggregate or recycled concrete along the access track surface and earth bunds to divert stormwater runoff to a sediment trap.
- Clean water diversions to be installed as an earth bank upslope of areas to be disturbed.
- Level spreaders to be installed at the end of the clean water diversions to dissipate concentrated flow paths where required.

Refer to **Figure 6.4** to **Figure 6.7** for example ESCPs for the four main types of construction activities.

The CEMP / ESCP will also document the controls to be implemented for stockpile and spoil management, including:

- Topsoil to be stripped while in a moist condition to maintain the soil structure.
- Topsoil to be kept separate from subsoil during stripping and stockpiling.
- Topsoil to be preserved on site for reuse in the stabilisation and rehabilitation activities, or for backfilling at demolition sites if possible.
- Topsoil to be stockpiled at heights no greater than 2 m to assist in maintaining seed viability, and to minimise compaction of stockpiles to maintain soil structure.
- Topsoil to be reapplied within 12 months of stripping where possible, during progressive site rehabilitation.
- Spoil to be placed in designated and clearly demarcated stockpile locations within the Proposal Area at locations identified in the CEMP / final ESCP. Stockpile locations to avoid high erosion areas, particularly areas of concentrated water flows such as roads, drainage lines and slopes steeper than 10%.
- Stockpiles to be protected from wind, rain, concentrated surface water flow and excessive stormwater flows. Sediment fencing to be installed on the downslope side of stockpiles and a clean water diversion bund to be installed on the upslope side (e.g. see **Plate 6.2**).
- Stockpiles to be placed outside of sensitive areas including drainage lines and important habitat and where possible, close to stabilised site access points.
- Stockpiles to be stabilised (vegetated) if in place for more than 14 days.

As part of site stabilisation and progressive rehabilitation, backfilling of holes created during construction or demolition will occur through preferentially using topsoil and subsoils sourced from construction or demolition activities as part of the Proposal. Where there may be insufficient fill generated from works on site for this purpose, VENM would be imported and used for this purpose.

If spoil is unable to be reused on site, it will be transported off site for reuse elsewhere (e.g. in the Ginninderry residential development) if possible, or for disposal. The CEMP will detail the requirements for transport and disposal of materials.

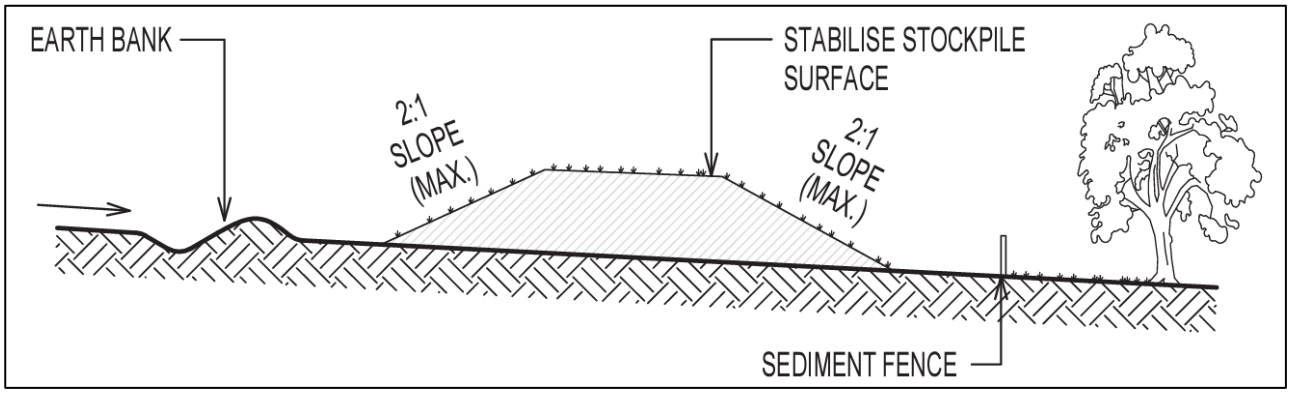
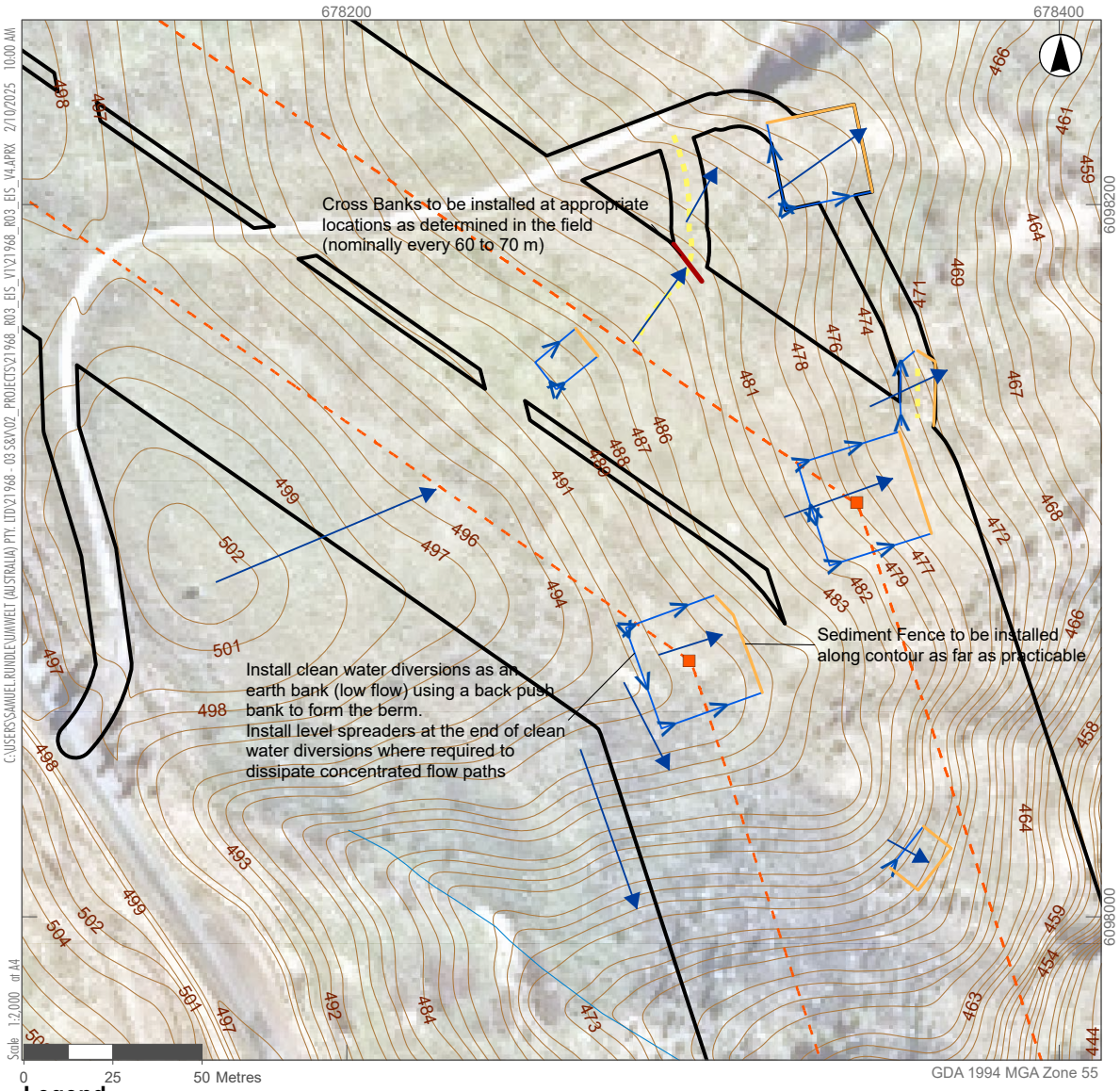


Plate 6.2 Example Stockpile Management Controls (Umwelt, 2023)



Legend

- Proposal Area
- Existing Transmission Towers to be Removed
- Existing Transmission Lines to be Removed
- New Alignments
- Proposed Transmission Towers
- Watercourse
- Contour 1m
- Clean Water Diversion
- Cross Bank
- Level Spreader
- Sediment Fence
- Slope
- Stabilised Site Access
- Temporary Waterway Crossing
- New Access Tracks
- New Access Tracks - Sedement control

ESCP NOTES

General Notes

1. This Erosion and Sediment Control Plan drawing should be read in conjunction with the Project Erosion and Sediment Control Plan document (Umwelt, 2023).
2. This plan is to be updated prior to construction following the finalisation of Proposal design and as required if the site conditions change or if installed controls are not operating effectively. The location of drainage, erosion and sediment controls is nominal only at this stage and subject to change.
3. Temporary controls in addition to those shown may be required as works progress and/or due to weather conditions.
4. All erosion and sediment controls to be constructed and maintained in accordance with the Erosion and Sediment Control Plan document (Umwelt, 2023) which includes design criteria and standard drawings from Chapter 5 of Environment Protection Guidelines for Construction and Land Development in the ACT (EPA, 2022) as well as Managing Urban Stormwater Volume 1 (Landcom, 2004) and Volume 2 (DECC, 2008) and Best Practice in Erosion and Sediment Control (IECA, 2008)
5. Personnel installing controls are to have demonstrated competence and experience.
6. All controls to be inspected regularly with maintenance and repairs as required.
7. Disturbed areas to be minimised as far as practicable to the areas essential for construction work only.
8. Disturbance is to be limited to nominated disturbance boundary. Undisturbed areas outside of the work zone to be regarded as exclusion zones, delineated with fencing or tape as required. All personnel to be instructed to avoid exclusion zones or damaging installed controls.
9. Slope breaks are to be used to limit slope lengths to a maximum of 80 m.
10. All disturbed areas to drain to an appropriate sediment control at all times.
11. No tracking of machinery through drainage lines is to occur.
12. No tracking of material onto roadways. Sediment to be removed from roadways as required.
13. All chemicals including fuels and oils to be stored adequately sized and sealed bunds
14. Concrete washout to occur into a plastic lined bund
15. Dust to be managed on site, particularly during dry, gusty weather conditions.
16. Site stabilisation is to be undertaken as soon as practicable following completion of construction activities.
17. Erosion and sediment controls are to be maintained in proper working condition and retained until the site has been adequately stabilised.

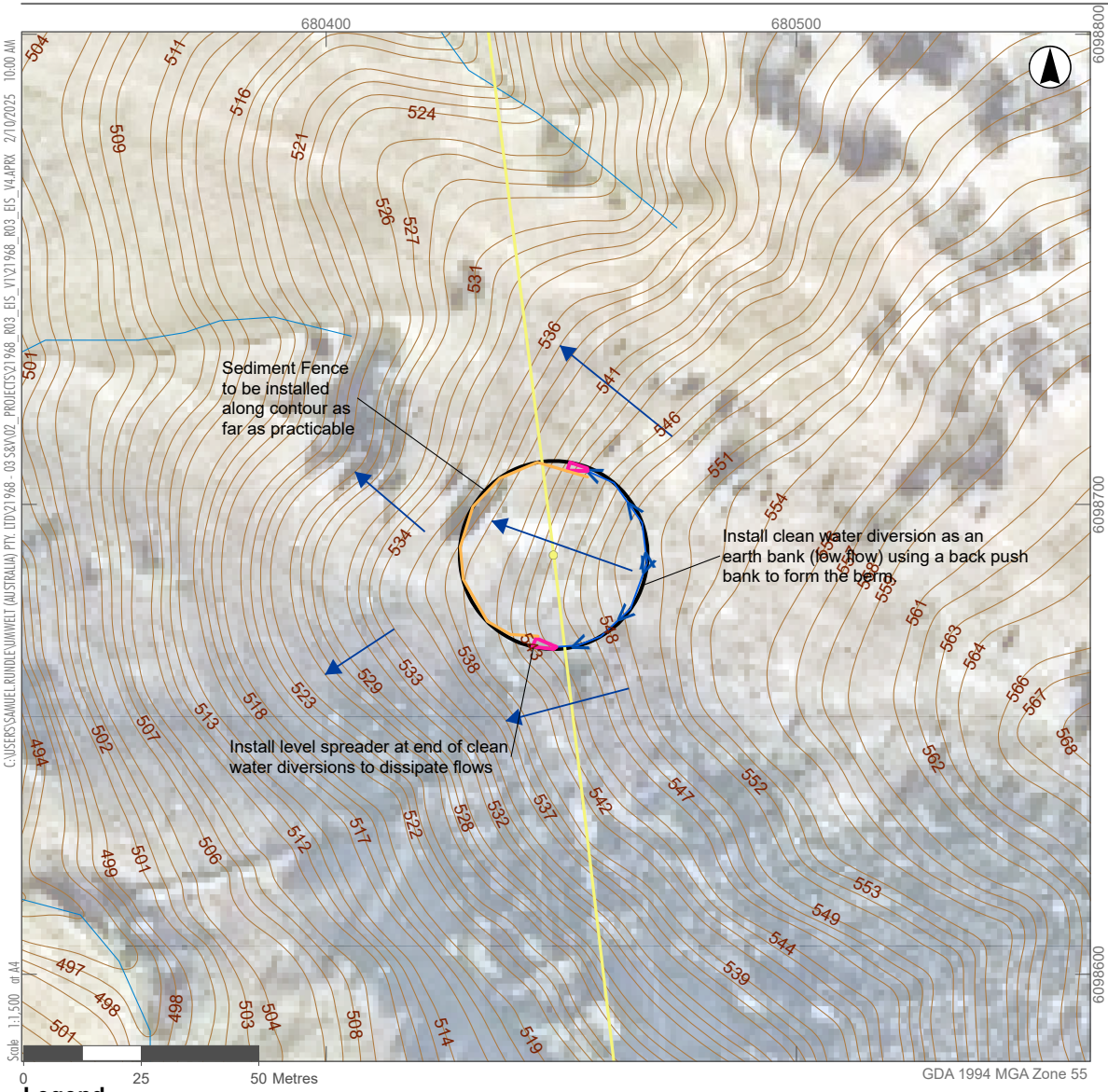
General Drainage, Erosion and Sediment Control Staging

1. Install sediment fence on downslope side of areas to be disturbed.
2. Install stabilised site access points as required
3. Install site access tracks including appropriate drainage controls as determined by on-site topography
4. Install clean water diversions along upper site boundaries and level spreader for clean water diversion discharge
5. Following completion of works stabilise remaining disturbed areas by sealing or revegetation in accordance with the Project design.
6. Following complete site stabilisation, i.e. 85% of the land within the site is stablised, remove all erosion and sediment controls and dispose of in an appropriate manner.

FIGURE 6.4

Example ESCP for Construction of a New Tower

Image Source: NearMap(2022) **Data source:** ACT Government (2022)



Legend

- Proposal Area
- Existing Transmission Towers to be Removed
- Existing Transmission Lines to be Removed
- New Alignments
- Proposed Transmission Towers
- Watercourse
- Contour 1m

ESCP

- Clean Water Diversion
- Cross Bank
- Level Spreader
- Sediment Fence
- Slope
- Stabilised Site Access
- Temporary Waterway Crossing

ESCP NOTES

General Notes

1. This Erosion and Sediment Control Plan drawing should be read in conjunction with the Project Erosion and Sediment Control Plan document (Umwelt, 2023).
2. This plan is to be updated prior to construction following the finalisation of Proposal design and as required if the site conditions change or if installed controls are not operating effectively. The location of drainage, erosion and sediment controls is nominal only at this stage and subject to change.
3. Temporary controls in addition to those shown may be required as works progress and/or due to weather conditions.
4. All erosion and sediment controls to be constructed and maintained in accordance with the Erosion and Sediment Control Plan document (Umwelt, 2023) which includes design criteria and standard drawings from Chapter 5 of Environment Protection Guidelines for Construction and Land Development in the ACT (EPA, 2022) as well as Managing Urban Stormwater Volume 1 (Landcom, 2004) and Volume 2 (DECC, 2008) and Best Practice in Erosion and Sediment Control (IECA, 2008)
5. Personnel installing controls are to have demonstrated competence and experience.
6. All controls to be inspected regularly with maintenance and repairs as required.
7. Disturbed areas to be minimised as far as practicable to the areas essential for construction work only.
8. Disturbance is to be limited to nominated disturbance boundary. Undisturbed areas outside of the work zone to be regarded as exclusion zones, delineated with fencing or tape as required. All personnel to be instructed to avoid exclusion zones or damaging installed controls.
9. Slope breaks are to be used to limit slope lengths to a maximum of 80 m.
10. All disturbed areas to drain to an appropriate sediment control at all times.
11. No tracking of machinery through drainage lines is to occur.
12. No tracking of material onto roadways. Sediment to be removed from roadways as required.
13. All chemicals including fuels and oils to be stored adequately sized and sealed bunds
14. Concrete washout to occur into a plastic lined bund
15. Dust to be managed on site, particularly during dry, gusty weather conditions.
16. Site stabilisation is to be undertaken as soon as practicable following completion of construction activities.
17. Erosion and sediment controls are to be maintained in proper working condition and retained until the site has been adequately stabilised.

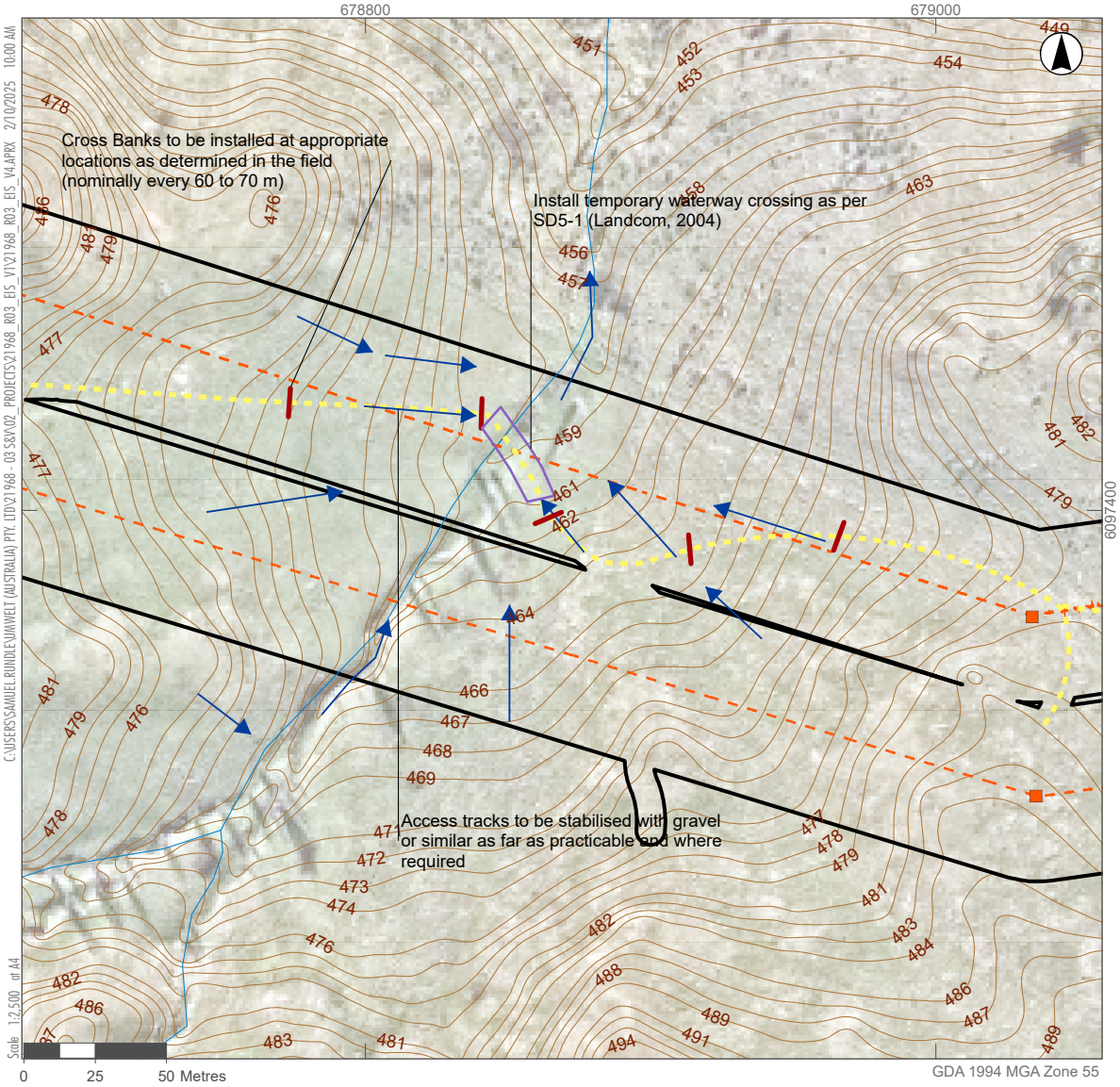
General Drainage, Erosion and Sediment Control Staging

1. Install sediment fence on downslope side of areas to be disturbed.
2. Install stabilised site access points as required
3. Install site access tracks including appropriate drainage controls as determined by on-site topography
4. Install clean water diversions along upper site boundaries and level spreader for clean water diversion discharge
5. Following completion of works stabilise remaining disturbed areas by sealing or revegetation in accordance with the Project design.
6. Following complete site stabilisation, i.e. 85% of the land within the site is stablised, remove all erosion and sediment controls and dispose of in an appropriate manner.

FIGURE 6.5

Example ESCP for Demolition of an Existing Tower

Image Source: NearMap(2022) **Data source:** ACT Government (2022)



Legend

- Proposal Area
- Existing Transmission Towers to be Removed
- Existing Transmission Lines to be Removed
- New Alignments
- New Access Tracks
- Proposed Transmission Towers
- Watercourse
- Contour 1m
- Clean Water Diversion
- Slope
- Cross Bank
- Level Spreader
- Sediment Fence
- Stabilised Site Access
- Temporary Waterway Crossing

ESCP NOTES

General Notes

1. This Erosion and Sediment Control Plan drawing should be read in conjunction with the Project Erosion and Sediment Control Plan document (Umwelt, 2023).
2. This plan is to be updated prior to construction following the finalisation of Proposal design and as required if the site conditions change or if installed controls are not operating effectively. The location of drainage, erosion and sediment controls is nominal only at this stage and subject to change.
3. Temporary controls in addition to those shown may be required as works progress and/or due to weather conditions.
4. All erosion and sediment controls to be constructed and maintained in accordance with the Erosion and Sediment Control Plan document (Umwelt, 2023) which includes design criteria and standard drawings from Chapter 5 of Environment Protection Guidelines for Construction and Land Development in the ACT (EPA, 2022) as well as Managing Urban Stormwater Volume 1 (Landcom, 2004) and Volume 2 (DECC, 2008) and Best Practice in Erosion and Sediment Control (IECA, 2008)
5. Personnel installing controls are to have demonstrated competence and experience.
6. All controls to be inspected regularly with maintenance and repairs as required.
7. Disturbed areas to be minimised as far as practicable to the areas essential for construction work only.
8. Disturbance is to be limited to nominated disturbance boundary. Undisturbed areas outside of the work zone to be regarded as exclusion zones, delineated with fencing or tape as required. All personnel to be instructed to avoid exclusion zones or damaging installed controls.
9. Slope breaks are to be used to limit slope lengths to a maximum of 80 m.
10. All disturbed areas to drain to an appropriate sediment control at all times.
11. No tracking of machinery through drainage lines is to occur.
12. No tracking of material onto roadways. Sediment to be removed from roadways as required.
13. All chemicals including fuels and oils to be stored adequately sized and sealed bunds
14. Concrete washout to occur into a plastic lined bund
15. Dust to be managed on site, particularly during dry, gusty weather conditions.
16. Site stabilisation is to be undertaken as soon as practicable following completion of construction activities.
17. Erosion and sediment controls are to be maintained in proper working condition and retained until the site has been adequately stabilised.

General Drainage, Erosion and Sediment Control Staging

1. Install sediment fence on downslope side of areas to be disturbed.
2. Install stabilised site access points as required
3. Install site access tracks including appropriate drainage controls as determined by on-site topography
4. Install clean water diversions along upper site boundaries and level spreader for clean water diversion discharge
5. Following completion of works stabilise remaining disturbed areas by sealing or revegetation in accordance with the Project design.
6. Following complete site stabilisation, i.e. 85% of the land within the site is stablised, remove all erosion and sediment controls and dispose of in an appropriate manner.

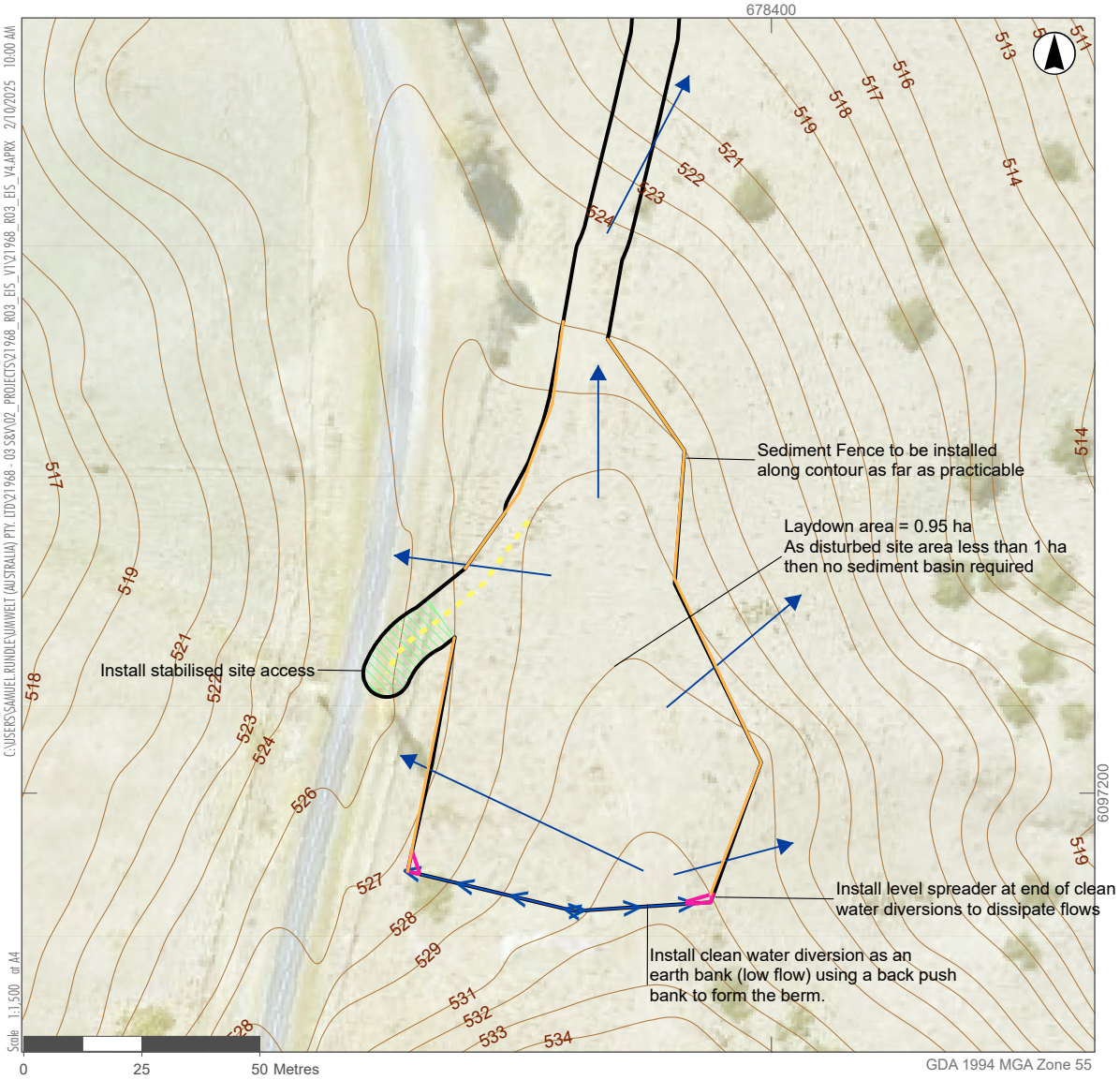
Installation of Temporary Waterway Crossings

1. Prohibit all traffic until the access way is constructed. Only undertake works within the waterway within a forecast 3-day dry weather window.
2. Strip any topsoil and stockpile within site laydown areas and with appropriate controls up and downslope.
3. Install temporary waterway crossing in accordance with Standard Drawing SD 5-1 from Landcom's Managing Urban Stormwater Volume 1 (2004). Following completion of works remove the temporary waterway crossing and stabilize disturbed areas in accordance with the Project Design and the Project Erosion and Sediment Control Plan document (Umwelt, 2023).

FIGURE 6.6

Example ESCP for Construction of an Access Track

Image Source: NearMap(2022) **Data source:** ACT Government (2022)



Legend

- Proposal Area
- Existing Transmission Towers to be Removed
- Existing Transmission Lines to be Removed
- New Alignments
- Proposed Transmission Towers
- Watercourse
- Contour 1m
- New Access Tracks
- New Access Tracks - Sedement control

ESCP

- Clean Water Diversion
- Slope
- Cross Bank
- Level Spreader
- Sediment Fence
- Temporary Waterway Crossing
- Stabilised Site Access

ESCP NOTES

General Notes

1. This Erosion and Sediment Control Plan drawing should be read in conjunction with the Project Erosion and Sediment Control Plan document (Umwelt, 2023).
2. This plan is to be updated prior to construction following the finalisation of Proposal design and as required if the site conditions change or if installed controls are not operating effectively. The location of drainage, erosion and sediment controls is nominal only at this stage and subject to change.
3. Temporary controls in addition to those shown may be required as works progress and/or due to weather conditions.
4. All erosion and sediment controls to be constructed and maintained in accordance with the Erosion and Sediment Control Plan document (Umwelt, 2023) which includes design criteria and standard drawings from Chapter 5 of Environment Protection Guidelines for Construction and Land Development in the ACT (EPA, 2022) as well as Managing Urban Stormwater Volume 1 (Landcom, 2004) and Volume 2 (DECC, 2008) and Best Practice in Erosion and Sediment Control (IECA, 2008)
5. Personnel installing controls are to have demonstrated competence and experience.
6. All controls to be inspected regularly with maintenance and repairs as required.
7. Disturbed areas to be minimised as far as practicable to the areas essential for construction work only.
8. Disturbance is to be limited to nominated disturbance boundary. Undisturbed areas outside of the work zone to be regarded as exclusion zones, delineated with fencing or tape as required. All personnel to be instructed to avoid exclusion zones or damaging installed controls.
9. Slope breaks are to be used to limit slope lengths to a maximum of 80 m.
10. All disturbed areas to drain to an appropriate sediment control at all times.
11. No tracking of machinery through drainage lines is to occur.
12. No tracking of material onto roadways. Sediment to be removed from roadways as required.
13. All chemicals including fuels and oils to be stored adequately sized and sealed bunds
14. Concrete washout to occur into a plastic lined bund
15. Dust to be managed on site, particularly during dry, gusty weather conditions.
16. Site stabilisation is to be undertaken as soon as practicable following completion of construction activities.
17. Erosion and sediment controls are to be maintained in proper working condition and retained until the site has been adequately stabilised.

General Drainage, Erosion and Sediment Control Staging

1. Install sediment fence on downslope side of areas to be disturbed.
2. Install stabilised site access points as required
3. Install site access tracks including appropriate drainage controls as determined by on-site topography
4. Install clean water diversions along upper site boundaries and level spreader for clean water diversion discharge
5. Following completion of works stabilise remaining disturbed areas by sealing or revegetation in accordance with the Project design.
6. Following complete site stabilisation, i.e. 85% of the land within the site is stablised, remove all erosion and sediment controls and dispose of in an appropriate manner.

FIGURE 6.7

Example ESCP for Construction of a Laydown Area

Image Source: NearMap(2022) **Data source:** ACT Government (2022)

The CEMP/ESCP will detail the monitoring and maintenance requirements for the erosion and sediment controls during Proposal construction. This will include:

- Visual inspections of all erosion and sediment controls each day during construction, prior to forecasted rainfall events with more than 10 mm in 24 hours, and after rainfall events with more than 10 mm in 24 hours.
- Visual inspections of drainage lines and waterbodies immediately downslope of disturbance areas, and of outflows from clean water diversions each week during construction, after rainfall events with more than 10 mm in 24 hours, and as required, to identify and fix any deficient erosion and sediment controls. Water quality will be inspected, including signs of turbidity and hydrocarbon slicks/spills.
- All inspections will be documented on the CEMP environmental inspection checklist and any actions will be closed out withing a reasonable and practical timeframe.

6.5.2 Contamination Management

The PSI (**Appendix G2**) concluded that the potential for gross chemical contamination within the Proposal Area is low. However, due to the potential fill and PFAS contamination identified near the LMWQCC, intrusive soil investigations will be undertaken as part of the DA process in Blocks 1614, 1602 and 1461 Belconnen, to confirm whether any contamination is present in the Proposal's disturbance area.
If contamination is confirmed, the CEMP will detail the measures to be implemented to manage the contamination during construction to prevent any further soil degradation or contamination of nearby waterbodies.

The CEMP will contain an Unexpected Finds Protocol in the event that contaminated soils or other materials are exposed during earthworks which are suspected of contamination (e.g. due to odour or discolouration). The following protocol will be implemented:

1. All earthworks will cease in the immediate vicinity of the material suspected of contamination.
2. Measures will be implemented to prevent run-on to the area with suspected contamination, and to contain runoff from the suspected contamination (e.g., construction of an earth bund around the area).
3. The material suspected of contamination and any rainfall runoff captured within the contained area will be classified in accordance with Environmental Standards: Assessment and Classification of Liquid and Non-Liquid Wastes (EPSDD, 2021b).
4. If the material (and any captured rainfall runoff) are confirmed as contaminated, earthworks in the vicinity of the contamination (nominally within a 100 m radius) will cease and a contaminated lands specialist will be engaged to develop a plan to:
    a. Manage and dispose of the contaminated material.
    b. Assess the risk of encountering additional areas of contamination.
    c. Identify any requirement for additional soil sampling to detect any additional areas of contamination.
5. If the classification process indicates soils are not contaminated, earthworks may proceed.

Additionally, the CEMP will document procedures for the transport, storage and management of fuels and any chemicals to be used during Proposal construction, including measures to manage accidental chemical spills or leaks (e.g. through the supply and maintenance of spill kits). It will also include a procedure for remediation if any contamination occurs as a result of the Proposal.

6.6 Residual Risk Assessment

The residual risk assessment in **Table 6.3** provides revised risk ratings with consideration of the mitigation and management measures discussed in **Section 6.5**. Residual risk ratings range from negligible to low, with all risks able to be reduced to ALARP. No significant residual risks are predicted to occur.

Table 6.3 Residual Assessment of Risks Associated with Soil and Contamination

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Construction								
S1	Construction activities such as vegetation clearance, civil works and tower demolition increase erosion and sedimentation, leading to soil degradation.	High	No	• Industry best practice CEMP will be implemented that includes a detailed ESCP (which builds upon the preliminary ESCP in **Appendix G3**) that documents the controls to be implemented to minimise and manage erosion and sedimentation and to contain sediment-laden runoff. All areas of disturbance will have the following standard erosion and sediment controls: o Sediment fence to be installed downslope of areas to be disturbed. o Stabilised site access points to be installed as required to reduce the tracking of soil material off-site and to provide a stable surface for vehicle access to the construction site, involving the use of aggregate or recycled concrete along the access track surface and earth bunds to divert stormwater runoff to a sediment trap. o Clean water diversions to be installed as an earth bank upslope of areas to be disturbed. o Level spreaders to be installed at the end of the clean water diversions to dissipate concentrated flow paths where required. • The CEMP/ESCP will document the controls to be implemented for stockpile and spoil management, including:	Possible	Minor	Low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				o Topsoil to be stripped while in a moist condition to maintain the soil structure. o Topsoil to be kept separate from subsoil during stripping and stockpiling. o Topsoil to be preserved on site for reuse in the stabilisation and rehabilitation activities, or for backfilling at demolition sites if possible. o Topsoil to be stockpiled at heights no greater than 2 m to assist in maintaining seed viability, and to minimise compaction of stockpiles to maintain soil structure. o Topsoil to be reapplied within 12 months of stripping where possible, during progressive site rehabilitation. o Spoil to be placed in designated and clearly demarcated stockpile locations within the Proposal Area at locations identified in the CEMP / ESCP. Stockpile locations to avoid high erosion areas, particularly areas of concentrated water flows such as roads, drainage lines and slopes steeper than 10%. o Stockpiles to be protected from wind, rain, concentrated surface water flow and excessive stormwater flows. Sediment fencing to be installed on the downslope side of stockpiles and a clean water diversion bund to be installed on the upslope side.				

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				o Stockpiles to be placed outside of sensitive areas including drainage lines and important habitat and where possible, close to stabilised site access points. o Stockpiles to be stabilised (vegetated) if in place for more than 14 days. • As part of site stabilisation and progressive rehabilitation, backfilling of holes created during construction or demolition will occur through preferentially using topsoil and subsoils sourced from construction or demolition activities as part of the Proposal. Where there may be insufficient fill generated from works on site for this purpose, VENM would be imported and used for this purpose. • If spoil is unable to be reused on site, it will be transported off site for reuse at other construction sites if possible, or for disposal. The CEMP will detail the requirements for transport and disposal of materials. • The CEMP will also include general best practice measures for minimising managing movement of soil throughout the Proposal Area and surrounds, including: o Onsite demarcation of approved disturbance areas to ensure that construction activities, facilities, infrastructure and materials are constrained to these areas to avoid unapproved impacts on adjacent areas. Disturbance areas will be set back from				

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				drainage lines, waterbodies and sensitive habitats. o Construction vehicles to only use approved disturbance areas, including demarcated access tracks. o Disturbance areas to be stabilised and rehabilitated as soon as practicable. • The CEMP/ESCP will detail the monitoring and maintenance requirements for the erosion and sediment controls during Proposal construction. This will include: o Visual inspections of all erosion and sediment controls each day during construction, prior to forecasted rainfall events greater than 10 mm in 24 hours, and after rainfall events with more than 10 mm in 24 hours. o Visual inspections of drainage lines and waterbodies immediately downslope of disturbance areas, and of outflows from clean water diversions each week during construction, after rainfall events with more than 10 mm in 24 hours, and as required, to identify and fix any deficient erosion and sediment controls. Water quality will be inspected, including signs of turbidity and hydrocarbon slicks/spills. • All inspections to be documented on the CEMP environmental inspection checklist and any actions to be closed out withing a reasonable and practical timeframe.				

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
S2	Fuel or chemical spills, or disturbance of existing contaminated material, lead to soil contamination which could result in environmental degradation and fines under the EP Act.	Low	No	• Intrusive soil investigations will be undertaken as part of the DA process in Blocks 1614, 1602 and 1461 Belconnen to confirm whether any contamination is present in the Proposal Area. Any contaminated material identified during the intrusive investigations will be avoided if possible through Proposal re-design, or managed in accordance with controls specified in the CEMP. • The CEMP will contain an Unexpected Finds Protocol in the event that contaminated soils or other materials are exposed during the intrusive investigations or Proposal construction activities which are confirmed or suspected of contamination. The following protocol will be implemented: o All earthworks will cease in the immediate vicinity of the contaminated material (or the material suspected of contamination). o Measures will be implemented to prevent run-on to the contaminated area and to contain runoff from the contaminated material (e.g. construction of an earth bund around the area). o The contaminated material and any rainfall runoff captured within the contained area will be classified in accordance with Environmental Standards: Assessment and Classification of Liquid and Non-Liquid Wastes (EPSDD, 2021a).	Remote	Minor	Negligible	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				o If the material (and any captured rainfall runoff) are confirmed as contaminated, earthworks in the vicinity of the contamination (nominally within a 100 m radius) will cease and a contaminated lands specialist will be engaged to develop a plan to: ▪ Manage and dispose of the contaminated material. ▪ Assess the risk of encountering additional areas of contamination. ▪ Identify any requirement for additional soil sampling to detect any additional areas of contamination. ▪ If the classification process indicates soils are not contaminated, earthworks may proceed. • The CEMP will also document procedures for the transport, storage and management of fuels and any chemicals to be used during Proposal construction, including measures to manage accidental chemical spills or leaks (e.g. through the supply and maintenance of spill kits). It will include a procedure for remediation if any contamination occurs as a result of the Proposal.				

7.0 Surface Water and Groundwater

Chapter Summary
This chapter provides an assessment of potential impacts on water quality and hydrology within and surrounding the Proposal Area. This includes an assessment of both surface water and groundwater matters.

7.1 Preliminary Risk Assessment

An assessment of Proposal risks associated with water quality and hydrology is provided in **Table 7.1**. The risk ratings range from very low to high, with significant impacts possible from increased erosion and sedimentation of nearby waterways if not appropriately mitigated and managed.

Section 7.2 to **Section 7.4** provide a detailed assessment of these risks. The residual risk assessment in **Section 7.6** provides revised ratings for each risk based on the mitigation and management measures described in **Section 7.5**.

Table 7.1 Preliminary Assessment of Risks Associated with Water Quality and Hydrology

ID	Risk Scenario	Preliminary Risk Assessment			
		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Construction					
W1	Earthwork activities generate soil that increases sedimentation of nearby waterways when transported off site.	Possible	Major	High	No
W2	Fuel or chemical spills, or disturbance of existing contaminated material, lead to contamination of groundwater and/or nearby waterways, which could result in environmental degradation and fines under the EP Act.	Unlikely	Moderate	Low	No
W3	Any groundwater dewatering required is discharged directly or indirectly to surface waterbodies, impacting the water quality of the receiving waters.	Unlikely	Moderate	Low	No
W4	Any groundwater dewatering required results in localised changes to groundwater levels.	Unlikely	Minor	Very low	No
W5	Water generated during fire suppressing activities resulting from construction activities, results in run-off, and potential environmental degradation.	Possible	Moderate	Medium	No

7.2 Investigations

A desktop assessment was undertaken to identify existing surface water and groundwater conditions in the Proposal Area and surrounds. This included reviews of a range of data sources as described in **Table 7.2**.

The desktop assessment was informed by the PSI (Douglas Partners, 2024) which investigated potential sources of contamination that may exist in the Proposal Area and which, if disturbed during construction, could lead to contamination of nearby water sources. The PSI involved a review of desktop information including soil and geological mapping, the ACT Groundwater Abstraction Bore Register, the EPA's Contaminated Land Register and historical aerial photography, followed by a site walkover. The PSI is attached at **Appendix G2.**

The desktop assessment was also supplemented by the preliminary ESCP in **Appendix G3**, which was prepared by Umwelt (2023). The ESCP details relevant drainage, erosion and sediment controls that are anticipated to be implemented during construction of the Proposal to manage erosion and sedimentation risks. As the detailed design, construction methodology and works staging have not yet been finalised for the Proposal, the ESCP is only a preliminary plan and will be further developed for the DA.

Table 7.2 Data Sources Used for the Desktop Water Assessment

Data Source	Description
Water NSW website	Provides real-time data on surface water and groundwater. Used to obtain surface water data.
ACT Government Abstraction Bores and Monitoring Bores databases	Provide groundwater data. Used to search for bores and groundwater data near the Proposal Area.
BoM Australian Groundwater Explorer and National Groundwater Information System (NGIS) database	Provides groundwater data. Used to search for bores and groundwater data near the Proposal Area.
ACT Waterwatch Catchment Health Indicator Program (CHIP) reports	A CHIP report provides a health score for a specific river or wetland using data collected by Waterwatch volunteers.
Australian Soil Resource Information System (ASRIS)	Provides soil and land use data. Used to obtain regolith mapping from the Commonwealth Scientific and Industrial Research Organisation (CSIRO).
NSW Department of Planning, Industry and Environment eSPADE website	Provides soil information for NSW and the ACT. Used to obtain hydrogeological landscape mapping.
EPBC Act Protected Matters Search Tool	Identifies MNES that may be present within a search area (refer to **Section 3.1.2.2** for more information on the EPBC Act). Used to identify wetlands and protected areas near the Proposal Area.
Icon Water website	Used to obtain publicly available reports and details on the LMWQCC.

7.3 Existing Conditions and Values

7.3.1 Surface Water

The Proposal traverses two riparian corridors, the Murrumbidgee and Molonglo Rivers, as well as several smaller water features such as creeks and farm dams (see **Figure 7.1**). The eastern sections of the new alignments are within the lower Molonglo catchment, while the western sections of the new alignments and the lines to be removed are located within the upper Murrumbidgee catchment.

No Ramsar wetlands or nationally important wetlands are within the Proposal Area or in proximal distance downstream (where a hydrological connection could lead to impacts from the Proposal).

Water quality monitoring of the Molonglo River near the Murrumbidgee River confluence is undertaken as part of the Upper Murrumbidgee Waterwatch program. The CHIP, which provides annual reporting on catchment health, found the Molonglo River to be in 'fair' condition in 2022, just upstream of its confluence with the Murrumbidgee River (O'Reilly, et al., 2022). Water quality results indicate the pH and turbidity were found to be 'excellent', phosphorus, dissolved oxygen and electrical conductivity in 'good' condition, nitrate to be in 'fair' condition and riparian condition to be 'poor' (O'Reilly, et al., 2022). The report noted that this part of the Molonglo River is strongly impacted by outflows from the LMWQCC, with nitrate levels much higher than upstream and at most other sites in the catchment. The LMWQCC has effluent discharge targets to ensure the water is treated to a standard suitable to not cause environmental harm, for parameters such as phosphorus, nitrogen, suspended solids and chlorine (Icon Water, 2024).

The Upper Murrumbidgee CHIP report (O'Reilly, et al., 2022) does not provide any information on the section of the Murrumbidgee River in the Proposal Area.

Refer to **Section 6.3.1** for a detailed description of the soil, geology and contamination conditions across the Proposal Area and surrounds.

7.3.2 Groundwater

The Proposal sits within the Uriarra Road HGL. Groundwater occurrence within the Uriarra HGL is largely associated with the regolith (soil and weathered bedrock) and within the Walker Volcanics (fractured rock) (DPIE, 2017). Groundwater in the regolith generally occurs within 2 and 8 m of the surface in the Uriarra HGL. The regolith can have a hydraulic conductivity of 0.1–10 m/day and lateral flow through unconsolidated sediments can occur on slopes in drainage lines in this landscape (DPIE, 2017).

The publicly available ACT and Commonwealth groundwater bore datasets show that there is only one registered groundwater bore located within 1 km of the Proposal Area. This bore is at the Burns Golf Club in Holt, adjacent to Line 3C (see **Figure 7.1**), but contains no useful data such as groundwater levels.

The PSI did not involve any intrusive field investigations which could provide information about groundwater in the Proposal Area. However, a PSI was undertaken by Douglas Partners (2022) for the Territory Battery project on Block 1634 Belconnen, and by WSP (2018b) for the Stockdill Substation on Block 1635 Belconnen, both of which are relevant to the eastern end of the new alignments.
No groundwater was intercepted during the excavation of twenty test pits with a maximum depth of 1.1 metres below ground (mbgl) for the Territory Battery PSI, but groundwater was encountered at depths ranging between 5.1 and 10 mbgl at the Stockdill Substation site (Umwelt, 2024).

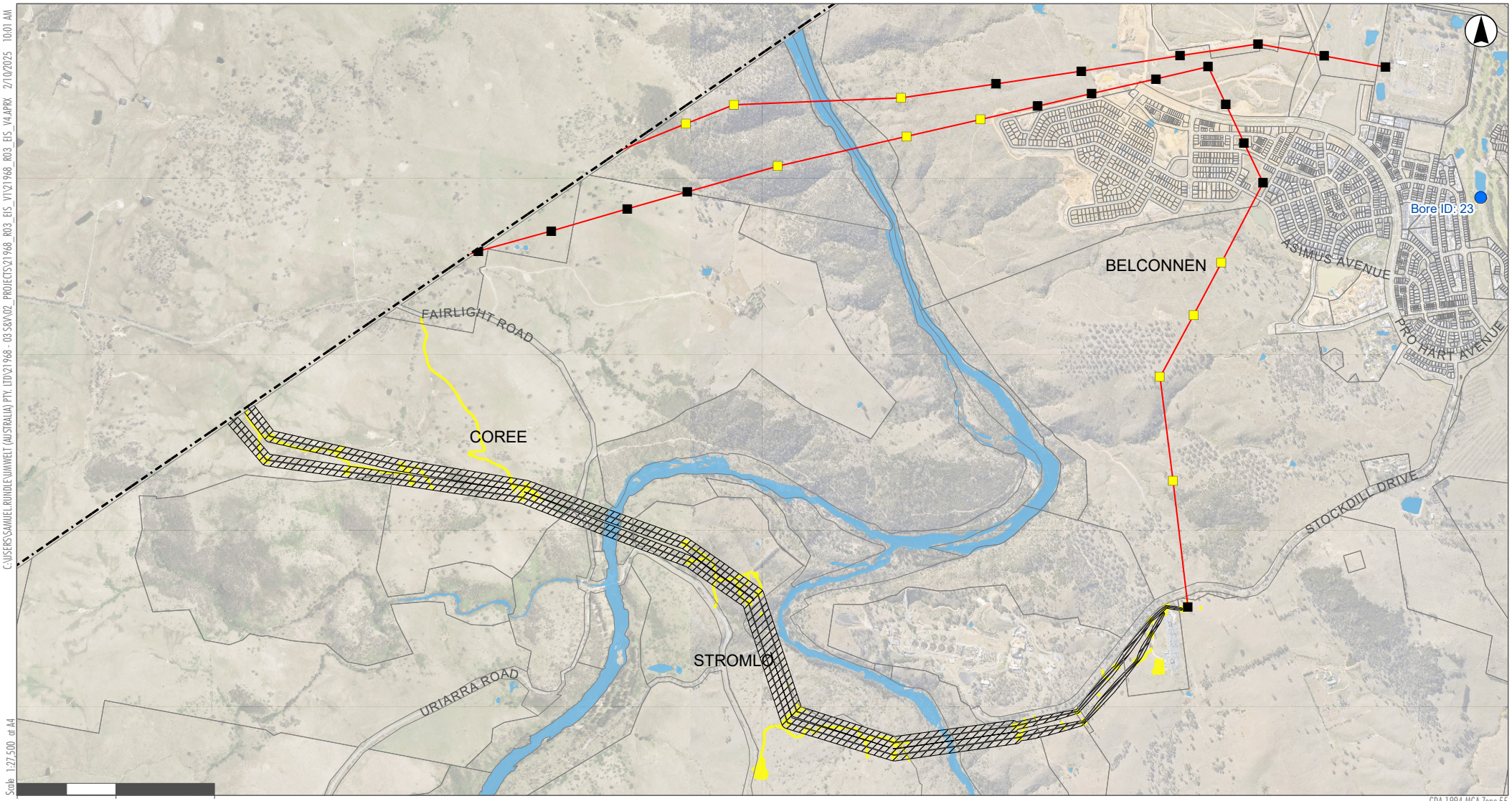


FIGURE 7.1

Surface Waterbodies and Bores Near the Proposal Area

Image Source: Nearmap (2022) Data source: ACT Government (2021)

Furthermore, the Groundwater Impact Assessment undertaken for the Territory Battery EIS (Umwelt, 2022) determined that groundwater in the area is likely to be associated with secondary porosity (caused by processes occurring after the rock has been deposited), within weathered rock and sediment, fractures, and faults. Groundwater recharge is likely to occur from rainfall and potentially from seepage from surface water flows, and may discharge to the Molonglo and Murrumbidgee Rivers.

Groundwater quality data is not available for the Proposal Area, however, water quality data from the closest known bore (5 km east of the Proposal Area) indicates a neutral pH (7.1) and slightly brackish water (electrical conductivity of 1,800 µS/cm). This bore is located within the same mapped geology as the Proposal Area (the Walker Volcanics). Refer to **Section 6.3.1** for more information on geology in the area.

7.4 Potential Impacts

Potential water quality and hydrology impacts of the Proposal, as identified in the risk assessment in **Section 4.2** and summarised in **Section 7.1**, include:

- Alteration of surface water quality by erosion and sedimentation from construction activities including vegetation clearance, and installation and removal of infrastructure, access roads and compounds.
- Contamination of nearby waterways and possibly groundwater as a result of fuel or chemical leaks/spills or disturbance of previously unidentified contamination.
- Localised changes to groundwater levels as a result of any groundwater dewatering required for tower foundation installation.
- Changes to surface water quality caused by inappropriate disposal of any dewatered groundwater.

These potential impacts are assessed in detail below.

7.4.1 Surface Water

As discussed in **Section 6.4.1**, construction activities that involve vegetation clearance and soil disturbance could lead to increased erosion and sedimentation and surface water impacts. This includes earthworks at new tower locations, existing towers, and potentially the access tracks, laydown areas and construction compounds. In addition, earthworks may generate spoil that could lead to increased sedimentation if not disposed of or managed appropriately.

Uncontrolled discharges of stormwater, or discharges of water from fire suppressing activities from Proposal construction, including construction of the new alignments and demolition of the existing lines, could have adverse surface water quality impacts from erosion and sedimentation. The Molonglo and Murrumbidgee Rivers would both be susceptible to impacts if there are insufficient on-site controls.

Groundwater dewatering would be required at the new tower locations if it is intercepted during excavation for the foundations. If the extracted groundwater is not appropriately managed and is discharged to surface waterbodies (directly or indirectly), the water quality of the receiving waterbodies could be impacted. This is discussed further in **Section 7.4.3**.

Construction of the Proposal would involve on-site vehicle and plant movement and potential refuelling, which could have adverse surface water quality impacts if spills or leakages were to occur and not be managed on-site. Civil works including the excavation of soil and generation of spoil could also impact on surface water quality if any uncontained chemicals or soils are transported by stormwater runoff into nearby waterways.

The use of water for dust suppression could also impact nearby waterways, depending on the source of water used. If the water used is of a lower quality than that of nearby waterways, this could cause an impact on surface water quality. It could also increase the mobilisation and flushing of salts stored in the soil, which could be transported to downstream waterways. The degree of impact would depend on the amount of recharge and salt content in the soil in the Proposal Area.

The Proposal is not expected to have any impacts on surface water once operational, as all disturbed areas will be rehabilitated (revegetated) post-construction. There would be a minimal increase in impermeable surface area across the landscape which could cause increased runoff (limited to the concrete foundations for the new towers).

All of the above potential impacts can be mitigated and managed using standard construction controls for erosion, sedimentation, contamination, dust and groundwater management and would be addressed in a Construction Environmental Management Plan (CEMP) required as a condition of approval before construction. These measures are described in **Section 7.5**.

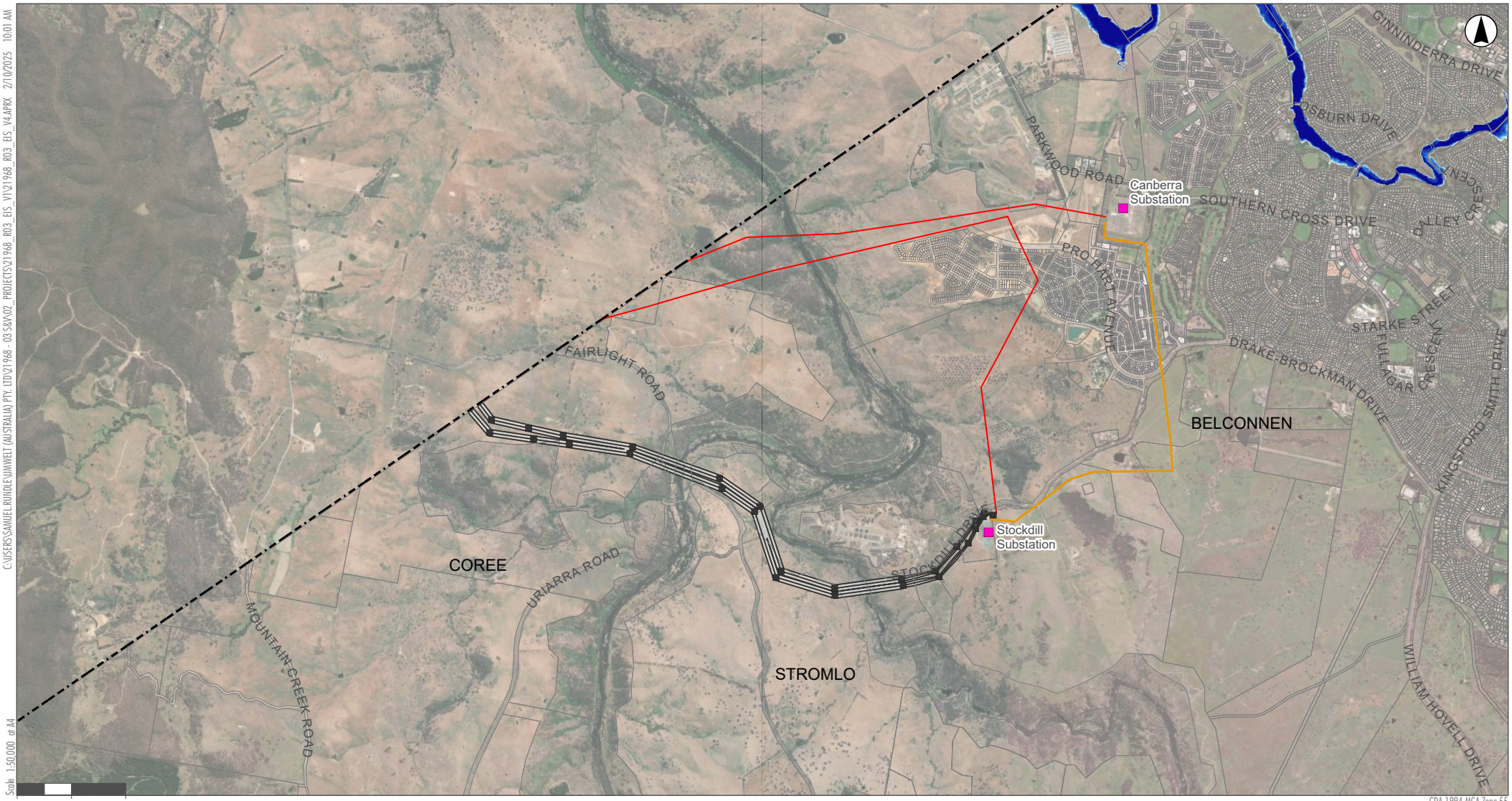
7.4.2 Flooding

ACTmapi flood mapping indicates that no infrastructure proposed to be installed as part of the Proposal is located in an area that may be flooded in a major river flood event (a major flood is defined as one that has a 1% chance of happening in any given year) (EPSDD, 2024). A 1% annual exceedance probability (AEP) flood event would extend along the Molonglo River from Scrivener Dam (which forms Lake Burley Griffin) to a location downstream of Whitlam, more than 5 km upstream from the Proposal Area (see **Figure 7.2**). The flood risk posed by a rainfall event to the Proposal infrastructure is therefore considered to be minimal, particularly as the existing Line 1 and Line 7 infrastructure has not historically been impacted by any flood events.

However, Uriarra Crossing on the Murrumbidgee River is known to flood. While no infrastructure is located adjacent to Uriarra Crossing where it could be damaged by floodwater, transport vehicles would use Uriarra Crossing during construction. Any closures to Uriarra Crossing during floods could therefore impact construction routes and timeframes, with construction vehicles needing to travel via alternate routes to areas west of the Murrumbidgee River. Refer to **Chapter 11.0** for more information about the Proposal's traffic and transport considerations.

Flood mapping was provided by Icon Water for dam failure scenarios of Googong Dam (which would cause flooding along the Molonglo River, and Murrumbidgee River downstream of the confluence) and the Cotter River dams (Cotter, Bendora and Corin Dams, which would cause flooding along the Murrumbidgee River). As shown in **Figure 7.3** and **Figure 7.4**, none of the new towers are located within the probable maximum flood extent caused by a dam failure in either scenario, thus the Proposal is not considered to be at risk of damage from a flood caused by failure of either the Googong or Cotter River dams.

Neither construction nor operation of the Proposal would change the existing flood risk in the landscape.



Legend

- New Alignments
- Transmission Lines to be Removed
- Line 3C Alignment – subject to separate approvals
- Existing Substation
- Property Boundaries
- ACT/NSW Border

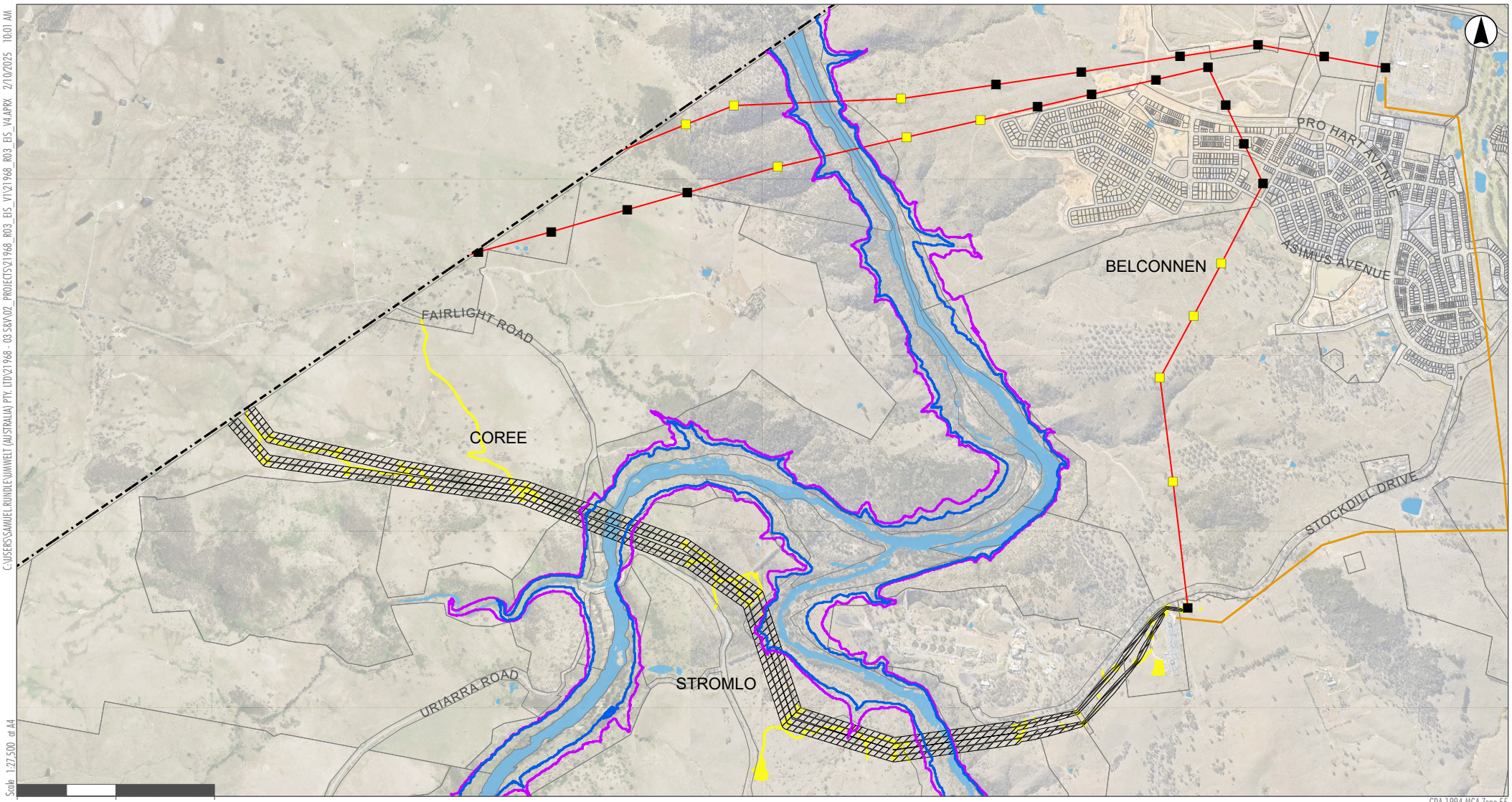
1 in 100 Year Depth Model (1% AEP)

- 0.01 - 0.25
- 0.25 - 0.5
- 0.5 - 0.75
- 0.75 -1
- 1 - 1.5
- > 1.5

FIGURE 7.2

1 in 100 Year Flood Model Extent (ACTmapi)

Image Source: Nearmap (2022) Data source: ACT Government (2023)



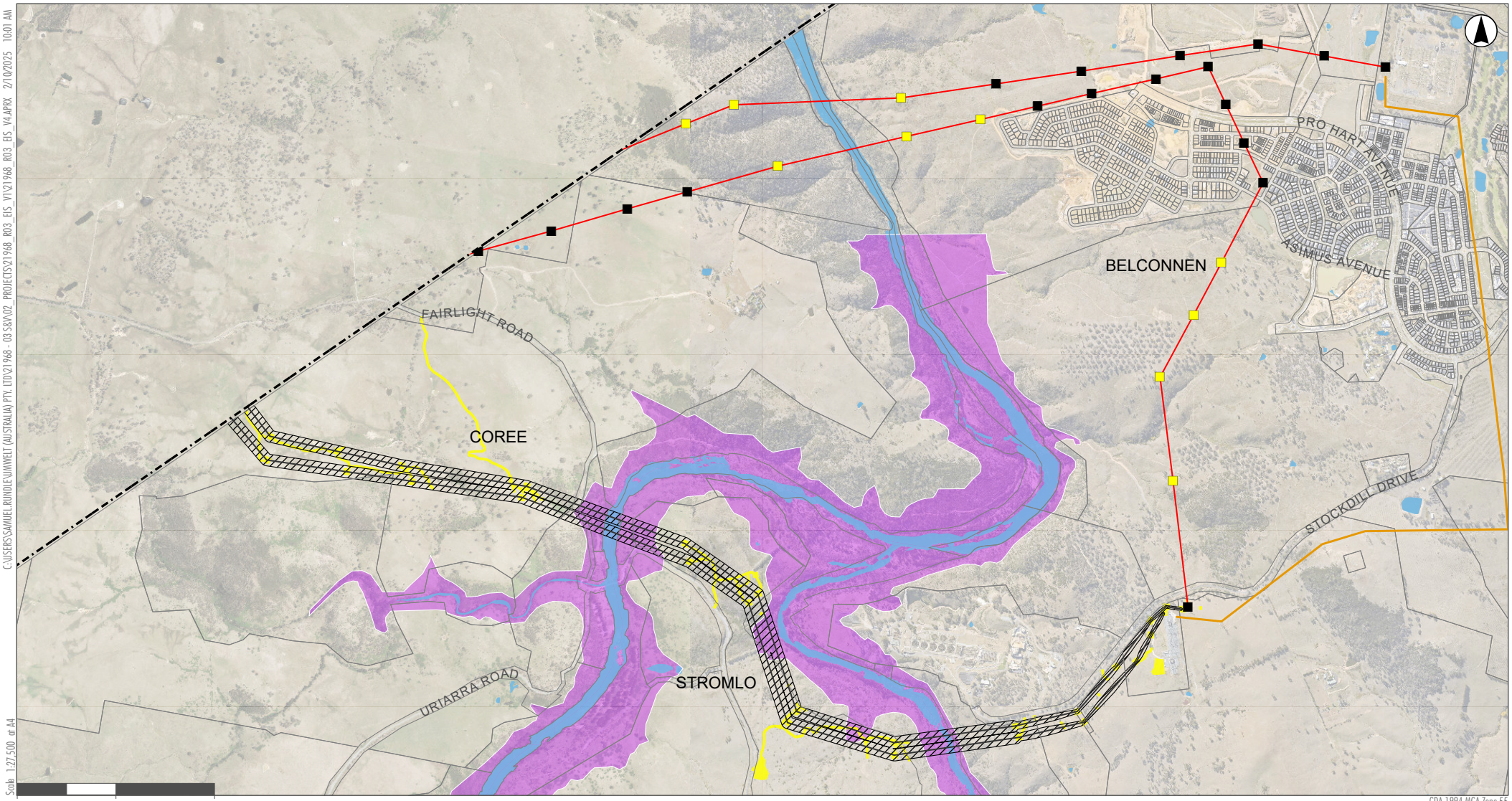
Legend

- Demolition Sites
- Tower Foundations to be Left In Situ
- Construction Footprint
- Operational Footprint
- New Transmission Lines
- Transmission Lines to be Removed
- Line 3C Alignment – subject to separate approvals
- Property Boundaries
- ACT/NSW Border
- Watercourses
- Probable Maximum Flood - main embankment piping breach
- Probable Maximum Flood - no breach

FIGURE 7.3

Probable Maximum Flood Extent for a Failure of Googong Dam

Image Source: Nearmap (2022) Data source: ACT Government (2021), ICON Water (2024)



C:\USERS\SAMUEL.RUNDLE\UMWELT (AUSTRALIA) PTY. LTD\21968 - 03 S&R\02_PROJECTS\21968_R03_EIS_V1\21968_R03_EIS_V4.APRX 2/10/2025 10:01 AM

Scale: 1:27,500 at A4

FIGURE 7.4

Probable Maximum Flood Extent for a Failure of Cotter River Dams

Image Source: Nearmap (2022) Data source: ACT Government (2021), ICON Water (2024)

7.4.3 Groundwater

The groundwater system underlying the Proposal Area is likely to be recharged from rainfall and potentially from seepage from surface water flows. Changes to surface water quality caused by Proposal construction activities, as discussed in **Section 7.4.1**, therefore have the potential to impact on groundwater quality.

The Proposal is not expected to require groundwater extraction from the Proposal Area. However, if groundwater is intercepted at the new tower locations (where the tower foundations would be up to 10 m deep), it would need to be dewatered to allow the foundations to be installed. Groundwater dewatering creates a temporary, localised, "cone of depression" (i.e. area of reduced groundwater levels) which radiates outwards from the edge of the excavation. This has the potential to impact groundwater levels, depending on the amount of groundwater ingress and associated dewatering and the dewatering duration.

Geotechnical investigations will be undertaken at each new tower location once detailed design is complete, which will confirm whether groundwater is likely to be intersected during excavation and require dewatering. A Dewatering Plan will be prepared as part of the CEMP if dewatering is required, to ensure extracted water is disposed of appropriately to avoid impacting surface water quality and sensitive habitats (see **Section 7.5.3** for further information).

Any spills or leakages of chemicals or fuels that occur during Proposal construction could impact groundwater quality if the chemicals are transported through the soil into the underlying groundwater. The use of water for dust suppression could also impact groundwater quality if it is of a different quality to the underlying groundwater or if it mobilises salts in the soil.

The Proposal is not expected to have any impacts on groundwater once operational.

As with the potential surface water impacts discussed in **Section 7.4.1**, the groundwater impacts can be mitigated and managed using standard construction controls. These measures are described in **Section 7.5**.

7.5 Mitigation and Management Measures

Measures for mitigating and managing potential surface water and groundwater impacts of the Proposal will be formalised within an industry best practice CEMP. These controls will generally relate to the management of erosion and sedimentation, contamination and groundwater, as described below.

The mitigation and management measures will be consistent with all relevant ACT guidelines and policies, as detailed in **Section 6.5**.

7.5.1 Erosion and Sediment Control

The CEMP will be accompanied by a detailed ESCP which will build upon the preliminary ESCP attached at **Appendix G3** and detail the erosion and sediment controls to be implemented during construction of each component of the Proposal.

The preliminary ESCP identifies standard erosion and sediment controls to be implemented for each type of construction activity, including new tower construction, demolition of existing tower, laydown area construction, and access track construction. Refer to **Section 6.5.1** for a detailed description of these controls, and to **Figure 6.4** to **Figure 6.7** for example ESCPs for the main types of construction activities.

In addition to the erosion and sediment controls described in **Section 6.5.1**, temporary waterway crossings will be installed for access tracks where required to avoid vehicles crossing steep or swampy watercourses. This would involve the use of aggregate to provide a stable surface and water diverting structures such as swales to divert runoff away from the crossing. Additionally, any single disturbance area that is larger than 1 ha will require a sediment basin as per Chapter 5 of the Environment Protection Guidelines for Construction and Land Development in the ACT (EPA, 2022a). This is not currently anticipated for the Proposal, but could occur if the Proposal requires any of the laydown areas to be expanded, for example. The detailed ESCP in the DA will provide design details for any sediment basins to be installed.

The CEMP / ESCP will also document the controls to be implemented for stockpile and spoil management, transport and disposal, and the monitoring and maintenance requirements for the erosion and sediment controls. Refer to **Section 6.5.1** for further information.

7.5.2 Contamination Management

The PSI (**Appendix G2**) concluded that the potential for gross chemical contamination within the Proposal Area is low. However, due to the potential fill and PFAS contamination identified near the LMWQCC (see **Figure 6.3**), intrusive soil investigations will be undertaken as part of the DA process in Blocks 1614, 1602 and 1461 Belconnen, to confirm whether any contamination is present in the Proposal's disturbance area. If contamination is confirmed, the CEMP will detail the measures to be implemented to manage the contamination during construction to prevent any nearby waterbodies from becoming contaminated.

The CEMP will contain an Unexpected Finds Protocol in the event that contaminated soils or other materials are exposed during earthworks which are suspected of contamination (e.g. due to odour or discolouration). Refer to **Section 6.5.2** for an outline of the protocol to be implemented:

The CEMP will also document procedures for the transport, storage and management of fuels and any chemicals to be used during Proposal construction, including measures to manage accidental chemical spills or leaks. It will also include a procedure for remediation if the Proposal results in any contamination.

Dust management measures will be detailed in the CEMP to ensure that no adverse impacts on surface water quality occurs from dust suppression activities. Refer to **Section 12.5.1** for further information.

7.5.3 Groundwater Management

The Proposal is not expected to require groundwater extraction from the Proposal Area. However, if groundwater is intercepted at the new tower locations (where the tower foundations would be up to 10 m deep), it would need to be dewatered to allow the foundations to be installed.

Geotechnical investigations will be undertaken at each new tower location once detailed design is complete, which will confirm whether groundwater is likely to be intersected during excavation.
A Dewatering Plan will be prepared as part of the CEMP if dewatering is required, to ensure extracted water is disposed of appropriately to avoid impacting surface water quality and sensitive habitats.
The excavated water would be tested upon extraction and only be discharged to ground if of suitable quality (subject to regulatory approvals and licences). The water would be discharged downslope to prevent runoff into the excavation, away from steep slopes and drainage lines where concentrated flows could lead to erosion and sedimentation and away from sensitive habitats.

7.6 Residual Risk Assessment

The residual risk assessment in **Table 7.3** provides revised risk ratings with consideration of the mitigation and management measures discussed in **Section 7.5**. Residual risk ratings range from negligible to low, with all risks able to be reduced to ALARP. No significant residual risks are predicted to occur.

Table 7.3 Residual Assessment of Risks Associated with Surface Water and Groundwater

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measure	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Construction								
W1	Earthwork activities generate soil that increases sedimentation of nearby waterways when transported off site.	High	No	• Industry best practice CEMP will be implemented that includes a detailed ESCP (which builds upon the preliminary ESCP in **Appendix G3**) that documents the controls to be implemented to minimise and manage erosion and sedimentation and to contain sediment-laden runoff. Refer to S1 (**Table 6.3**, **Section 6.6**) for detail about the standard erosion and sediment controls to be implemented • The ESCP will also detail any site-specific erosion and sediment controls that may be required, such as: o Temporary waterway crossings may be installed for site access tracks to avoid vehicles needing to cross steep or swampy watercourses. This would involve the use of aggregate to provide a stable surface and water diverting structures such as swales to divert runoff away from the crossing.	Unlikely	Moderate	Low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measure	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				o Any single disturbance area that is larger than 1 ha will require a sediment basin as per Chapter 5 of the Environment Protection Guidelines for Construction and Land Development in the ACT (EPA, 2022a). The design details for any sediment basins will be included in the ESCP. • The CEMP/ESCP will document the controls to be implemented for stockpile and spoil management, transport and disposal. Refer to S1 (**Table 6.3**, **Section 6.6**) for detail about these controls. • The CEMP/ESCP will detail the monitoring and maintenance requirements for the erosion and sediment controls during Proposal construction. Refer to S1 (**Table 6.3**, **Section 6.6**) for detail about the monitoring requirements.				
W2	Fuel or chemical spills, or disturbance of contaminated material, lead to contamination of groundwater and/or nearby waterways, which could result in environmental degradation and fines under the EP Act.	Low	No	• Intrusive soil investigations will be undertaken as part of the DA process in Blocks 1614, 1602 and 1461 Belconnen to confirm whether any contamination is present in the Proposal Area. Any contaminated material identified during the intrusive investigations will be avoided if possible through Proposal re-design, or managed in accordance with controls specified in the CEMP.	Remote	Moderate	Very low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measure	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				• The CEMP will contain an Unexpected Finds Protocol in the event that contaminated soils or other materials are exposed during the intrusive investigations or Proposal construction activities which are confirmed or suspected of contamination. Refer to S2 (**Table 6.3**, **Section 6.6**) for further detail. • The CEMP will also document procedures for the transport, storage and management of fuels and any chemicals to be used during Proposal construction, including measures to manage accidental chemical spills or leaks (e.g. through the supply and maintenance of spill kits). It will include a procedure for remediation if any contamination occurs as a result of the Proposal.				
W3	Any groundwater dewatering required is discharged directly or indirectly to surface waterbodies, impacting the water quality.	Low	No	• Geotechnical investigations will be undertaken at each new tower location once detailed design is complete, which will confirm whether groundwater is likely to be intersected during excavation and require dewatering. • A Dewatering Plan will be prepared as part of the CEMP if dewatering is required, to ensure extracted water is disposed of appropriately to avoid impacting surface water quality and sensitive habitats o The excavated water would be tested prior upon extracted and only discharged to ground if of suitable quality (subject to regulatory approvals and licences).	Remote	Minor	Negligible	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measure	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				o The water would be discharged downslope of the tower to prevent runoff into the excavation, away from steep slopes and drainage lines where concentrated flows could lead to erosion and sedimentation and away from sensitive habitats.				
W4	Any groundwater dewatering required results in local changes to groundwater levels.	Very low	No	• Geotechnical investigations will be undertaken at each new tower location once detailed design is complete, which will confirm whether groundwater is likely to be intersected during excavation and require dewatering. • A Dewatering Plan will be prepared as part of the CEMP if dewatering is required, to ensure only the require amount of groundwater is extracted to minimise changes to groundwater levels. Refer to W3 for more information on the Dewatering Plan.	Unlikely	Minimal	Negligible	Yes
W5	Water generated during fire suppressing activities resulting from construction activities, results in run-off, and potential environmental degradation.	Medium	No	• Refer mitigation measures for W1 and HR1.	Unlikely	Moderate	Low	Yes

8.0 Aboriginal and European Heritage

Chapter Summary
This chapter investigates the presence of any Aboriginal or European heritage values within the Proposal Area and surrounding region and provides an assessment of potential impacts on these values.

8.1 Preliminary Risk Assessment

An assessment of Proposal risks associated with Aboriginal and European heritage values is provided in **Table 8.1**. The risk ratings range from very low to medium, with significant impacts possible from construction activities that could destroy or damage Aboriginal cultural heritage items. The Proposal has been designed to avoid adverse impacts on the heritage values of European heritage places, thus these risks are ALARP without the implementation of any mitigation or management measures.

Section 8.2 to **Section 8.4** provide a detailed assessment of this risk. The residual risk assessment in **Section 8.6** provides a revised risk rating based on the mitigation and management measures proposed in **Section 8.5**.

Table 8.1 Preliminary Assessment of Risks Associated with Heritage Values

ID	Risk Scenario	Preliminary Risk Assessment			
		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Design					
H1	The location of the Proposal results in adverse impacts on the heritage values of European heritage places.	Remote	Moderate	Very low	Yes
Construction					
H2	Construction activities result in the destruction or damage of Aboriginal cultural heritage items.	Unlikely	Major	Medium	No
H3	Construction activities result in destruction or damage of European heritage places.	Unlikely	Moderate	Low	No
Operation					
H4	Once operational, the Proposal results in adverse impacts on the heritage values of European heritage places.	Remote	Moderate	Very low	Yes

8.2 Investigations

A CHA was undertaken by Past Traces for the Proposal (see **Appendix G4**). It involved a desktop review of heritage databases (see **Table 8.2**), a literature review of Aboriginal and European archaeological and historical information relevant to the Proposal Area and surrounds, and field surveys to identify any Aboriginal items or sites that could be impacted by the Proposal.

Field surveys were initially undertaken in January 2022, covering a 10 m-wide corridor along the sections of Lines 1 and 7 proposed for removal, and a 50 m radius around existing tower locations. Surveys were also completed along the new alignment routes, covering a width of 50 m along the length of the new alignments and the new tower locations. The findings of these surveys informed the revision of the proposed alignments to minimise potential impacts, as detailed in **Section 2.4**.

Additional surveys were undertaken in March and September 2023 to cover changes made to the new alignment routes and the full construction footprint as assessed in this EIS. All field surveys were undertaken in the presence of representatives from the ACT Representative Aboriginal Organisations (RAOs). This is discussed further in **Section 8.2.1**.

The European heritage assessment in the CHA involved an assessment against the statement of significance of heritage listings for places located near the Proposal.

Table 8.2 Data Sources Used for the CHA

Data Source	Description
NSW Aboriginal Heritage Information Management System (AHIMS)	Holds information about recorded Aboriginal sites, objects and declared Aboriginal places in NSW.
NSW State Heritage Inventory	Holds information about protected heritage items in NSW.
Australian Heritage Database	Holds information about natural, historic and indigenous places that are of significance to Australia and the Australian people. Includes places in the World Heritage List, National Heritage List, Commonwealth Heritage List, and others.
ACT Heritage Register	Holds information about protected cultural, natural and historical heritage items in the ACT.

8.2.1 RAO Consultation

Consultation with the Aboriginal community has been undertaken in accordance with ACT Heritage requirements and the Heritage Act. Four RAOs have stated an objective to represent traditional Aboriginal cultural values and interests in the ACT. These groups have been recognised by the Minister for Heritage as RAOs as defined under the Heritage Act. These RAOs are:

- Mirrabee (formerly known as the Little Gudgenby River Tribal Council)
- King Brown Tribal Group
- Buru Ngunawal Aboriginal Corporation
- Ngarigu Currawong Clan.

All RAOs were consulted for the Proposal. The RAOs participated in the field survey of the Proposal Area and provided guidance regarding assessments of significance and appropriate management strategies. No heritage concerns were expressed during any stage of survey. A summary of consultation with RAOs is provided in Appendix 1 of the CHA (**Appendix G4**).

In addition to the discussions held on site, three different versions of the draft CHA were supplied to the RAOs for comment, with follow-up phone calls made to each RAO to confirm if they had any concerns with the report's findings or recommended management strategies. No concerns were raised, and some RAOs stated that they agreed with the report's recommendations.

8.3 Historical Context and Known Values

8.3.1 Aboriginal Heritage

The Ngunnawal people are identified as the major language group within the Canberra region. However, the Ngambri people also hold affiliation with the central area of Canberra, where early accounts of settlers often refer to the group as the Ngambri or Ngamberry. Both groups hold cultural connections through the Canberra region, and the ACT Government currently accepts the ACT to be Ngunnawal/Ngambri Country (Past Traces, 2024).

The Molonglo and Murrumbidgee Rivers represent the boundary between Ngunnawal and Ngarigo Nations. Descendants of both Aboriginal groups hold cultural affiliation with the Proposal Area and have been consulted for the Proposal (Past Traces, 2024).

The ACT and NSW Aboriginal heritage databases show that there are numerous Aboriginal heritage sites located through the landscape surrounding the Proposal Area. As shown in **Figure 8.1**, six of these sites (CR1, CR2, RC26, CAS361, MRC126 and PHIF1) are recorded within the Proposal Area but outside the construction footprint. None of these sites were re-identified by Past Traces during the field surveys for the Proposal's CHA.

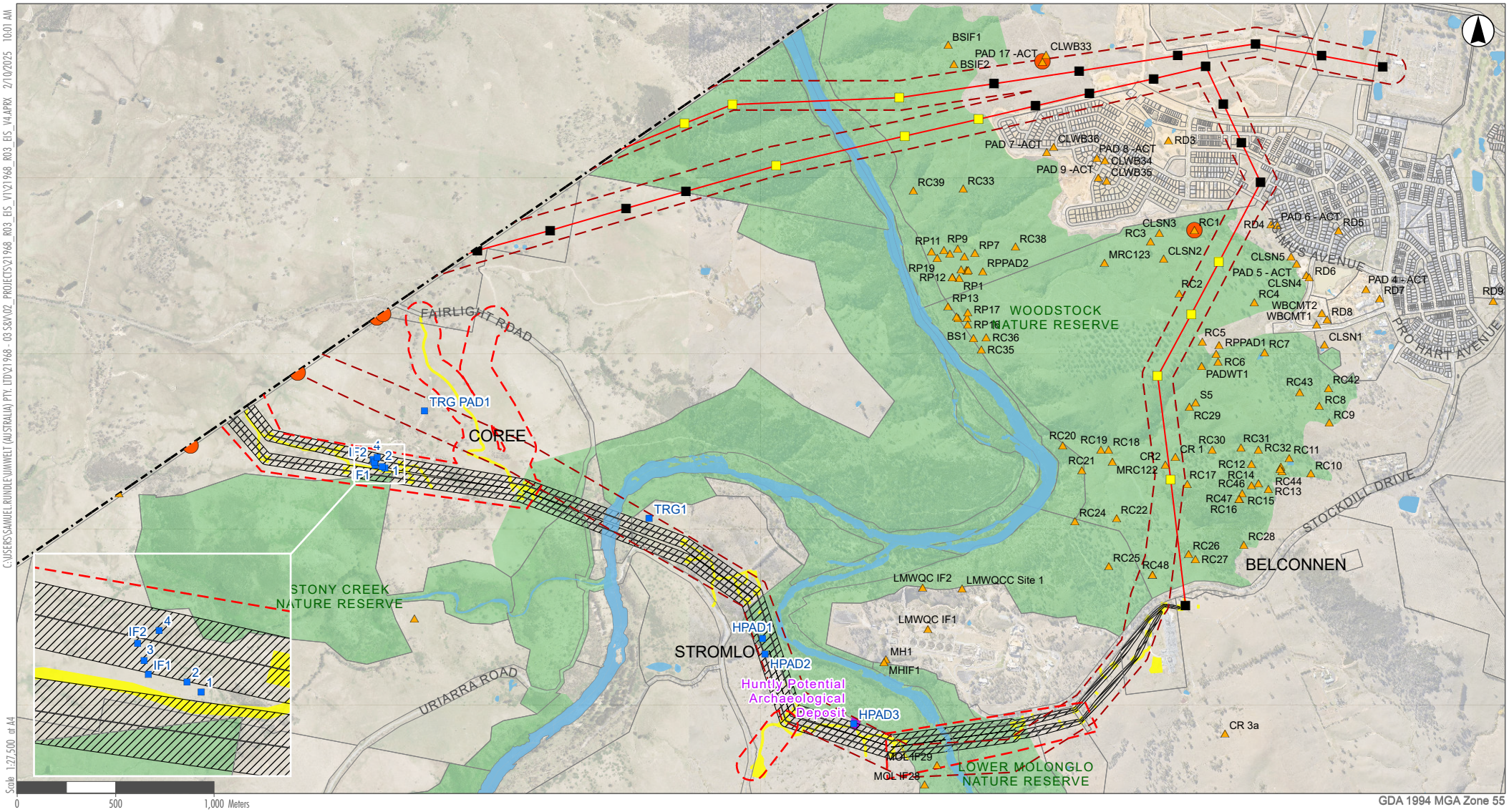
During Past Traces' 2022 field surveys, one Aboriginal heritage site (TRG1) and four areas of potential archaeological deposit (PAD) (TRGPAD1, HPAD1, HPAD2 and HPAD3) were newly identified (see **Figure 8.1**). However, following the changes to the Proposal design, TRG1 and TRGPAD1 have been avoided and are no longer within the Proposal Area. The 2023 field surveys identified one additional site (TRG2) consisting of surface artefacts with an associated area of PAD, situated within the proposed access track from Fairlight Road (see **Figure 8.1**).

The Aboriginal sites situated within or near the Proposal Area are summarised in **Table 8.3**.

Table 8.3 Summary of Aboriginal Sites Near the Proposal Area

Site / PAD ID	Type	Observed by Past Traces	Preservation rating	Location
CR1	Artefact scatter	No	Disturbed	Outside the Proposal Area – Near one of the towers to be removed but outside the construction footprint
CR2	Isolated find	No	Disturbed	Outside the Proposal Area – Near one of the towers to be removed but outside the construction footprint
RC26	Artefact scatter	No	Disturbed	Outside the Proposal Area – Near one of the lines to be removed but outside the construction footprint
CAS361	Artefact scatter	No	Disturbed	Outside the Proposal Area – Near one of the towers to be removed but outside the construction footprint

Site / PAD ID	Type	Observed by Past Traces	Preservation rating	Location
MRC126	Artefact scatter	No	Disturbed	Within the Proposal Area – Near one of the towers to be installed but outside the construction footprint
PHIF1	Isolated find	No	Disturbed	Outside the Proposal Area (in NSW) – Near one of the towers to be removed but outside the construction footprint
TRG1	Isolated find	Yes – new site	Highly disturbed	Not within Proposal Area
TRG2	Artefact scatter and PAD	Yes – new site	Disturbed	Within proximity of construction works (7 m from an access track)
TRGPAD1	PAD (moderate potential for subsurface deposits)	Yes – new site	Slightly disturbed	Not within Proposal Area
HPAD1	PAD (moderate potential for subsurface deposits)	Yes – new site	Slightly disturbed	Within Proposal Area
HPAD2	PAD (moderate potential for subsurface deposits)	Yes – new site	Slightly disturbed	Within Proposal Area
HPAD3	PAD (moderate potential for subsurface deposits)	Yes – new site	Slightly disturbed	Within Proposal Area



Legend

- Demolition Sites
- Tower Foundations to be Left In Situ
- New Transmission Lines
- Transmission Lines to be Removed
- Construction Footprint
- Operational Footprint
- CHA Study Area - 2022
- CHA Study Area - 2023
- New Sites
- Previously Recorded Sites
- Salvaged Sites
- Huntly Potential Archaeological Deposit
- Property Boundaries
- ACT/NSW Border
- Watercourses
- Nature Reserves

FIGURE 8.1

Aboriginal Sites Near the Proposal Area

Image Source: Nearmap (2023) **Data source:** ACT Government (2023)

8.3.2 European Heritage

The majority of the Proposal Area is subject to one or more heritage listings under the ACT Heritage Register. Only one of these heritage listings has been registered and is located sufficiently close to the Proposal to warrant consideration in this EIS – the Huntly pastoral property (heritage listing Item 20031). Additionally, the NSW/ACT border markers located along the border near Ginninderry have been nominated to the ACT Heritage Register but are not yet registered. These two places are described below.

Two other listings registered on the ACT Heritage Register are relevant to the Proposal Area but relate to Aboriginal places. These have been addressed in **Section 8.3.1** in relation to Aboriginal heritage.

Huntly is also listed on the Australian Heritage Database (Place ID 19432), as a 'Indicative Place' on the Register of the National Estate, which is a non-statutory archived register. An Indicative Place has not formally been nominated or registered to the National Heritage List, which means that Huntly does not have statutory protection at the national level. No heritage places are registered on the Australian Heritage Database in the vicinity of the Proposal Area.

8.3.2.1 Huntly

The Huntly listing on the ACT Heritage Register extends across Blocks 412, 413, 426, 487–490 and adjacent road reserves in the District of Stromlo, of which Blocks 487 and 488 are in the Proposal Area. As shown in **Figure 8.2**, the new alignments cross over these blocks.

The Statement of Significance for Huntly (ACT Heritage Council, 1997) states that Huntly has historic associations with the development of the Limestone Plains and associational significance with local figures of the pastoral era. It is a representative element of the rural setting of the National Capital, and is an example of a 20th Century grazing property, which was a characteristic land use of the ACT before the expansion of the National Capital in the second half of the century. The homestead garden merges the European gardenesque design with the Australian landscape. The aesthetics are consistent with late 20th Century standards appropriate for staging cultural, political and social events.

The following features are identified as intrinsic to the heritage significance of Huntly:

- The c.1933 main house and the Lee House.
- The carports, garages, farm buildings and garden sheds associated with these houses.
- The c.1935 manager's cottage.
- Silos and stables associated with the manager's cottage.
- The c.1948 shearing shed and holding pens.
- A c.1961 cottage, formerly shearers' accommodation, outhouses and a meat house associated with the shearing shed.
- Stone remains of a shepherd's hut standing on the arms of Cliffe Creek.
- Plantings around the buildings of indigenous plants and exotics, including windbreaks of *Cupressus arizonica*.

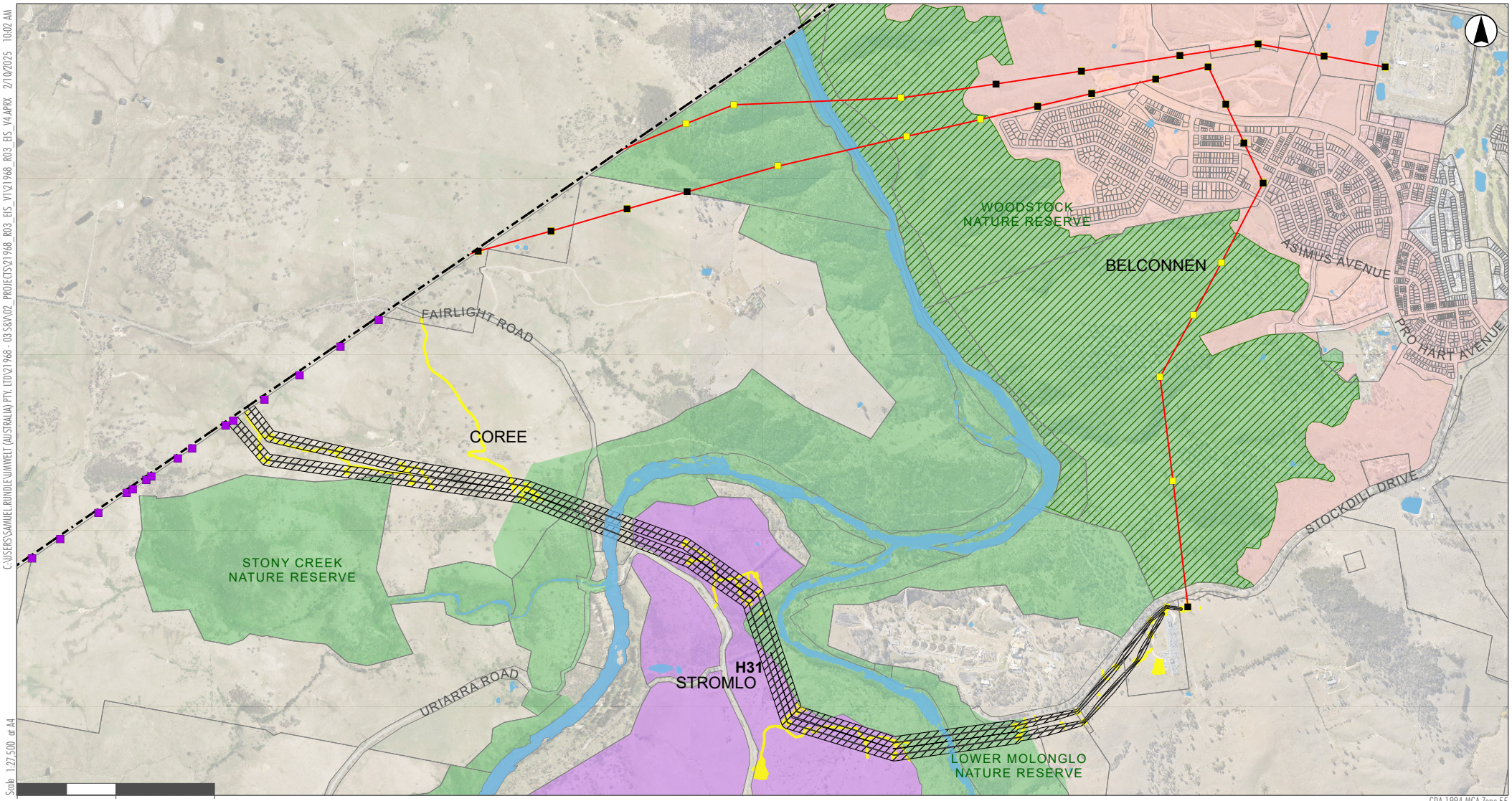


FIGURE 8.2

European Heritage Places
Near the Proposal Area

Image Source: Nearmap (2023) Data source: ACT Government (2022)

In accordance with the specific requirements included in the entry to the ACT Heritage Register, the requirements are essential to the conservation of the heritage significance of Huntly:

Huntly is to be preserved as a rural property. The garden is to be maintained according to the design of Mr John Gale. It should be noted that conditions of the Plans of Management for the Murrumbidgee River Corridor (Stony Creek Reserve) and the Lower Molonglo River Corridor apply to those parts of the property which are in the two River Corridors and the Stony Creek Reserve.

i. *Huntly is to be maintained predominantly as a grazing property and for other uses consistent with a rural property, subject to the requirements for the management of the Murrumbidgee River Corridor and the Lower Molonglo River Corridor in relation to those parts, which are designated as Public Land.*
ii. *The Garden shall be conserved and appropriately maintained.*
iii. *All features intrinsic to the significance of the place are to be conserved and appropriately maintained.*

Plate 8.1 Specific Requirements for the Huntly ACT Heritage Listing (ACT Heritage Council, 1997)

Although the Proposal Area crosses the blocks in the Huntly heritage listing, the Proposal itself is not located close to the Huntly heritage features. The closest feature to the Proposal is the shearing shed, which is approximately 2.6 km from the new alignments.

Section 8.4.2 provides an assessment of the Proposal against the specific requirements of the Huntly heritage listing.

8.3.2.2 NSW/ACT Border Markers

The NSW/ACT border markers located along the border northwest of Ginninderry, date from 1913–15 and are associated with the establishment of the National Capital and its surrounding territory (Unknown nominator, n.d.). They are among the earliest surviving structures erected after the founding of the ACT. The markers contain many good examples of the type of markers used by surveyors of the time, including some rare mile reference trees whose engravings display skilful use of mallet and chisel (Unknown nominator, n.d.).

The NSW/ACT border markers at this location have been nominated but not yet registered to the ACT Heritage Register, so are not currently afforded any statutory protection. However, the markers are still considered to have heritage significance and have been treated the same as any listed heritage place in this EIS (i.e. with impacts to be avoided in the first instance).

The NSW/ACT border markers are located in the Proposal Area but more than 67 m from the proposed works (see **Figure 8.2**).

8.4 Potential Impacts

Potential impacts of the Proposal on Aboriginal and European heritage values, as identified in the risk assessment in **Section 4.2** and summarised in **Section 8.1**, include:

- Adverse impacts on the heritage values of European heritage places
- Destruction or damage of Aboriginal cultural heritage or European heritage places during construction.

These potential impacts are assessed in detail below.

8.4.1 Aboriginal Heritage

Of the four Aboriginal heritage sites confirmed within the Proposal Area (see **Table 8.3**), only TRG2 (artefact scatter and PAD) is within proximity of the construction footprint where impacts could occur (TRG2 is within 7 m of a proposed access track). No other sites are near the construction footprint where impacts could occur, either from direct disturbance or indirect impacts such as from dust deposition.

Although direct impacts are not anticipated on TRG2 due to its distance from the construction footprint, protective barrier fencing will be installed to prevent any accidental impacts. This is discussed further in **Section 8.5**. With this mitigation measure in place, potential impacts of the Proposal on Aboriginal heritage sites would be limited to any impacts that could occur on unexpected finds during construction.
An Unexpected Finds Protocol will be established to manage this risk (see **Section 8.5** for more detail).

8.4.2 European Heritage

The new alignments cross the northern corners of Blocks 487 and 488 in the District of Stromlo, which are both subject to the Huntly heritage listing on the ACT Heritage Register. However, the proposed works are located approximately 2.6 km from the nearest heritage feature (the shearing shed), so would not have any adverse impacts on the heritage values of Huntly when assessed against the specific requirements of the listing replicated in **Plate 8.1**. The Proposal (when operational) or its construction activities would not:

- prevent the property from being maintained for grazing
- prevent the conservation of the Garden, or
- prevent the conservation of all features intrinsic of the place (the main house, Lee house, carports etc. – see **Section 8.3.2.1**).

The NSW/ACT border markers extend across Block 88 Coree in the Proposal Area but are more than 70 m from the proposed construction works. Due to this distance, the markers would not be impacted by the Proposal during construction.

8.5 Mitigation and Management Measures

The current design of the Proposal avoids direct impacts to all identified Aboriginal and European heritage sites. The CHA (**Appendix G4**) confirmed that as impacts can be avoided on Aboriginal heritage sites, no formal submission of a Statement of Heritage Effect (SHE) is required. However, should impacts become unavoidable, an Excavation Permit from ACT Heritage would be required to undertake further works consisting of surface collection and/or subsurface testing. Any alteration to the construction footprint of the Proposal would also require additional assessment and updates to the CHA.

The CHA was submitted to ACT Heritage on 19 February 2024 to seek endorsement to proceed with the proposed works. No works will commence until such endorsement has been received.

Protective barrier fencing consisting of high visibility flagging and star pickets will be installed around known heritage sites located within 20 m of proposed works, with a minimum buffer of 5 m (10 m if possible) to prevent any accidental impacts. The fencing will be demarcated onsite and installed by heritage specialists, with RAOs invited to provide advice in relation to the protection of Aboriginal heritage sites.

An Unexpected Finds Protocol will also be included within the CEMP, which details the procedure to be implemented in the event that any previously unidentified Aboriginal heritage items (or objects suspected of having heritage value) are identified during construction. This will build upon the Unexpected Discovery Plan provided at Appendix 2 of the CHA (**Appendix G4**).

The location of the NSW/ACT border markers will be marked on final Proposal plans and within the CEMP as areas to be avoided. No other mitigation measures are proposed in relation to European heritage as impacts are not anticipated.

8.6 Residual Risk Assessment

The residual risk assessment in **Table 8.4** provides revised risk ratings with consideration of the mitigation and management measures discussed in **Section 8.5**. Residual risk ratings range from very low to low, with all risks able to be reduced to ALARP. No significant residual risks are predicted to occur.

Table 8.4 Residual Assessment of Risks Associated with Heritage Values

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Design								
H1	The location of the Proposal results in adverse impacts on the heritage values of European heritage places.	Very low	Yes	• No impacts are anticipated on European heritage places due to the distance between the Proposal and these places. • Any major future design changes (e.g. re-routing of the new alignments) will be reassessed in a revised CHA against the listed heritage values of the Huntly property and the nominated heritage values of the NSW/ACT border marker (or listed heritage values once these become available), to avoid adverse impacts. Advice will be sought from ACT Heritage if impacts are unable to avoided.	Remote	Moderate	Very low	Yes
Construction								
H2	Construction activities result in the destruction or damage of Aboriginal cultural heritage items.	Medium	No	• The Proposal design assessed in this EIS has undergone multiple iterations to avoid impacts on Aboriginal cultural heritage sites. As such, no impacts are anticipated. • Protective barrier fencing consisting of high visibility flagging and star pickets will be installed around known heritage sites located within 20 m of proposed works, with a minimum buffer of 5 m (10 m if possible) to be maintained to prevent any accidental impacts. The fencing will be demarcated onsite and installed by heritage specialists in accordance with advice from RAOs.	Remote	Major	Low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				• An Unexpected Finds Protocol will be included within the CEMP, which details the procedures to be implemented in the event that any previously unidentified Aboriginal heritage items (or objects suspected of having heritage value) are identified during construction. This will build upon the Unexpected Discovery Plan provided at Appendix 2 of the CHA (**Appendix G4**). • Any future design changes will be reassessed in a revised CHA and discussed with the RAOs. This will include reconsideration of whether archaeological test excavations and/or salvage, and preparation of a SHE, are required.				
H3	Construction activities result in the destruction or damage of European heritage items.	Low	No	• No impacts are anticipated on European heritage places due to the distance between the Proposal and these places. • Protective barrier fencing consisting of high visibility flagging and star pickets will be installed around any NSW/ACT border markers located within 20 m of proposed works, with a minimum buffer of 5 m (10 m if possible) to be maintained to prevent any accidental impacts. The fencing will be demarcated onsite and installed by heritage specialists.	Remote	Moderate	Very low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Operation								
H4	Once operational, the Proposal results in adverse impacts on the heritage values of European heritage places.	Very low	No	• No impacts are anticipated on European heritage places due to the distance between the Proposal and these places. • Refer to H1 for measures that will be implemented during the Proposal's design stage to avoid adverse impacts on the heritage values of European heritage places in the event that any major design changes are made to the Proposal (e.g. re-routing of the new alignments).	Remote	Moderate	Very low	Yes

9.0 Landscape and Visual

Chapter Summary
This chapter provides an assessment of potential landscape and visual impacts associated with the Proposal. It considers impacts associated with construction activities including vegetation clearance, soil exposure and vehicle movements, and visual amenity of the Proposal once operational. Potential adverse impacts associated with the new alignments and beneficial impacts associated with removing the existing lines have both been considered.

9.1 Preliminary Risk Assessment

An assessment of Proposal risks associated with landscape character and visual amenity is provided in **Table 9.1**. The risk ratings range from very low to high, with significant impacts possible due to a potential loss of landscape character and visual amenity at all stages of the Proposal.

Section 9.2 to **Section 9.4** provide a detailed assessment of those risks. The residual risk assessment in **Section 9.6** provides revised ratings for each risk based on the mitigation and management measures described in **Section 9.5**.

Table 9.1 Preliminary Assessment of Risks Associated with Landscape Character and Visual Amenity

ID	Risk Scenario	Preliminary Risk Assessment			
		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Design					
L1	The location of the Proposal results in a loss of visual amenity for local residents and users of the surrounding area and impacts on landscape character.	Possible	Moderate	Medium	Yes
L2	Cumulative visual impacts occur as a result of the Proposal and other developments in the region.	Possible	Moderate	Medium	Yes
Construction					
L3	Vegetation clearance results in a loss of visual amenity for local residents and impacts on landscape character.	Unlikely	Minor	Very low	Yes
L4	Construction of the Proposal results in a loss of visual amenity for local residents and users of the surrounding area and impacts on landscape character.	Possible	Minor	Low	Yes
L5	Cumulative visual impacts occur as a result of Proposal construction and other developments in the region.	Possible	Moderate	Medium	Yes

ID	Risk Scenario	Preliminary Risk Assessment			
		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Operation					
L6	Once operational, the Proposal results in a loss of visual amenity for local residents and users of the surrounding area and impacts on landscape character.	Likely	Moderate	High	Yes
L7	Cumulative visual impacts occur as a result of operation of the Proposal and other developments in the region.	Possible	Moderate	Medium	Yes

9.2 Investigations

A Landscape and Visual Impact Assessment (LVIA) was undertaken by dsb Landscape Architects to assess potential landscape character and visual amenity impacts arising from the Proposal (see **Appendix G5**). The assessment involved two separate assessments to differentiate between landscape character impacts and visual amenity impacts.

Landscape character refers to the aggregate of an area's built, natural and cultural character or sense of place; so a landscape character impact assessment helps to determine the overall impact of a proposal on how people think and feel about a place and how society values it, regardless of whether they are physically present (TfNSW, 2023). On the other hand, a visual impact assessment considers potential impacts on views, helping to determine the day-to-day visual effects of a development on people's views of the development area (TfNSW, 2023).

There are no ACT-specific guidelines for landscape character and/or visual impact assessment. As such, for the LVIA methodology comes from the Transport for NSW (TfNSW) Guideline for landscape character and visual impact assessment (the LVIA Guideline) (TfNSW, 2023). The LVIA Guideline is a high-level reference for preparing visual assessments in the absence of other specific guides.

The LVIA was based on site visits, photographs and publicly available information of the Proposal Area and surrounds. The impact assessments were informed by photomontages prepared by dsb Landscape Architects which illustrate potential views of the Proposal once operational (reproduced in **Section 9.3**).

As discussed in **Section 2.4**, the Proposal has been developed over several years through an iterative design process. This has resulted in design changes that reduced potential visual impacts on landholders and landscape users. The purpose of a LVIA is typically to improve design outcomes and minimise adverse visual impacts of the Proposal by identifying potential impacts and suitable mitigation measures to be incorporated into the design. As the Proposal's LVIA is based on the final Proposal design, which incorporates all of the avoidance measures identified over years of design work, there is limited opportunity to further minimise residual visual impacts. Mitigation is discussed further in **Section 9.5**.

Given the progressed nature of the Proposal design, a modified methodology for the LVIA was applied, which included:

- Identification and ranking of view locations (viewpoints) – **Section 9.3.2**.
- Assessment of potential landscape and visual impacts at those viewpoints – **Section 9.4**.
- Identification of mitigation options for viewpoints with significant visual impacts – **Section 9.5**.

9.2.1 Landscape Character

The level of impact on landscape character is generally determined by a combination of factors that make up the characteristics of the area, including:

- The natural and/or cultural values of the landscape.
- The degree of visual contrast between the Proposal and the surrounding landscape.
- The extent of change associated with the Proposal, such as earthworks, vegetation removal, and loss of cultural elements.

A landscape character impact assessment is inherently a cumulative impact assessment as it considers the impact of a development on the existing and future landscape, which may already contain, or be planned to contain, other developments.

Landscape character zones are often used to divide a study area into smaller areas of broadly homogenous characteristics or zones of strongly defined spatial qualities (TfNSW, 2023). For the purposes of this landscape character assessment, three landscape zones were identified: semi-rural, light industrial; nature reserve; and residential. A landscape character assessment was undertaken for each of those zones, using the information provided in the LVIA report (**Appendix G5**).

9.2.2 Visual Amenity

Viewpoints identify the locations from which a proposed development may be visible. They typically include residential properties, public buildings such as schools or places of worship, public places such as parks and walking tracks, heritage places, and businesses. Viewpoints considered in this visual impact assessment are described in **Section 9.3.2**.

It is important to recognise that visual impacts are also determined by 'the journey' experienced by the viewer. This journey is fundamentally different depending on the way in which the viewer is using the area, for example, whether they are driving, riding, walking or remaining stationary.

For the purposes of this visual impact assessment, the following aspects have been considered for each viewpoint:

- Location of the Proposal relative to the viewpoint.
- Physical scale of the Proposal.
- Visibility of the Proposal from the viewpoint.
- Primary type of viewer expected at the viewpoint, e.g. worker, frequent user or passer-by.

- Likely number of viewers at the viewpoint, generally based on traffic levels provided in the Proposal's Traffic Impact Assessment (TIA) (**Appendix G7**).

Viewpoints were given a landscape and visual impact rank (LVIR) in the LVIA report (**Appendix G5**) based on several criteria, namely:

- The number of viewers at a given location – the higher the number of viewers; the greater the impact.
- The proximity of the viewpoint to the infrastructure – the closer the viewpoint to the altered view (e.g. new infrastructure); the greater the impact.
- The angle of the viewpoint to the predominance of the infrastructure in the view – e.g. views straight ahead have a greater impact than views at 90°.
- The nature of the change to the view, e.g. the introduction of new infrastructure, modification of existing infrastructure, or removal of existing infrastructure.
- New infrastructure has the greatest impact and infrastructure being removed has the least impact.
- New infrastructure has construction and operational impacts.
- Removal of existing infrastructure has construction impacts only.

The LVIR can be low, medium or high. The rankings used in the LVIA were allocated according to a sliding scale based on the following definitions:

- A viewpoint with a high LVIR would have the following characteristics:
  - Highest number of viewers.
  - Views of new infrastructure.
  - Closest distance to the infrastructure.
  - Direct view of the infrastructure.
- A viewpoint with a low LVIR would have the following characteristics:
  - Lowest number of viewers.
  - Views of infrastructure being removed.
  - Furthest distance from the infrastructure.
  - Indirect view of the infrastructure.
- A viewpoint with a medium LVIR would have characteristics that fall between those of a low and high LVIR.

Viewpoints with a high LVIR are considered to have a significant visual impact.

The potential visual impact of the Proposal on each viewpoint is discussed in **Section 9.4**.

9.3 Existing Conditions and Values

9.3.1 Landscape Character

The Proposal is located to the west of Ginninderry and Belconnen in the ACT, adjacent to the Molonglo and Murrumbidgee Rivers and extending to the ACT/NSW border to the west of the Murrumbidgee River. The principal land uses within, and adjacent to, the Proposal Area include rural grazing on elevated land adjacent to the Molonglo and Murrumbidgee River valleys, and nature reserves along the river corridors and adjacent to Ginninderry (the GCC). The landscape also contains a range of utility infrastructure which are prominent from various viewpoints, including the industrial LMWQCC, Stockdill and Canberra Substations, the proposed Territory Battery adjacent to the Stockdill Substation, and several other high voltage transmission lines and smaller powerlines near the alignments to be removed.

A significant crossing location of the Murrumbidgee River is at Uriarra Crossing (see **Figure 9.1**). Well patronised recreation reserves are located at Uriarra Crossing on both sides of the river. Uriarra Road and Fairlight Road are significant rural transport corridors into Canberra and are the principal routes for movement and landscape perception throughout the Proposal Area. Fairlight Road provides access to Wee Jasper and Yass in NSW, as well as rural areas within the ACT to the west of the Murrumbidgee River. Uriarra Road provides access to Uriarra Village and other rural areas, as well as national parks in the Brindabella Mountain Range. Parkwood Road links the Ginninderry urban development directly to NSW and provides views towards the existing Lines 1 and 7 near the Canberra Substation and back towards suburbia. These roads provide wide distant views of the surrounding rural landscapes and close intimate views of river valleys and crossings.

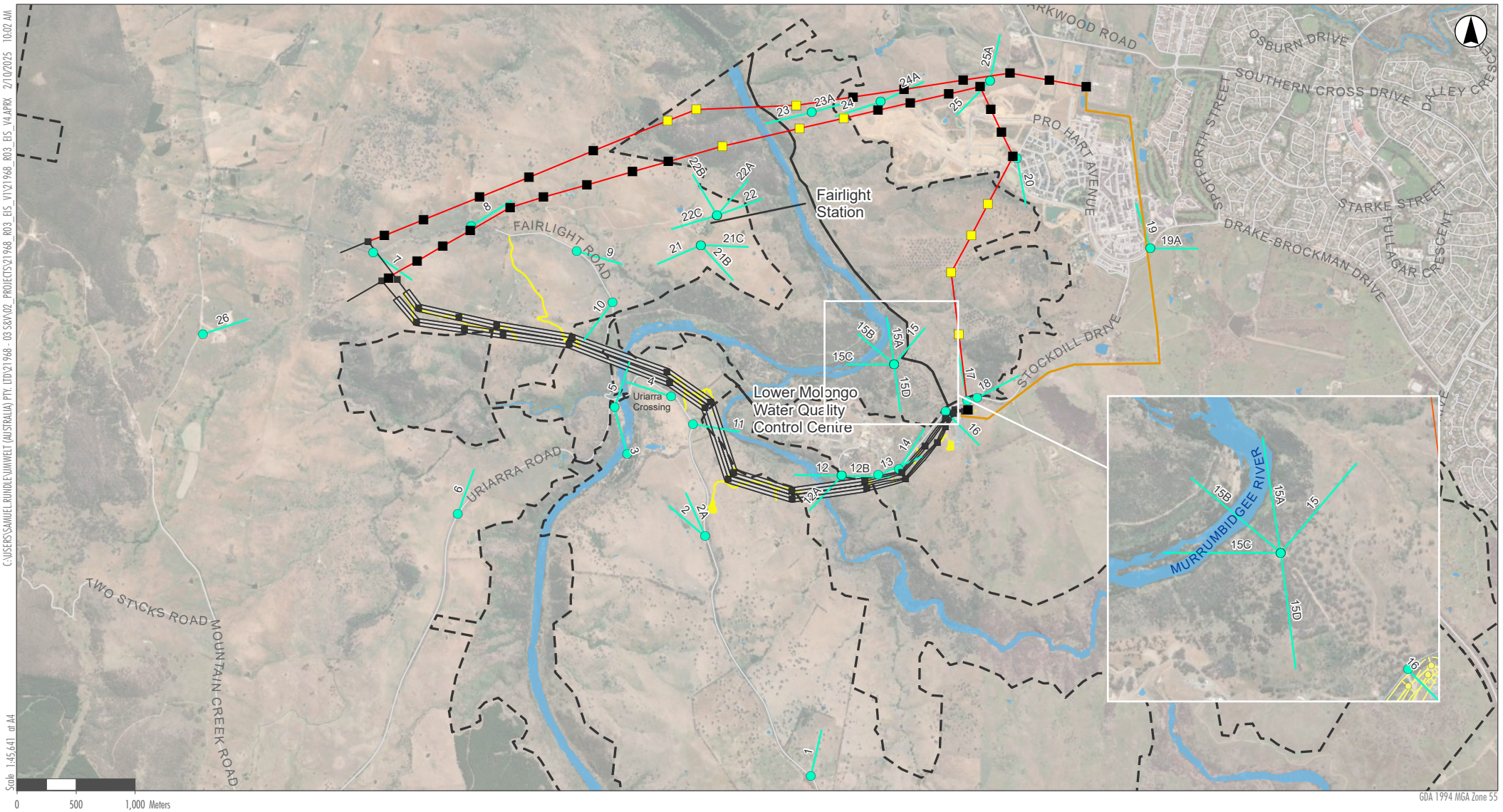
As shown in **Figure 9.1**, residents within the Proposal Area are scattered primarily on rural properties, with Fairlight Station located in the centre of the Proposal Area and other rural residences located along Fairlight Road and Mountain Creek Road to the west. Urban residences are located throughout the Ginninderry development near the Canberra Substation and Line 3C.

9.3.2 Viewpoints

A total of 26 viewpoints were identified which represent key views of the Proposal. As shown in **Figure 9.1**, most of these viewpoints would have views towards the new alignments, but some have views of the existing lines to be removed. The viewpoints include both fixed points and routes of interest including roads, public use areas (walking tracks and reserves) and rural residences (see **Table 9.2**). The typical types of viewers would range from regular users (workers or residents) to passers-by (tourists such as bushwalkers), and stationary people (such as sightseers).

Viewer numbers at each viewpoint were determined based on the type of viewer for that particular place. For example, for viewpoints along roadsides, viewer numbers were based on road vehicle counts taken from the TIA, whereas for viewpoints at scenic locations, viewer numbers were based on reserve visitor information supplied by PCS.

Photomontages which illustrate potential views of the Proposal once constructed are provided in **Section 9.4**, providing examples of high, medium and low LVIR viewpoints, respectively. A photomontage for every viewpoint is provided in Section 7 of the LVIA report at **Appendix G5.**



Legend

- Demolition Sites
- Tower Foundations to be Left In Situ
- New Alignment
- Transmission Lines to be Removed
- Line 3C Alignment – subject to separate approvals
- Construction Footprint
- Viewpoint Location
- Viewpoint Direction
- Roads
- ACT/NSW Border
- Watercourses

FIGURE 9.1

Viewpoint Locations and Perspectives

Image Source: ESRI (2023) Data source: ACT Government (2023)

Table 9.2 Key Viewpoints of the Proposal Area

ID	Viewpoint	Angle of View (Degrees)	Proximity to Proposal Infrastructure	Nature of Change to View	Type of Viewer	Number of Viewers
VP1	Uriarra Road	12 north	2,700 m	New transmission lines	• Regular user – resident. • Passer-by – tourist.	Up to 60 vehicles per hour (from TIA)
VP2	Uriarra Road, eastern side of the Murrumbidgee River	309 northwest	2,700 m	New transmission lines	• Regular user – resident. • Passer-by – tourist.	Up to 60 vehicles per hour (from TIA)
VP2A	Uriarra Road, eastern side of the Murrumbidgee River	329 northwest	1,400 m	New transmission lines	• Regular user – resident. • Passer-by – tourist.	Up to 60 vehicles per hour (from TIA)
VP3	Uriarra Crossing East Picnic Area	343 northwest	800 m	New transmission lines (conductors only)	• Regular user – resident. • Passer-by – tourist. • Stationary person – tourist.	221,300 annual visitors in 2011 and increasing (from PCS advice)
VP4	Uriarra Road	287 west	900 m	New transmission lines	• Regular user – resident. • Passer-by – tourist.	Up to 60 vehicles per hour (from TIA)
VP5	Uriarra Crossing West Picnic Area	17 north	350 m	New transmission lines (conductors only)	• Regular user – resident. • Passer-by – tourist. • Stationary person – tourist.	<50,000 annual visitors (estimate based on PCS advice for Uriarra Crossing East Picnic Area)
VP6	Uriarra Road, western side of the Murrumbidgee River	19 north	1,700 m	New transmission lines	• Regular user – resident. • Passer-by – tourist.	Up to 60 vehicles per hour (from TIA)
VP7	Fairlight Road	124 southeast	400 m	Cutover from existing Lines 1 and 7 to the new alignments	• Regular user – resident. • Passer-by – tourist.	Up to 60 vehicles per hour (from TIA)

ID	Viewpoint	Angle of View (Degrees)	Proximity to Proposal Infrastructure	Nature of Change to View	Type of Viewer	Number of Viewers
VP8	Fairlight Road	57 northeast	Adjacent	Lines being removed	• Regular user – resident. • Passer-by – tourist.	Up to 60 vehicles per hour (from TIA)
VP9	Fairlight Road	105 east	1,400–3,500 m	New transmission lines	• Regular user – resident. • Passer-by – tourist.	Up to 60 vehicles per hour (from TIA)
VP10	Fairlight Road	216 southwest	550 m	New transmission lines	• Regular user – resident. • Passer-by – tourist.	Up to 60 vehicles per hour (from TIA)
VP11	Uriarra Road, eastern side of the Murrumbidgee River	98 east	Adjacent–2200 m	New transmission lines	• Regular user – resident. • Passer-by – tourist.	Up to 60 vehicles per hour (from TIA)
VP12	LMWQCC / Stockdill Drive	270 west	450–4,000 m	New transmission lines	• Regular user – LMWQCC worker. • Passer-by – tourist.	Up to 40 vehicles per hour (from TIA)
VP12A	LMWQCC / Stockdill Drive	222 southwest	450 m	New transmission lines	• Regular user – LMWQCC worker. • Passer-by – tourist.	Up to 40 vehicles per hour (from TIA)
VP12B	LMWQCC / Stockdill Drive	90 east	Adjacent	New transmission lines	• Regular user – LMWQCC worker. • Passer-by – tourist.	Up to 40 vehicles per hour (from TIA)
VP13	Stockdill Drive adjacent to new alignments	66 east	Adjacent	New transmission lines	• Regular user – LMWQCC worker. • Passer-by – tourist.	Up to 40 vehicles per hour (from TIA)

ID	Viewpoint	Angle of View (Degrees)	Proximity to Proposal Infrastructure	Nature of Change to View	Type of Viewer	Number of Viewers
VP14	Stockdill Drive adjacent to new alignments	31 northeast	Adjacent	New transmission lines	• Regular user – LMWQCC worker. • Passer-by – tourist.	Up to 40 vehicles per hour (from TIA)
VP15	Shepherds Lookout	14 northeast	850–2,550 m	Lines being removed	• Stationary person – tourist. • High cultural value for local Indigenous people.	Estimated at 28,000 annual visitors based on the number of visitors to the GCC
VP15A	Shepherds Lookout	350 north	2,300 m	Lines being removed	• Stationary person – tourist. • High cultural value for local Indigenous people.	Estimated at 28,000 annual visitors based on the number of visitors to the GCC
VP15B	Shepherds Lookout	307 northwest	2,300 m	Lines being removed	• Stationary person – tourist. • High cultural value for local Indigenous people.	Estimated at 28,000 annual visitors based on the number of visitors to the GCC
VP15C	Shepherds Lookout	252 west	1,900–4,200 m	New transmission lines	• Stationary person – tourist. • High cultural value for local Indigenous people	Estimated at 28,000 annual visitors based on the number of visitors to the GCC
VP15D	Shepherds Lookout	185 south	1,600 m	New transmission lines	• Stationary person – tourist • High cultural value for local Indigenous people.	Estimated at 28,000 annual visitors based on the number of visitors to the GCC
VP16	Stockdill Drive	134 southeast	Adjacent	New transmission lines and connection at the Stockdill Substation	• Regular user – LMWQCC worker.	Up to 40 vehicles per hour (from TIA)
VP17	Stockdill Drive	348 north	Adjacent	Lines being removed	• Passer-by – tourist.	Up to 40 vehicles per hour (from TIA)

ID	Viewpoint	Angle of View (Degrees)	Proximity to Proposal Infrastructure	Nature of Change to View	Type of Viewer	Number of Viewers
VP18	Stockdill Drive	61 northeast	700 m	New conductor on Line 3C (subject to separate approvals)	• Regular user – LMWQCC worker.	Up to 40 vehicles per hour (from TIA)
VP19	Pro Hart Avenue	341 north	Adjacent	New conductor on Line 3C (subject to separate approvals)	• Regular user – resident. • Passer-by – tourist.	Up to 1,070 vehicles per hour (from TIA)
VP19A	Pro Hart Avenue	89 east	Adjacent	New conductor on Line 3C (subject to separate approvals)	• Regular user – resident. • Passer-by – tourist.	Up to 1,070 vehicles per hour (from TIA)
VP20	Bob Whan Street	168 southeast	Adjacent	Lines being removed	• Regular user – resident. • Stationary person – resident.	Strathnairn residents – 750 dwellings; 1,600 residents
VP21	Fairlight Residence southern side	222 southwest	1,000 m	New transmission lines	• Stationary person – resident.	<10 assumed (residents and visitors)
VP21B	Fairlight Residence southern side	136 southeast	2,600 m	Lines being removed	• Stationary person – resident.	<10 assumed (residents and visitors)
VP21C	Fairlight Residence southern side	104 east	2,700 m	Lines being removed	• Stationary person – resident.	<10 assumed (residents and visitors)
VP22	Fairlight Residence northern side	69 east	1,100 m	Lines being removed	• Stationary person – resident.	<10 assumed (residents and visitors)
VP22A	Fairlight Residence northern side	40 northeast	760 m	Lines being removed	• Stationary person – resident.	<10 assumed (residents and visitors)
VP22B	Fairlight Residence northern side	328 northwest	820 m	Lines being removed	• Stationary person – resident.	<10 assumed (residents and visitors)
VP22C	Fairlight Residence northern side	252 west	2,000 m	Lines being removed	• Stationary person – resident.	<10 assumed (residents and visitors)

ID	Viewpoint	Angle of View (Degrees)	Proximity to Proposal Infrastructure	Nature of Change to View	Type of Viewer	Number of Viewers
VP23	Macnamara	255 west	Adjacent	Lines being removed	• Regular user – resident. • Stationary person – resident.	FUA (future residents) – 1,078 dwellings, 2,800 residents
VP23A	Macnamara	73 east	Adjacent	Lines being removed	• Regular user – resident. • Stationary person – resident.	FUA (future residents) – 1,078 dwellings, 2,800 residents
VP24	Macnamara	251 west	Adjacent	Lines being removed	• Regular user – resident. • Stationary person – resident.	FUA (future residents) – 1,078 dwellings, 2,800 residents
VP24A	Macnamara	64 east	Adjacent	Lines being removed	• Regular user – resident. • Stationary person – resident.	FUA (future residents) – 1,078 dwellings, 2,800 residents
VP25	Macnamara	223 southwest	Adjacent	Lines being removed	• Regular user – resident. • Stationary person – resident.	FUA (future residents) – 1,078 dwellings, 2,800 residents
VP25A	Macnamara	11 north	Adjacent	Lines being removed	• Regular user – resident. • Stationary person – resident.	FUA (future residents) – 1,078 dwellings, 2,800 residents
VP26	Mountain Creek Road rural residential area	60 northeast	Distant	New transmission lines and lines being removed	• Regular user – resident. • Passer-by – tourist.	Up to 60 vehicles per hour (from TIA)

9.4 Potential Impacts

Potential landscape character and visual impacts of the Proposal, as identified in the risk assessment in **Section 9.1**, include:

- Adverse impacts on landscape character.
- Loss of visual amenity for local residents and users of the surrounding areas, including roads and nature reserves, during Proposal construction and operation.
- Cumulative visual amenity impacts as a result of the Proposal and other developments in the region.

Potential impacts on both landscape character and visual amenity would be different depending on the stage of the Proposal:

- Construction impacts would be associated with general construction works including minor vegetation clearance, excavation and fill, machinery use, the demolition of existing infrastructure, and the installation of new infrastructure.
- Operational impacts would relate to the addition of new overhead transmission lines within the landscape, spanning more than 11 km in total, and the removal of more than 12 km of existing transmission lines.

As the landscape is a mix of rural residential land and nature reserves, including well patronised recreation reserves, the Proposal would be noticeable to landholders and other users of the landscape. Potential impacts are discussed in detail below.

9.4.1 Landscape Character

As shown in **Table 9.4**, potential impacts of the Proposal on landscape character, across three landscape zones, were found to be between low and moderate during both construction and operation.

Potential impacts on semi-rural, light industrial areas were assessed as low, as the introduction of construction vehicles and vegetation clearance during construction, and the introduction of new transmission infrastructure during operation, would involve the addition of elements that may be prominent but not substantially uncharacteristic of the existing landscape.

Potential impacts on nature reserves were assessed as moderate, as new infrastructure would be inconsistent with the existing characteristics of these areas. However, impacts would be minimised through the use of drones to install the conductors across nature reserves and the use of poles instead of towers in some areas, which are less visually prominent. Existing roadside vegetation would also help to screen visual impacts in some areas.

Potential impacts on residences were assessed as moderate-low. The magnitude of these impacts would be relatively high as they would be felt in people's homes. However, for that reason, any design options considered early in the Proposal's development that would have had a significant impact on residences were rejected. As a result, impacts on residences have been able to be minimised and would not be significant.

Table 9.3 Landscape Character Assessment

Landscape Zone	Proposal Stage	Sensitivity	Magnitude	Impact
Semi-rural, light industrial	Construction	**Low** Viewers consist of regular users (e.g. workers) and the general community. Existing utility infrastructure would accommodate the addition of transmission lines without obvious or significant alteration to existing landscape character.	**Low** Construction of the Proposal would involve a minor addition of heavy and light vehicles into the landscape zone. The area around the Proposal is developing into a hub of utility infrastructure and an increase in construction traffic is therefore expected. Poles are also being used instead of towers to increase the height of conductors and minimise the need for vegetation clearance where woodland exists along the new alignments. Impacts from vegetation clearance would therefore be minimal across the landscape zone.	**Low**
	Operation		**Negligible** The addition of transmission lines to the landscape zone represents a minor addition of utility infrastructure to a landscape which already contains some industrial elements. The introduction of these elements is therefore consistent with the existing landscape.	
Nature reserve	Construction	**Moderate** Viewers consist of regular users, passers-by or tourists (such as bushwalkers). The addition of transmission lines to an otherwise natural landscapes would be noticeable to users in areas that do not already contain transmission lines (e.g. at Uriarra Crossing).	**Low** Drones will be used to carry the conductors between towers for stringing across sensitive areas, including nature reserves and the Murrumbidgee and Molonglo River corridors. For the removal of transmission lines, foundations will be left in situ in nature reserves to minimise disturbance. Four new towers would be constructed within nature reserve areas, on their boundaries.	**Moderate**
	Operation		**Moderate** Existing roadside vegetation would help to screen visual impacts in some areas, and poles will be used to minimise the need for vegetation trimming in woodland areas. The new alignments would be visible in some recreational areas such as Uriarra Crossing, but impacts cannot be mitigated at these locations (e.g. viewpoint 3; **Plate 9.1**).	

Landscape Zone	Proposal Stage	Sensitivity	Magnitude	Impact
Residential	Construction and operation	**High** Viewers consist of residents who would be viewing the Proposal from their home or primary place of residence, and while travelling to and from their homes on a regular basis.	**Moderate** The location of the new alignments was selected through an iterative design process over several years to ensure the Proposal infrastructure and construction activities would not be inconsistent with or overly prominent in the landscape. Impacted stakeholders were consulted throughout the design process, and designs with too severe of a visual impact were rejected. Construction of the Proposal would involve a minor and temporary addition of heavy and light vehicles into the landscape.	**Moderate-low**

9.4.2 Visual Amenity

9.4.2.1 Adverse Impacts

Potential adverse visual impacts of the Proposal at each viewpoint are summarised in **Table 9.4**. Of these, 22 viewpoints would have a LVIR of low, due to the transitory nature of views towards the new infrastructure or because they have views of existing infrastructure that would be removed (and would be subject to short-term, temporary impacts associated with demolition). These include the viewpoints at Shepherds Lookout (viewpoint 15; **Plate 9.2**) and Fairlight Station (viewpoint 21; **Plate 9.3**), and most of the viewpoints within Ginninderry (e.g. Pro Hart Avenue and Bob Whan Street; see viewpoint 20, **Plate 9.4**).

A total of 13 viewpoints have a LVIR of high and are considered to have a significant visual impact. These viewpoints are primarily located on Uriarra Road (e.g. viewpoint 3, **Plate 9.1**) and Stockdill Drive (e.g. viewpoint 16, **Plate 9.5**), with two high LVIR viewpoints located at Fairlight Road. New infrastructure is relatively close to these view locations and/or the viewpoints have a high sensitivity to change, such as the Uriarra Crossing recreational areas (viewpoint 3).

These impact ratings are based primarily on operational impacts, i.e. once the new alignments have been installed and the existing lines removed. Construction impacts would be temporary, and areas such as access tracks and laydown areas would be rehabilitated following completion of the Proposal, so there would be no long term or permanent impacts from construction. Viewpoints with a high LVIR and in close proximity to new infrastructure are likely to be the most impacted by both construction and operation. Residents of Ginninderry may experience adverse impacts relating to the removal of existing lines but the impacts would be confined to the construction stage.

As with landscape character impacts, potential cumulative visual impacts would mostly occur once the Proposal is operational. Cumulative visual impacts would be lower from viewpoints at which existing utility infrastructure is also visible, for example the Stockdill and Canberra Substations, other high voltage transmission lines and smaller powerlines (e.g. viewpoint 16; **Plate 9.5**), Territory Battery, and the LMWQCC, as the Proposal would blend in with this infrastructure. Cumulative visual impacts could occur during construction, if the Territory Battery and areas of Strathnairn and Macnamara are constructed concurrently to the Proposal. However, these impacts would be short-term and temporary.

Table 9.4 Visual Impact Assessment

ID	Viewpoint	Proximity to Proposal Infrastructure	Nature of Change to View	LVIR
VP1	Uriarra Road, northerly view	2,700 m	New transmission lines	Medium
VP2	Uriarra Road, eastern side of the Murrumbidgee River, north-westerly view	2,700 m	New transmission lines	Medium
VP2A	Uriarra Road, eastern side of the Murrumbidgee River, north-westerly view	1,400 m	New transmission lines	High
VP3	Uriarra Crossing East Picnic Area, north-westerly view	800 m	New transmission lines (conductors only)	High
VP4	Uriarra Road, westerly view	900 m	New transmission lines	High
VP5	Uriarra Crossing West Picnic Area, northerly view	350 m	New transmission lines (conductors only)	High
VP6	Uriarra Road, western side of the Murrumbidgee River, northerly view	1,700 m	New transmission lines	Medium
VP7	Fairlight Road, south-easterly view	400 m	Cutover from existing Lines 1 and 7 to the new alignments	High
VP8	Fairlight Road, north-easterly view	Adjacent	Lines being removed	Medium
VP9	Fairlight Road, easterly view	1,400–3,500 m	New transmission lines	Medium
VP10	Fairlight Road , south-westerly view	550 m	New transmission lines	High
VP11	Uriarra Road, eastern side of the Murrumbidgee River, easterly view	Adjacent–2200 m	New transmission lines	High
VP12	LMWQCC / Stockdill Drive , westerly view	450–4,000 m	New transmission lines	High
VP12A	LMWQCC / Stockdill Drive, south-westerly view	450 m	New transmission lines	High
VP12B	LMWQCC / Stockdill Drive, easterly view	Adjacent	New transmission lines	High
VP13	Stockdill Drive adjacent to new alignment, easterly view	Adjacent	New transmission lines	High
VP14	Stockdill Drive adjacent to new alignment, north-easterly view	Adjacent	New transmission lines	High
VP15	Shepherds Lookout, north-westerly view	850–2,550 m	Lines being removed	Low
VP15A	Shepherds Lookout, northerly view	2,300 m	Lines being removed	Low
VP15B	Shepherds Lookout, north-westerly view	2,300 m	Lines being removed	Low

ID	Viewpoint	Proximity to Proposal Infrastructure	Nature of Change to View	LVIR
VP15C	Shepherds Lookout, westerly view	1,900–4,200 m	New transmission lines	Medium
VP15D	Shepherds Lookout, southerly view	1,600 m	New transmission lines	Medium
VP16	Stockdill Drive, south-easterly view	Adjacent	New transmission lines and connection at the Stockdill Substation	High
VP17	Stockdill Drive, northerly view	Adjacent	Lines being removed	Low
VP18	Stockdill Drive, north-easterly view	700 m	New conductor on Line 3C (subject to separate approvals)	Low
VP19	Pro Hart Avenue, northerly view	Adjacent	New conductor on Line 3C (subject to separate approvals)	Low
VP19A	Pro Hart Avenue, easterly view	Adjacent	New conductor on Line 3C (subject to separate approvals)	Low
VP20	Bob Whan Street, south-easterly view	Adjacent	Lines being removed	Low
VP21	Fairlight Residence southern side, south-westerly view	1,000 m	New transmission lines	Medium
VP21B	Fairlight Residence southern side, south-easterly view	2,600 m	Lines being removed	Low
VP21C	Fairlight Residence southern side, easterly view	2,700 m	Lines being removed	Low
VP22	Fairlight Residence northern side, easterly view	1,100 m	Lines being removed	Low
VP22A	Fairlight Residence northern side, north-easterly view	760 m	Lines being removed	Low
VP22B	Fairlight Residence northern side, north-westerly view	820 m	Lines being removed	Low
VP22C	Fairlight Residence northern side, westerly view	2,000 m	Lines being removed	Low
VP23	Macnamara, westerly view	Adjacent	Lines being removed	Low
VP23A	Macnamara, easterly view	Adjacent	Lines being removed	Low
VP24	Macnamara, westerly view	Adjacent	Lines being removed	Low
VP24A	Macnamara, easterly view	Adjacent	Lines being removed	Low
VP25	Macnamara, south-westerly view	Adjacent	Lines being removed	Low
VP25A	Macnamara, northerly view	Adjacent	Lines being removed	Low
VP26	Mountain Creek Road rural residential area, north-easterly view	Distant	New transmission lines and lines being removed	Low

Plate 9.1 Views from viewpoint 3, Uriarra Crossing East Picnic Area (high LVIR), (a) before and (b) after the Proposal – the new conductors would be visible, but impacts are unable to be avoided or mitigated due to the position of the conductors over the river (dsb Landscape Architects, 2024)

Plate 9.2 Views from viewpoint 15, Shepherds Lookout (low LVIR), (a) before and (b) after the Proposal – adverse visual impacts would be minimal (related to demolition), with a net beneficial impact due to removal of the existing lines (dsb Landscape Architects, 2024)

Plate 9.3 Views from viewpoint 21, Fairlight Station (medium LVIR), (a) before and (b) after the Proposal – the new alignments would be visible but not prominent (dsb Landscape Architects, 2024)

Plate 9.4 Views from viewpoint 20, Bob Whan Street, Strathnairn (low LVIR), (a) before and (b) after the Proposal – removal of the existing lines would greatly improve local visual amenity for Ginninderry residents (dsb Landscape Architects, 2024)

Plate 9.5 Views from viewpoint 16, Stockdill Substation (high LVIR), (a) before and (b) after the Proposal – the new alignments would be less visually prominent in areas with existing infrastructure (dsb Landscape Architects, 2024)

9.4.2.2 Beneficial Impacts

The removal of existing lines as part of the Proposal will improve local amenity by reducing visual impacts on residential areas, including the areas being unlocked for housing by moving the lines. Further beneficial impacts include the net removal of infrastructure from within the GCC and from other nature reserves such as the Woodstock Nature Reserve. This would allow for improved conservation outcomes in these areas.

Residences within the Proposal Area are scattered, with Fairlight Station located in the centre and other rural residences located along Fairlight Road and Mountain Creek Road to the west (see **Figure 9.1**). Huntly Station is located to the south on Uriarra Road. Viewpoint 21 from the Fairlight residence is classified as medium LVIR (see **Plate 9.3**). The remaining viewpoints from the Fairlight residence are classified as low LVIR. The LVIRs for viewpoints within the Ginninderry urban development are all categorised as low (e.g. viewpoint 20; **Plate 9.4**), as are impacts on the Mountain Creek Road rural residential area.

The visual comparison of viewpoints in the LVIA report (**Appendix G5**) demonstrates that residences that would be impacted by line removal will have a net beneficial impact, with improved visual amenity. South-westerly views from the Fairlight residence would be the only residential viewpoint adversely impacted by new infrastructure. As illustrated in **Plate 9.3**, the distance from viewpoint 21 to the new infrastructure is approximately 1 km and views of the new infrastructure would be distant but encapsulate both towers and conductors.

9.5 Avoidance, Mitigation and Management Measures

The viewpoints identified as having a high visual impact from the Proposal are areas of key consideration for avoidance and mitigation. In the LVIA report (**Appendix G5**), dsb Landscape Architects identified viewpoints where vegetation could be planted to screen impacts of the new alignments at those locations. However, at all these locations, the screening would also adversely impact rural and riverine views across the landscape (e.g. viewpoint 10, **Plate 9.6** and viewpoint 12, **Plate 9.7**). The GJV is therefore not proposing to plant new vegetation screening as it is considered more important to retain views across the landscape than to screen views of the new transmission lines, particularly since the landscape contains existing transmission lines and the Proposal is not introducing a new visual element into the landscape.

Conversely, where high LVIRs occur along Stockdill Drive (viewpoints 13, 14 and 16), poles are being used instead of towers to increase the height of the conductors and minimise the need for vegetation clearance. As shown in **Plate 9.6**, this has resulted in a reduced LVIR at these viewpoints, from high to medium.

The Proposal has undergone substantial design iterations over the past several years to minimise visual impacts where practicable. As discussed in **Section 2.4**, several route options for the new alignments were initially considered, most of which were ruled out following consultation with relevant landholders, in part due to visual amenity concerns. The final Proposal design (as assessed in this EIS) was identified by these stakeholders as suitable for further consideration, demonstrating the effectiveness of the GJV's avoidance efforts. The Proposal is also located near other existing utility infrastructure (including the Stockdill and Canberra Substations, LMWQCC and proposed Territory Battery) to consolidate potential visual impacts and minimise impacts on landscape character across rural areas.

Plate 9.6 Views from viewpoint 10, Fairlight Road (medium LVIR), (a) before and (b) after the Proposal – the new alignments would be visible and could be screened by trees planted on the northern (left) side of the road, however this would diminish landscape views (dsb Landscape Architects, 2024)

Plate 9.7 Views from viewpoint 12, LMWQCC (high LVIR), (a) before and (b) after the Proposal – the new alignments would be visible and could be screened by trees planted on the western (left) side of the road, however this would diminish landscape views (dsb Landscape Architects, 2024)

Impacts will be further mitigated during construction through an industry best practice CEMP. The Proposal involves the relocation of Lines 1 and 7 (i.e. replacement of existing infrastructure with new infrastructure), which will avoid the accumulation of transmission lines in the landscape. Visual barriers such as fences will be used to minimise impacts associated with vehicle movements throughout the area and vegetation clearance / soil exposure. Site access tracks and laydown areas will be demarcated on site and construction vehicles will be restricted to these areas, mitigating the risk of broadscale impacts during construction. Lighting during construction will be limited to any periods of poor ambient light when safe work conditions require artificial lighting. Lighting would be directed towards the construction footprint and away from sensitive receptors.

Given the detailed design work that has been undertaken for the Proposal to date, impacts on landscape character and visual amenity have been minimised and there is therefore minimal scope for further mitigation measures. This is demonstrated in the residual risk assessment in **Section 9.6**, which shows that the preliminary and residual risk ratings for landscape and visual impacts are all ALARP.

Table 9.5 Mitigation Measures for Viewpoints with a High Unmitigated LVIR

Viewpoint	Impacted Landscape Feature	Mitigation Measure	Residual LVIR
VP2A	Murrumbidgee River crossing	Screening not reasonably practical as it would further diminish views of rural and riverine landscapes.	High
VP3		No potential mitigation measures.	High
VP4		Screening not reasonably practical as it would further diminish views of rural and riverine landscapes.	High
VP5		No potential mitigation measures.	High
VP10		Screening not reasonably practical as it would further diminish views of rural and riverine landscapes.	High
VP7	Cutover from existing Lines 1 and 7 to the new alignments	Screening not reasonably practical as it would further diminish views of rural landscapes.	High
VP11	Molonglo River crossing	Screening not reasonably practical as it would further diminish views of rural and riverine landscapes.	High
VP12			High
VP12A			High
VP12B			High
VP13	Stockdill Drive	Existing roadside vegetation screens mitigate the visual impact of the transmission lines. Poles will be used to minimise the need for vegetation clearance.	Medium
VP14			Medium
VP16			Medium

9.6 Residual Risk Assessment

The residual risk assessment in **Table 9.6** provides revised risk ratings with consideration of the additional mitigation measures discussed in **Section 9.5**. The residual risk ratings are mostly unchanged from the preliminary risk ratings, as the LVIA was based on a Proposal design that has been developed over several years to avoid and minimise visual impacts wherever practicable.

The residual risk ratings range from very low to high and are all ALARP, although the unmitigated risk ratings were already ALARP due to the substantial avoidance work the GJV has undertaken over the past few years. Significant residual risks remain due to the unavoidable visual impacts associated with introducing new transmission line infrastructure into the landscape, which cannot be further mitigated.

Table 9.6 Residual Assessment of Risks Associated with Landscape Character and Visual Amenity

ID	Risk Scenario	Preliminary risk assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Design								
L1	The location of the Proposal results in a loss of visual amenity for local residents and users of the surrounding area and impacts on landscape character.	Medium	Yes	• The location of the new alignments was selected through an iterative design process over several years to ensure the proposed infrastructure and construction activities would not be inconsistent with or overly prominent in the landscape. Impacted landholders were consulted throughout the design process, and designs with too severe of a visual impact were rejected. These stakeholders found that the final Proposal design (assessed in this EIS) was acceptable for further consideration, demonstrating the effectiveness of the GJV's avoidance efforts.	Possible	Moderate	Medium	Yes

ID	Risk Scenario	Preliminary risk assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
L2	Cumulative visual impacts occur as a result of the Proposal and other developments in the region.	Medium	Yes	• Refer to avoidance measures described for L1. • As a considerable portion of the Proposal Area contains existing utility infrastructure (e.g. the Stockdill and Canberra Substations, other high voltage transmission lines and smaller powerlines, the LMWQCC, and the proposed Territory Battery), the Proposal would not result in the addition of new elements into the landscape, thereby minimising potential cumulative impacts.	Possible	Moderate	Medium	Yes
Construction								
L3	Vegetation clearance results in a loss of visual amenity for local residents and impacts on landscape character.	Very low	Yes	• Industry best practice CEMP will be implemented which includes measures to mitigate visual impacts associated with vegetation clearance, including the installation of fences or barriers and rehabilitation of construction areas as soon as possible. Approved disturbance areas will be demarcated on site, to ensure that vegetation clearance and vehicle movements do not occur in areas not approved for these activities.	Unlikely	Minor	Very low	Yes

ID	Risk Scenario	Preliminary risk assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				• Poles will be used to minimise the need for vegetation clearance in sensitive ecological areas along Stockdill Drive, as they allow for greater separation between conductors and vegetation.				
L4	Construction of the Proposal results in a loss of visual amenity for local residents and users of the surrounding area and impacts on landscape character.	Low	Yes	• Refer to mitigation measures listed for L3. Additionally, existing roadside vegetation will mitigate the visual impact of the new alignments at some viewpoints, particularly along Stockdill Drive. • The use of on-site lighting during construction will be limited to times when staff are on site and there is insufficient natural light for maintaining safe working conditions. Lighting during Proposal operation will be limited to times when maintenance work is being undertaken on site. • On-site lighting will be directed towards the Proposal Area and away from sensitive receptors.	Possible	Minor	Low	Yes
L5	Cumulative visual impacts occur as a result of Proposal construction and other developments in the region.	Medium	Yes	• Refer to mitigation measures listed for L3 and L4.	Possible	Moderate	Medium	Yes

ID	Risk Scenario	Preliminary risk assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Operation								
L6	Once operational, the Proposal results in a loss of visual amenity for local residents and users of the surrounding area and impacts on landscape character.	High	Yes	• The location of the new alignments was selected through an iterative design process over several years to ensure the Proposal infrastructure would not be inconsistent with or overly prominent in the landscape. Impacted landholders were consulted throughout the design process, and designs with too severe of a visual impact were rejected. stakeholders found that the final Proposal design (assessed in this EIS) was acceptable for further consideration, demonstrating the effectiveness of the GJV's avoidance efforts. • Additionally, the Proposal involves the relocation of Lines 1 and 7 (i.e. replacement of existing infrastructure with new infrastructure), which will avoid the accumulation of transmission lines in the landscape. • No additional mitigation such as vegetation screening is proposed, as this would have adverse impacts on views of the surrounding rural and riverine landscapes which are considered to outweigh benefits from screening views of the new alignments.	Likely	Moderate	High	Yes

ID	Risk Scenario	Preliminary risk assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
L7	Cumulative visual impacts occur as a result of operation of the Proposal and other developments in the region.	Medium	Yes	• Refer to avoidance measures described for L6. • As a considerable portion of the Proposal Area contains existing utility infrastructure (e.g. the Stockdill and Canberra Substations, other high voltage transmission lines and smaller powerlines, the LMWQCC, and the proposed Territory Battery), the Proposal would not result in the addition of new elements into the landscape, thereby minimising potential cumulative impacts. • Further, the removal of existing lines as part of the Proposal will improve local amenity by reducing visual impacts on residential areas.	Possible	Moderate	Medium	Yes

10.0 Noise and Vibration

Chapter Summary
This chapter provides an assessment of potential impacts associated with noise and vibration from the Proposal, including impacts on both people and property.

10.1 Preliminary Risk Assessment

An assessment of Proposal risks associated with noise and vibration is provided in **Table 10.1**. The risk ratings range from very low to high, with significant noise and vibration impacts possible during construction if not appropriately mitigated and managed.

Section 10.2 to **Section 10.4** provide a detailed assessment of these risks. The residual risk assessment in **Section 10.6** provides revised ratings for each risk based on the mitigation and management measures described in **Section 10.5**.

Table 10.1 Preliminary Assessment of Risks Associated with Noise and Vibration

ID	Risk Scenario	Preliminary Risk Assessment			
		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Construction					
N1	Proposal construction activities lead to an increase in noise levels in the surrounding area which reduces local amenity, potentially impacting nearby people and resulting in community complaints and/or non-compliance with the EP Act.	Likely	Moderate	High	No
N2	Proposal construction activities lead to off-site vibration which reduces local amenity, potentially impacting nearby people and resulting in damage to nearby structures.	Possible	Moderate	Medium	No
N3	Cumulative noise and vibration impacts occur as a result of Proposal construction and other developments in the region.	Likely	Moderate	High	No
Operation					
N4	Once operational, noise from the Proposal (caused by corona discharge) reduces local amenity, potentially impacting nearby people and resulting in community complaints and/or non-compliance with the EP Act.	Possible	Minor	Low	No
N5	Cumulative noise impacts occur as a result of operation of the Proposal and other developments in the region.	Possible	Minor	Low	No

10.2 Investigations

A Noise and Vibration Impact Assessment (NVIA) was undertaken by Umwelt to assess potential noise and vibration impacts of the Proposal (see **Appendix G6**). The assessment methodologies adopted for the two impact assessments are described below.

10.2.1 Noise Impact Assessment

The noise impact assessment was undertaken in two parts to assess noise associated with construction and operation of the Proposal. In the ACT, both construction noise and operational noise are governed by the same noise regulations and guidelines, as described in **Table 10.2**.

Table 10.2 Information Sources Used for the Noise Impact Assessment

Document	Relevance to the noise impact assessment
Environment Protection Regulation 2005 (EPR)	The EPR sets out provisions for the protection of the environment from noise emissions, including the specification of noise zones and standards. **Table 10.3** of this EIS identifies the relevant noise zones and standards for the Proposal. The EPR provides exemptions (with conditions) for construction noise.
Noise Environment Protection Policy (Noise EPP)	The Noise EPP provides information about noise requirements of the EP Act and EPR in relation to business activities (including government and commercial, industrial and construction sectors), and people's activities in and around the home. Under the EPR, the ACT is divided into noise zones based on the land use policies defined by the Territory Plan. An activity is considered to cause environmental harm under the EPR if its noise levels exceed the noise standards specified for the relevant noise zone.
Environment Protection (Noise Measurement Manual) Approval 2009 (No 1) (NMM)	The NMM is a disallowable instrument made under the EPR. It outlines how to measure environmental noise to determine compliance with the EP Act, EPR and other associated legislative instruments. Inputs to the Proposal's noise modelling were modified in accordance with the modifying factor corrections provided in the NMM, e.g. for tonal noise.
***Territory Plan 2008* (Territory Plan)**	The Territory Plan stipulates the type of development that is permissible on each parcel of land in the ACT through the use of land use zones. These zones are used in conjunction with the noise zones specified in the EPR to identify the noise standard for a particular block of land which a development must comply with (see **Table 10.3**).
Noise Management Guidelines (NMG) (TCCS, 2018)	The NMG provides road traffic noise guidelines for assessing potential impacts of traffic noise from new developments on land uses sensitive to noise intrusion. The NMG was used to assess potential traffic-related noise impacts of the Proposal.
NSW Road Noise Policy (RNP) (DECCW NSW, 2011)	The RNP outlines a range of measures for minimising road traffic noise and its impacts from existing roads, new road projects, road redevelopment projects and new traffic-generated developments. It also defines criteria to be used for assessing the impact of traffic noise. The RNP was used in conjunction with the NMG to assess potential traffic-related noise impacts of the Proposal.

The EPR provides a framework for setting noise criteria for different types of activities and developments. Schedule 2 provides information regarding noise zones, noise standards and conditions. Noise zones are identified based on the location of a particular land parcel and/or its zoning, for example if it is located in the city centre or in an industrial zone. Each noise zone has a day-time and/or night-time noise standard in units of dB L_{A10}, which a development must comply with. The noise zones and standards applicable to the Proposal are outlined in **Table 10.3**. As the Proposal is located adjacent to the ACT/NSW border, impacts on receivers in NSW have also been considered.

The noise standards are in units of dB L_{A10}, which is the noise level exceeded for 10% of a measurement time period with an A frequency weighting applied (which scales the sound levels in an attempt to replicate the sensitivity of the human ear to different frequencies of sound across the full frequency range).

Table 10.3 Noise Zones and Standards Applicable to the Proposal (excerpts from Table 2.1 and Table 2.2 of the EPR)

Noise zone	ACT land description	NSW land description	Noise standard (dB L_{A10})	
			Monday to Saturday: 7 am to 10 pm Sunday and public holidays: 8 am to 10 pm	All other times
Zone E	Land (other than land in the city centre, town centres and group centres) in— • A restricted access recreation zone. • A broadacre zone.	-	50	40
Zone F	Land (other than land in the city centre, town centres and group centres) in— • A commercial CZ5 zone. • A TSZ2 services zone. • A community facility zone. • A leisure and accommodation zone.	Land in the Queanbeyan city special uses zone	Same as the noise standard for the adjoining noise zone with the loudest noise standard for the time period	
Zone G	All other land, other than land in the Central National Area (Fairbairn)	All other NSW land	45	35

10.2.1.1 Construction

The noise standards identified in **Table 10.3** apply to both operational noise and construction noise. However, in accordance with Division 3.2, Section 29 of the EPR, exemptions for construction noise apply if certain conditions can be met by a development.

Table 2.3 of the EPR lists the various noise exemptions available to developments in the ACT. Item 21 is applicable to the Proposal, as it relates to noise emitted in the course of development. The exemption conditions for item 21 are replicated in **Table 10.4** along with their applicability to the Proposal. If the conditions are met when carrying out the relevant activities, the associated noise is exempt from meeting the noise standards. If the conditions are not met, the noise standards outlined in **Table 10.3** must be complied with. The Proposal is expected to meet all of the conditions of item 21 so would be exempt from meeting the noise standards in **Table 10.3** during construction.

Table 10.4 Noise Exemptions (excerpt from Table 2.3 of the EPR)

Condition	Relevance to the Proposal
e. All of the following: • The noise is emitted from a place other than a place in noise zone A or B	Applicable – the Proposal is not located in noise zone A or B.
• the building work or development will not be finished within 2 weeks after the day it started	Applicable – the Proposal would be constructed over a period of around 18 months.
• all relevant noise reduction measures mentioned in AS 2436, as in force from time to time, are implemented	Applicable – all relevant noise reduction measures mentioned in *AS 2436 Guide to noise control on construction, maintenance and demolition sites*, as in force during Proposal construction, will be implemented.
• the noise is emitted between 7 am and 6 pm on Monday to Saturday, excluding public holidays.	Applicable – Standard construction hours for the Proposal would be 7 am to 6 pm (Monday to Friday) and 7 am to 1 pm (Saturday). Ad hoc out-of-hours work may be required at times, e.g. due to poor weather or to avoid disturbance to a particular landholding or event. Low-noise activities would be undertaken during out-of-hours when possible. If not possible, noise would be managed to comply with the noise standards shown in **Table 10.3**.

Where a noise source contains certain characteristics such as tonality, impulsiveness, intermittency, irregularity or dominant low-frequency content, modifying factor corrections are applied to account for the greater annoyance that the sources may cause. The NMM prescribes specific modifying factors that should be considered in the assessment of the relevant noise events. A modifying factor was applied to Proposal construction activities which involve the use of an excavator with a hydraulic hammer (construction of new tower footings and demolition of existing towers), to increase the sound power to account for the impulsiveness of the noise source.

10.2.1.2 Construction Traffic

In the ACT, the NMG sets out a framework for assessing the impact of road traffic noise for land uses sensitive to noise. It provides road traffic noise planning guideline levels for new developments based on the land / building usage.

Egis undertook a Traffic Impact Assessment (TIA) to identify potential traffic-related impacts of the Proposal during construction and demolition. The TIA (**Appendix G7**) specifies that Pro Hart Avenue, Stockdill Drive, Parkwood Road, Uriarra Road, and Fairlight Road are the major roads that would be directly impacted by the Proposal's construction and demolition traffic. Traffic levels on these roads were provided in the TIA and were used to inform the noise impact assessment.

Guidance within the NSW RNP was used to undertake a screening assessment to determine potential road noise impacts. The EPA publication *Applying the NSW Road Noise Policy* (NSW EPA, n.d.) states:

> *"…for existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level as a result of the development should be limited to 2 dB above that of the noise level without the development. This limit applies wherever the noise level without the development is within 2 dB of, or exceeds, the relevant day or night noise assessment criterion."*

In assessing noise impact, an increase of up to 2 dB represents a minor impact that is considered barely perceptible to the average person.

10.2.1.3 Operation

Noise from operational overhead powerlines, such as hissing or crackling, can result from an effect called corona discharge, or corona effect. The intensity of the corona effect and the resulting noise is dependent on meteorological conditions such as humidity, rain, fog, wind, the concentration of airborne particles such as dust or ash and the state of the conductor surface. Corona effects are more pronounced in humid or rainy conditions, as water droplets increase the conductivity of the air and lower the breakdown voltage.

Corona effects are relatively small in fair weather but can become evident during light rainfall and humid conditions as a consequence of water droplets mixing with dust on the conductor. Corona effects can also become substantial under electrically-charged storm clouds.

The BoM's statistical data from 2008 to 2023 indicate that on average, the Canberra Airport has approximately 71 rain days per year (days with recorded rain of over 1 mm) (BoM, 2024). While corona discharge may occur on these days, representing nearly 20% of the time, it is likely that the noise is masked by the rain itself for some of the time it is raining.

The BOM's statistical data for the Canberra Airport (1976 to 2005) indicate that relative humidity is highest at 9 am during June and July, averaging approximately 90% (BoM, 2024). Humid/foggy early morning conditions in winter months are therefore the most likely time for corona noise in the Proposal Area.

The noise impact assessment included an assessment of potential noise impacts from corona effects during operation of the new alignments. Stability class D and calm conditions were used for non-enhancing conditions in the operational noise assessment, while stability class F and 2 m/s source to receiver meteorology conditions were adopted as enhancing conditions.

An indicative sound power level of 83 dB(A) was adopted for corona discharge. In terms of noise modelling, corona discharge is considered a point source. It is understood that corona effects largely occur around cable joins, but can also occur along the length of the conductors. For the purpose of this operational noise assessment, the corona sound power was modelled as a point source at tower heights of 30 m along the extent of the new alignments for simplicity.

10.2.2 Vibration Impact Assessment

Some of the Proposal construction activities would require the use of vibration-generating equipment such as vibratory rollers and hydraulic hammers. This equipment has the potential to impact nearby receivers through ground-borne vibrations, potentially causing cosmetic building damage, structural damage, or reduced amenity. Vibration impacts would depend on many factors such as:

- Size and power rating of the vibration-generating equipment.
- Types of activity and how the equipment is used.
- Distance between the source of vibration and a receiver.
- Geology of the soil/rock through which the vibration is transmitted.

The types of vibration-sensitive receivers in the surrounding area include residential buildings and commercial/agricultural buildings. Any commercial/agricultural buildings in the area are assumed to be structurally similar to residential buildings, therefore the assessment for residential buildings is considered to be relevant for commercial/agricultural buildings as well.

The ACT does not have guidelines for assessing potential vibration impacts on people or buildings. The vibration impact assessment for the Proposal was therefore undertaken with consideration of the Transport for NSW (2023) Construction Noise and Vibration Guideline (CNVG). Vibration impacts were only considered in relation to Proposal construction, as there would be no sources of vibration once the transmission lines are operational.

Table 10.5 provides safe working distances for preventing vibration damage to residences and for maintaining human comfort, based on Table 2 of the CNVG. As the equipment to be used during Proposal construction will be selected during detailed design, a range of ratings have been provided to inform equipment selection in the event that vibration poses a risk to structures or people. It should be noted that these values are indicative as vibration levels are dependent on local geology and may vary from source to source.

Table 10.5 Recommended Minimum Working Distances Between Vibration Generating Plant and Residential Receivers (from the CNVG)

Plant Item	Rating/Description	Minimum Working Distance[1,2]	
		Cosmetic Damage	Human Response
Vibratory roller	<50 kilonewtons (kN) (typically 1–2 tonnes (t))	5 m	15 m to 20 m
	<100 kN (typically 2–4 t)	6 m	20 m
	<200 kN (typically 4–6 t)	12 m	40 m
	<300 kN (typically 7–13 t)	15 m	100 m
	>300 kN (typically 13–18 t)	20 m	100 m
	>300 kN (> 18 t)	25 m	100 m
Small hydraulic hammer	300 kg (mounted on a 5–12 t excavator)	2 m	7 m
Medium hydraulic hammer	900 kg (mounted on a 12–18 t excavator)	7 m	23 m
Large hydraulic hammer	1600 kg (mounted on a 18–34 t excavator)	22 m	73 m
Vibratory pile driver	Sheet piles	2 m to 20 m	20 m
Pile boring	≤800 mm	2 m (nominal)	4 m
Jackhammer	Handheld	1 m (nominal)	2 m

[1] *Larger minimum working distances are required for alternative equipment with higher vibration levels.*

[2] *More stringent conditions may apply to heritage listed structures or other sensitive structures.*

10.3 Sensitive Receivers

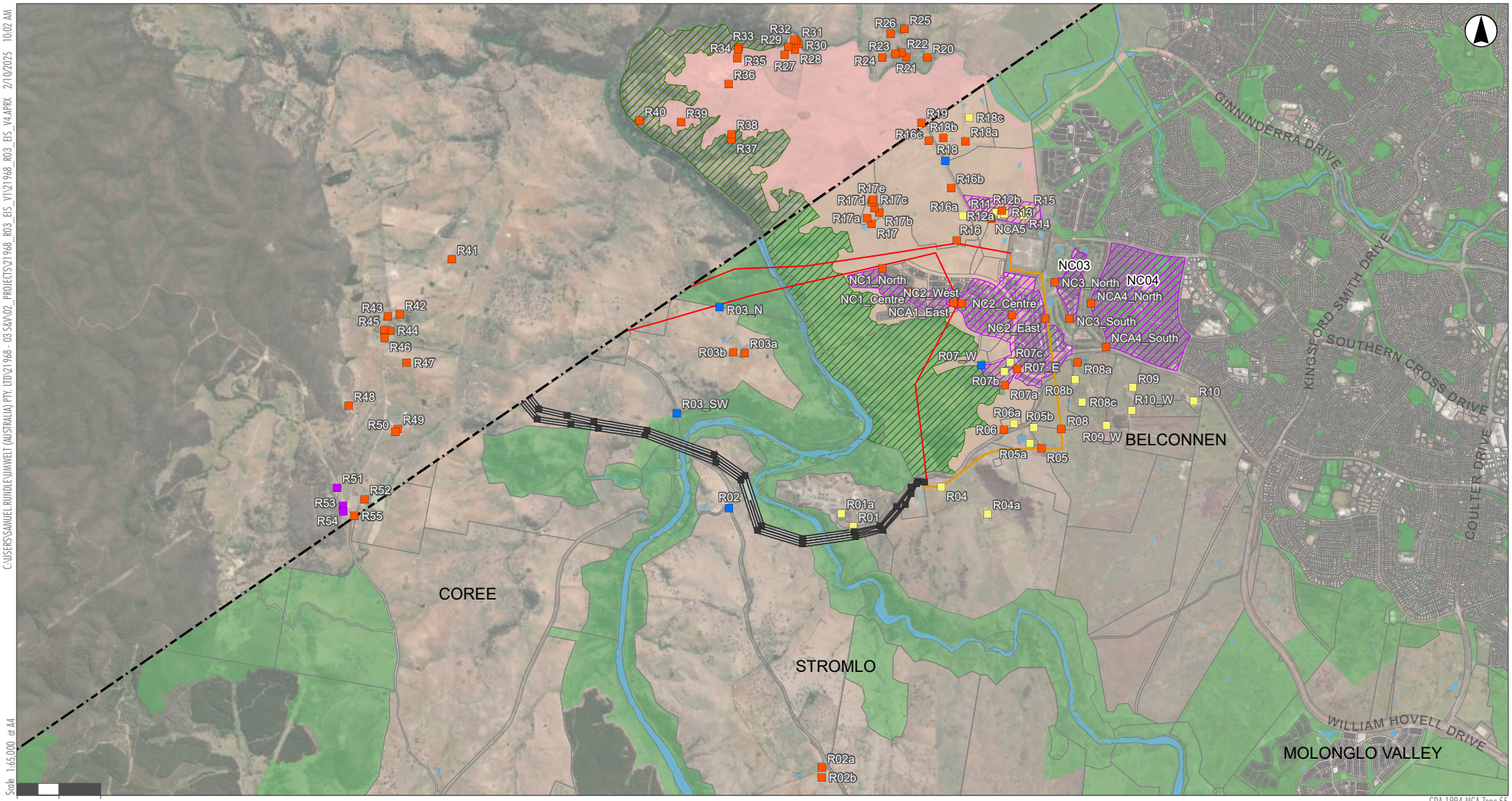
The Proposal Area is on the north-western border between the ACT and NSW which means that there are noise and vibration sensitive receivers located in both the ACT and NSW (see **Figure 10.1**). Within the ACT, the receivers are typically either rural residential (located on properties outside of the suburban area) or urban residential (located within the Ginninderry suburbs), with 38 classified as residential and 22 classified as commercial (e.g. the LMWQCC). The NSW receivers are representative of the reasonably most-affected point within 30 m of a residence. 34 of the NSW receivers are residential, and 3 are sheds.

To simplify the presentation of results from the noise impact assessment, some isolated receivers near the Proposal Area have been assessed as individual receiver points while groups of receivers further from noise sources have been grouped into noise catchment areas (NCAs). NCAs allow for the logical grouping of receivers which would be similarly affected by noise from a development to assist with assessment and possible future consultation. The receivers and NCAs near the Proposal are shown on **Figure 10.1**. The full list of receivers is provided in **Table 10.6**.

It should be noted that the EPR requires that noise impacts be assessed at the boundary of a property, not at specific locations where people are more likely to be present, such as at residences or offices on industrial sites. The noise impact assessment investigated noise impacts at both compliance locations (i.e. property boundaries) and noise receivers (e.g. residences), as modelling noise levels at the noise-sensitive locations helps to understand the impacts that people are more likely to experience.

Multiple assessment points for some receivers have also been included in the assessment for some receivers or NCAs, as different property boundaries would be affected by construction or operational noise sources more than others. Where more than one receiver or compliance location is present in the same property, postscript letters have been used in the receiver ID (e.g. R04 is for the boundary of Block 1634 and R04a is for the dwelling on the block).

Potential vibration impacts were assessed at all noise sensitive receivers.



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Scale: 1:65,000 at A4

Legend

- Transmission Lines to be Removed
- Line 3C Alignment – subject to separate approvals
- Proposed Alignment
- Noise Catchments
- Property Boundaries
- ACT/NSW Border
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development

Receivers

- Commercial
- Residential
- Road
- Shed

FIGURE 10.1

Noise Sensitive Receivers

Image Source: Nearmap (2022) Data source: ACT Government (2021)

Table 10.6 Sensitive Receivers Near the Proposal Area

Receiver ID	Type of receiver	Jurisdiction	Approx. distance from Proposal Area (m)	Block number	ACT land use zone	Noise zone
R01_BoundaryS	EPR compliance point (block boundary)	ACT	33	Block 1553 Belconnen	NUZ4 River Corridor	G
R01a	Commercial building	ACT	206	Block 1553 Belconnen	NUZ4 River Corridor	G
R02_BoundaryN	EPR compliance point	ACT	213	Block 413 Stromlo	NUZ2 Rural; NUZ4 River Corridor	G
R02a	Residential building	ACT	2,654	Block 413 Stromlo	NUZ2 Rural; NUZ4 River Corridor	G
R02b	Residential building	ACT	2,770	Block 413 Stromlo	NUZ2 Rural; NUZ4 River Corridor	G
R03_BoundaryN	EPR compliance point	ACT	35	Block 72 Coree	NUZ2 Rural; NUZ4 River Corridor	G
R03_BoundarySW	EPR compliance point	ACT	283	Block 72 Coree	NUZ2 Rural; NUZ4 River Corridor	G
R03a	Residential building	ACT	646	Block Coree	NUZ2 Rural; NUZ4 River Corridor	G
R03b	Residential building	ACT	578	Block Coree	NUZ2 Rural; NUZ4 River Corridor	G
R04_BoundaryN	EPR compliance point	ACT	163	Block 1634 Belconnen	NUZ3 Hills, Ridges and Buffer Areas	G
R04a	Commercial building	ACT	806	Block 1634 Belconnen	NUZ3 Hills, Ridges and Buffer Areas	G
R05_BoundarySE	EPR compliance point	ACT	1,408	Block 1582 Belconnen	NUZ1 Broadacre	E
R05a	Commercial building	ACT	1,296	Block 1582 Belconnen	NUZ1 Broadacre	E
R05b	Commercial building	ACT	1,336	Block 1582 Belconnen	NUZ1 Broadacre	E
R06_BoundarySW	EPR compliance point	ACT	977	Block 1420 Belconnen	RZ1 Suburban	G
R06a	Commercial building	ACT	1,098	Block 1420 Belconnen	RZ1 Suburban	G
R07_BoundaryE	EPR compliance point	ACT	974	Block 2 Section 35 Strathnairn	PRZ1 Urban Open Space, CF Community Facilities	F
R07_Boundary_W	EPR compliance point	ACT	577	Block 2 Section 35 Strathnairn	PRZ1 Urban Open Space, CF Community Facilities	F
R07a	Residential building	ACT	943	Block 2 Section 35 Strathnairn	PRZ1 Urban Open Space, CF Community Facilities	F
R07b	Commercial building	ACT	851	Block 2 Section 35 Strathnairn	PRZ1 Urban Open Space, CF Community Facilities	F

Receiver ID	Type of receiver	Jurisdiction	Approx. distance from Proposal Area (m)	Block number	ACT land use zone	Noise zone
R07c	Commercial building	ACT	870	Block 2 Section 35 Strathnairn	PRZ1 Urban Open Space, CF Community Facilities	F
R08_BoundaryW	EPR compliance point	ACT	1,664	Block 1600 Belconnen	NUZ3 Hills, Ridges and Buffer Areas	G
R08a	Residential building	ACT	1,516	Block 1600 Belconnen	NUZ3 Hills, Ridges and Buffer Areas	G
R08b	Commercial building	ACT	1,656	Block 1600 Belconnen	NUZ3 Hills, Ridges and Buffer Areas	G
R08c	Commercial building	ACT	1,849	Block 1600 Belconnen	NUZ3 Hills, Ridges and Buffer Areas	G
R09_BoundaryW	EPR compliance point	ACT	2,207	Block 1599 Belconnen	NUZ1 Broadacre	E
R09	Commercial building	ACT	2,160	Block 1599 Belconnen	NUZ1 Broadacre	E
R10_BoundaryW	EPR compliance point	ACT	2,801	Block 1598 Belconnen	NUZ1 Broadacre	E
R10	Commercial building	ACT	2,362	Block 1339 Belconnen	NUZ1 Broadacre	E
R11	Commercial building	ACT	426	Block 856 Belconnen	CZ5 Mixed Use	F
R12a	Commercial building	ACT	429	Block 858 Belconnen	CZ5 Mixed Use	F
R12b	Residential building	ACT	475	Block 858 Belconnen	CZ5 Mixed Use	F
R13	Commercial building	ACT	450	Block 859 Belconnen	CZ5 Mixed Use	F
R14	Commercial building	ACT	454	Block 1333 Belconnen	CF Community Facilities, CZ5 Mixed use	F
R15	Commercial building	ACT	547	Block 1440 Belconnen	CF Community Facilities	F
R16_Boundary	EPR compliance point	ACT	10	Block 1586 Belconnen	NUZ3 Hills, Ridges and Buffer Areas	G
R16a	Commercial building	ACT	317	Block 1586 Belconnen	NUZ3 Hills, Ridges and Buffer Areas	G
R16b	Residential building	ACT	643	Block 1586 Belconnen	NUZ3 Hills, Ridges and Buffer Areas	G
R16c	Residential building	ACT	1,251	Block 1586 Belconnen	NUZ3 Hills, Ridges and Buffer Areas	G
R17_Boundary	EPR compliance point	ACT	365	Block 1 Section 2 Macnamara	CF Community Facilities; NUZ3 Hills, Ridges and Buffer Areas; RZ1 Suburban	G
R17a	Residential building	ACT	453	Block 1 Section 2 Macnamara	CF Community Facilities; NUZ3 Hills, Ridges and Buffer Areas; RZ1 Suburban	G
R17b	Residential building	ACT	489	Block 1 Section 2 Macnamara	CF Community Facilities; NUZ3 Hills, Ridges and Buffer Areas; RZ1 Suburban	G

Receiver ID	Type of receiver	Jurisdiction	Approx. distance from Proposal Area (m)	Block number	ACT land use zone	Noise zone
R17c	Residential building	ACT	546	Block 1 Section 2 Macnamara	CF Community Facilities; NUZ3 Hills, Ridges and Buffer Areas; RZ1 Suburban	G
R17d	Residential building	ACT	621	Block 1 Section 2 Macnamara	CF Community Facilities; NUZ3 Hills, Ridges and Buffer Areas; RZ1 Suburban	G
R17e	Residential building	ACT	651	Block 1 Section 2 Macnamara	CF Community Facilities; NUZ3 Hills, Ridges and Buffer Areas; RZ1 Suburban	G
R18_Boundary	EPR compliance point	ACT	976	Block 1329 Belconnen	RZ5 High Density Residential; NUZ3: Hills, Ridges and Buffer Areas; RZ3 Urban Residential; CZ5 Mixed Use	G
R18a	Residential building	ACT	1,205	Block 1329 Belconnen	RZ5 High Density Residential; NUZ3: Hills, Ridges and Buffer Areas; RZ3 Urban Residential; CZ5 Mixed Use	G
R18b	Residential building	ACT	1,250	Block 1329 Belconnen	RZ5 High Density Residential; NUZ3: Hills, Ridges and Buffer Areas; RZ3 Urban Residential; CZ5 Mixed Use	F
R18c	Commercial building	ACT	1,494	Block 1329 Belconnen	RZ5 High Density Residential; NUZ3: Hills, Ridges and Buffer Areas; RZ3 Urban Residential; CZ5 Mixed Use	G
NCA1_North	Representative of several EPR compliance points in combination	ACT	51	-	RZ3 Urban Residential	G
NCA1_Centre	Representative of several EPR compliance points in combination	ACT	388	-	RZ1 Suburban; RZ3 Urban Residential	G
NCA1_East	Representative of several EPR compliance points in combination	ACT	46	-	RZ1 Suburban; RZ3 Urban Residential	G
NCA2_East	Representative of several EPR compliance points in combination	ACT	871	-	RZ1 Suburban	G

Receiver ID	Type of receiver	Jurisdiction	Approx. distance from Proposal Area (m)	Block number	ACT land use zone	Noise zone
NCA2_Centre	Representative of several EPR compliance points in combination	ACT	638	-	RZ3 Urban Residential	G
NCA2_West	Representative of several EPR compliance points in combination	ACT	20	-	RZ1 Suburban	G
NCA3_North	Representative of several EPR compliance points in combination	ACT	615	-	PRZ2 Restricted Access Recreation Zone; TSZ1 Transport	G
NCA3_South	Representative of several EPR compliance points in combination	ACT	1,037	-	PRZ2 Restricted Access Recreation Zone; TSZ1 Transport	G
NCA4_North	Representative of several EPR compliance points in combination	ACT	1,118	-	RZ1 Suburban	G
NCA4_South	Representative of several EPR compliance points in combination	ACT	1,587	-	RZ1 Suburban	G
NCA5	Representative of several EPR compliance points in combination	ACT	343	-	CZ5 Mixed Use	F
R19	Residential building	NSW	>1,500	Lot 1 DP771051	N/A	G
R20	Residential building	NSW	>1,500	Lot 1 DP546815	N/A	G
R21	Residential building	NSW	>1,500	Lot 1 DP602262	N/A	G
R22	Residential building	NSW	>1,500	Lot 1 DP602262	N/A	G
R23	Residential building	NSW	>1,500	Lot 1 DP602262	N/A	G
R24 (NCA6)	Residential building	NSW	>1,500	Lot 1 DP602262	N/A	G
R25	Residential building	NSW	>1,500	Lot 1 DP602262	N/A	G
R26	Residential building	NSW	>1,500	Lot 1 DP602262	N/A	G

Receiver ID	Type of receiver	Jurisdiction	Approx. distance from Proposal Area (m)	Block number	ACT land use zone	Noise zone
R27	Residential building	NSW	>1,500	Lot 62 DP801234	N/A	G
R28 (NCA7)	Residential building	NSW	>1,500	Lot 62 DP801234	N/A	G
R29	Residential building	NSW	>1,500	Lot 62 DP801234	N/A	G
R30	Residential building	NSW	>1,500	Lot 62 DP801234	N/A	G
R31	Residential building	NSW	>1,500	Lot 62 DP801234	N/A	G
R32	Residential building	NSW	>1,500	Lot 62 DP801234	N/A	G
R33	Residential building	NSW	>1,500	Lot 62 DP801234	N/A	G
R34 (NCA8)	Residential building	NSW	>1,500	Lot 62 DP801234	N/A	G
R35	Residential building	NSW	>1,500	Lot 62 DP801234	N/A	G
R36	Residential building	NSW	>1,500	Lot 4 DP771051	N/A	G
R37	Residential building	NSW	>1,500	Lot 4 DP771051	N/A	G
R38 (NCA9)	Residential building	NSW	>1,500	Lot 4 DP771051	N/A	G
R39	Residential building	NSW	>1,500	Lot 5 DP771051	N/A	G
R40	Residential building	NSW	>1,500	Lot 5 DP771051	N/A	G
R41	Residential building	NSW	>1,500	Lot 5 DP771051	N/A	G
R42	Residential building	NSW	>1,500	Lot 2 DP1288764	N/A	G
R43	Residential building	NSW	>1,500	Lot 1 DP1066852	N/A	G
R44	Residential building	NSW	>1,500	Lot 1 DP1288764	N/A	G
R45	Residential building	NSW	>1,500	Lot 1 DP1066852	N/A	G
R46	Residential building	NSW	>1,500	Lot 1 DP1066852	N/A	G
R47 (NCA10)	Residential building	NSW	>1,500	Lot 1 DP1202731	N/A	G
R48	Residential building	NSW	>1,500	Lot 3 DP1202731	N/A	G
R49 (NCA11)	Residential building	NSW	>1,500	Lot 2 DP1202731	N/A	G
R50	Residential building	NSW	>1,500	Lot 2 DP1202731	N/A	G
R51	Shed	NSW	>1,500	Lot 1 DP456896	N/A	G

Receiver ID	Type of receiver	Jurisdiction	Approx. distance from Proposal Area (m)	Block number	ACT land use zone	Noise zone
R52	Residential building	NSW	>1,500	Lot 2 DP1117384	N/A	G
R53	Shed	NSW	>1,500	Lot 1 DP456896	N/A	G
R54	Shed	NSW	>1,500	Lot 1 DP456896	N/A	G
R55 (NCA12)	Residential building	NSW	>1,500	Lot 1 DP456896	N/A	G

10.4 Potential Impacts

Potential noise and vibration impacts of the Proposal, as identified in the risk assessment in **Section 4.2** and summarised in **Section 10.1**, include:

- Reduced local amenity from increased noise in the area during Proposal construction and operation, leading to impacts on people.
- Reduced local amenity from increased vibration in the area, leading to impacts on people or structures.
- Cumulative noise and vibration impacts as a result of the Proposal and other developments in the region.

These potential impacts are assessed in detail below.

10.4.1 Noise

10.4.1.1 Construction

Noise levels from construction sites are highly variable and depend on many factors, including fluctuations in the timing of activities, location of mobile noise sources, and acoustic shielding or reflections from buildings or local terrain.

Construction noise levels were predicted for the four key construction activities described in **Section 2.3.2** in the following scenarios:

- Scenario 1 (Sc.1): Access works (construction of new access tracks around the new alignments).
- Scenario 2 (Sc.2): Construction of new tower footings for Lines 1 and 7.
- Scenario 3 (Sc.3): Conductor stringing for Lines 1 and 7, as well as 3C (to ensure facilitated impacts are captured).
- Scenario 4 (Sc.4): Destringing and demolition of Lines 1 and 7.

There is not expected to be a significant overlap in construction activities in terms of noise impacts on receivers due to the staging of the works. The construction stages are expected to overlap somewhat, however simultaneous construction activities would likely occur in different areas of the Proposal Area which will minimise noise impacts (e.g. conductor stringing needs to occur after the tower footings have been installed at any given location). Noise levels have therefore been predicted for each scenario individually as receivers are likely to be most affected by only one scenario at a time.

The predictions are conservative and assume all equipment associated with each scenario is operating simultaneously. In reality, a receiver would experience a range of noise levels throughout the construction period, depending upon the number and type of plant operating at any one time and their precise location on site. The results in **Table 10.7** therefore represent an expected worst-case noise level for each scenario, which may only occur rarely or perhaps not at all. The highlighted noise levels represent compliance locations (block boundaries) at which the noise standard would be exceeded.

As shown in **Table 10.7**, the results of the construction noise modelling indicate the following:

- For scenario 1 (access works), the day-time noise standard would be exceeded at the following receivers:
  - R01: Southern boundary of Block 1553 Belconnen (LMWQCC) and associated buildings (R01a).
  - R02: Northern corner of Block 413 Stromlo (rural property).
  - R03: South-western corner of Block 72 Coree (rural property).
- For scenario 2 (construction of new tower footings), the day-time noise standard would be exceeded at the following receivers:
  - R01: Southern boundary of Block 1553 Belconnen (LMWQCC).
  - R04: Northern boundary of Block 1634 Belconnen (rural property).
  - R05: South-eastern boundary of Block 1582 Belconnen (rural property).
  - R06: South-western corner of Block 1420 Belconnen (Billabong Aboriginal Development Corporation).
  - R08: Western boundary of Block 1600 Belconnen (rural property) and associated buildings (R08c).
  - NCA3: North-western corner of NCA3 (a small residential area in Holt surrounded by the Burns Golf Club).
- For scenario 3 (stringing of Lines 1 and 7), the day-time noise standard would be exceeded at the following receivers:
  - R01, R01a, R02 and R03 – the same receivers affected by scenario 1.
  - R07: Western boundary of Block 2, Section 35 Strathnairn (the Ginninderry Link property).
- For scenario 3 (stringing of Line 3C, subject to separate approvals, but include in consideration of the overall impact of the network upgrades), the day-time noise standard would be exceeded at the following receivers:
  - R04: Northern boundary of Block 1634 Belconnen (rural property).
- For scenario 4 (demolition of Lines 1 and 7), the day-time noise standard would be exceeded at the following receivers:
  - R01: Southern boundary of Block 1553 Belconnen (LMWQCC) and the LMWQCC buildings (R01a).
  - R03: Northern boundary of Block 72 Coree (rural property) and the Woodstock buildings (R03a and R03b).
  - R04: Northern boundary of Block 1634 Belconnen (rural property).
  - R06a: Buildings on Block 1420 Belconnen (Billabong Aboriginal Development Corporation).
  - R07: Eastern and western boundaries of Block 2, Section 35 Strathnairn (the Ginninderry Link property) and buildings (R07a, R07b and R07c).
  - R16: Southern boundary of Block 1586 Belconnen (Canberra Sand and Gravel) and associated buildings (R16b).

- R17: Southern boundary of Block 1 Section 2 Macnamara (rural property) and associated buildings (R17a-e).
- NCA1: All boundaries of NCA1 (Macnamara).
- NCA2: All boundaries of NCA2 (Strathnairn).
- NCA3: All boundaries of NCA3 (a small residential area in Holt surrounded by the Burns Golf Club).
- NCA5: A small area of businesses located on Parkwood Road adjacent to the Canberra Substation, including R11, R12a, R12b, R13, R14 and R15.

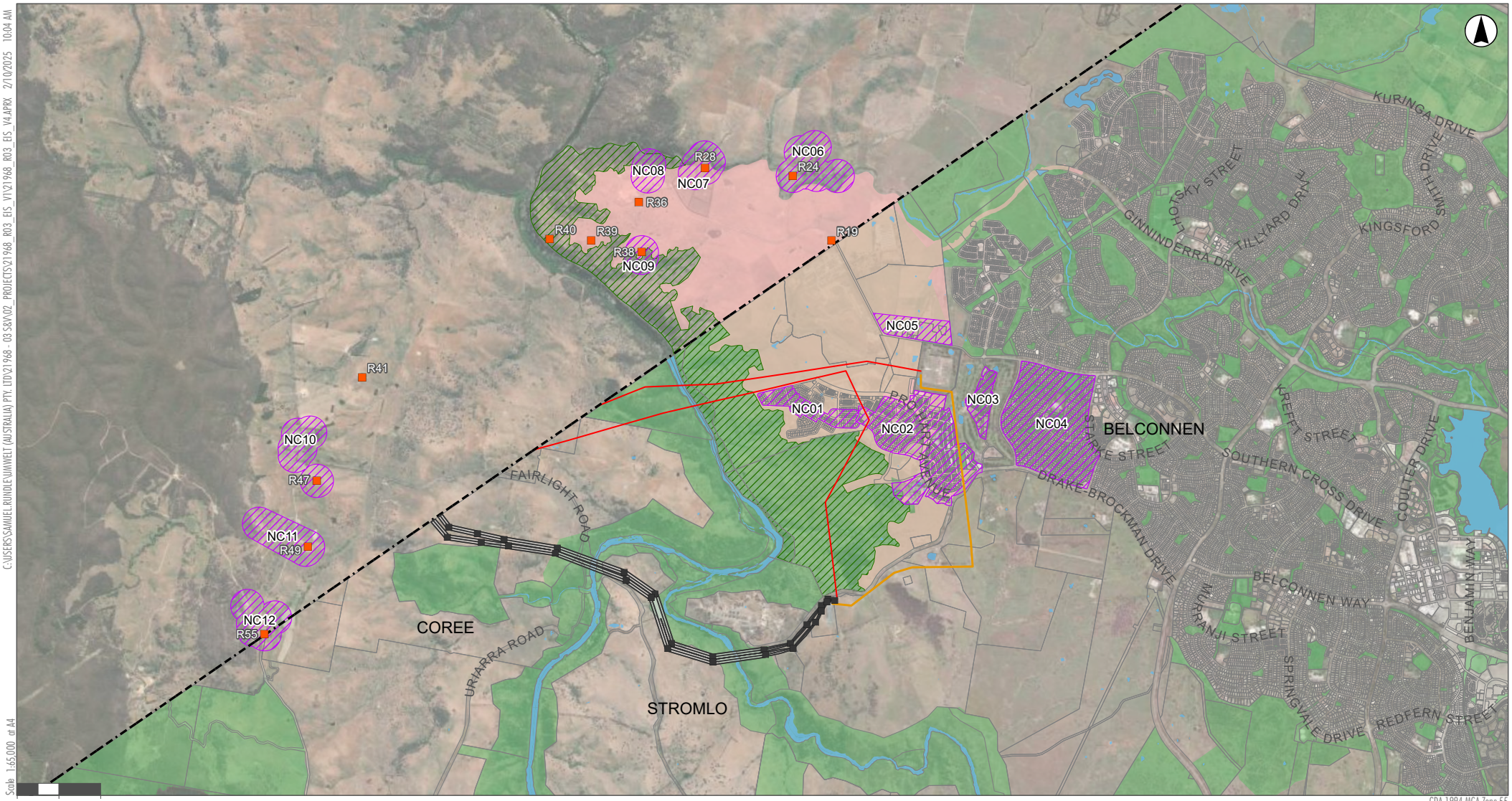
As discussed in **Section 10.2.1.1**, the EPR contains clauses that exempt a development from meeting the noise standards if certain conditions are met. The Proposal would meet these conditions so would be exempt from complying with the EPR noise standards during standard work hours during construction. Any work undertaken out-of-hours (during the night-time period) would need to comply with the noise standards specified in **Table 10.3**.

Table 10.7 Predicted Construction Noise Levels

Receiver ID	Day-time noise standard (dB LA10)	Predicted noise level (dB LA10)			
		Scenario 1	Scenario 2	Scenario 3	Scenario 4
R01_BoundaryS	45	**68**	**50**	**76**	**49**
R01a	45	**48**	43	**57**	**50**
R02_BoundaryN	45	**47**	42	**60**	41
R02a	45	30	24	38	32
R02b	45	24	20	33	30
R03_BoundaryN	45	25	25	38	**77**
R03_BoundarySW	45	**47**	27	**55**	39
R03a	45	36	28	44	**54**
R03b	45	33	28	41	**53**
R04_BoundaryN	45	43	**48**	**53***	**52**
R04a	45	20	36	28	28
R05_BoundarySE	50	12	**52**	24	25
R05a	50	14	44	27	27
R05b	50	17	44	36	35
R06_BoundarySW	45	24	**48**	45	44
R06a	45	24	45	44	**48**
R07_BoundaryE	45	21	33	35	**50**
R07_Boundary_W	45	31	38	**47**	**51**
R07a	45	24	35	39	**50**
R07b	45	24	32	35	**49**
R07c	45	21	33	34	**51**
R08_BoundaryW	45	12	**46**	27	35
R08a	45	13	37	27	37
R08b	45	13	42	28	33
R08c	45	11	**49**	26	31

Receiver ID	Day-time noise standard (dB LA10)	Predicted noise level (dB LA10)			
		Scenario 1	Scenario 2	Scenario 3	Scenario 4
R09_BoundaryW	50	<10	43	20	29
R09	50	10	39	25	31
R10_BoundaryW	50	<10	39	21	28
R10	50	<10	30	18	31
R11	45	20	37	31	**52**
R12a	45	17	37	28	**52**
R12b	45	17	37	28	**51**
R13	45	17	37	30	**52**
R14	45	20	37	32	**55**
R15	45	19	35	31	**49**
R16_Boundary	45	24	37	34	**83**
R16a	45	25	36	34	53
R16b	45	17	35	27	**46**
R16c	45	17	26	25	39
R17_Boundary	45	22	21	33	**54**
R17a	45	24	25	33	**57**
R17b	45	24	21	34	**56**
R17c	45	29	25	38	**55**
R17d	45	29	25	37	**54**
R17e	45	29	25	37	**54**
R18_Boundary	45	13	27	23	40
R18a	45	17	29	29	42
R18b	45	16	26	23	39
R18c	45	16	27	28	40
NCA1_North	45	32	28	41	**72**
NCA1_Centre	45	34	30	43	**57**
NCA1_East	45	34	32	43	**75**
NCA2_East	45	19	44	34	**46**
NCA2_Centre	45	27	37	42	**46**
NCA2_West	45	34	32	43	**80**
NCA3_North	45	19	**54**	34	**47**
NCA3_South	45	17	43	32	**46**
NCA4_North	45	14	37	27	44
NCA4_South	45	15	34	28	38
NCA5	45	21	38	32	**57**

* Exceedance due to Line 3C works, which are considered a facilitated impact of related network upgrades, and not subject to the approvals in this EIS.



Legend

- Transmission Lines to be Removed
- Line 3C Alignment – subject to separate approvals
- Proposed Alignment
- Noise Catchments
- Property Boundaries
- ACT/NSW Border
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development

Receivers

- Commercial
- Residential
- Road
- Shed

FIGURE 10.2

Sensitive Receivers Predicted to be Affected by Construction Noise

Image Source: Nearmap (2022) Data source: ACT Government (2021)

10.4.1.2 Construction Traffic

The TIA estimated that the Proposal would lead to an increase in traffic volumes (including both construction and demolition traffic) of around nine vehicles per hour (vph) on Pro Hart Avenue, Stockdill Drive, Parkwood Road, Uriarra Road, and Fairlight Road (see **Table 10.8**). Based on this, the noise impact assessment estimated that there would be an increase in noise levels of no more than 0.9 dB(A), which is below the adopted 2 dB screening criteria (see **Section 10.2.1.2**). This is considered to be a negligible increase in noise levels.

Table 10.8 Indicative Construction and Demolition Traffic Related Noise

Road	Existing vph	Proposal vph	Combined vph (Existing + Proposal)	Expected Increase in Noise Level Due to Proposal dB(A)
Pro Hart Avenue	1047	9	1056	0.0
Stockdill Drive	39	9	48	0.9
Parkwood Road	533	9	542	0.1
Uriarra Road	57	9	66	0.6
Fairlight Road	57	9	66	0.6

10.4.1.3 Operation

Noise levels associated with typical maintenance activities would be expected to be significantly less than those associated with construction activities. Noise impacts from maintenance activities are anticipated to be minimal, if perceptible.

Maximum predicted noise levels for corona effects are shown in **Table 10.9**. Based on these predictions, the night-time noise standard would be exceeded at one receiver as a result of the Proposal:

- Night-time exceedances:
  - R01: Southern boundary of Block 1553 Belconnen (LMWQCC).

As a result of the related network upgrade of additional conductor stringing on Line 3C, which is subject to separate approvals, but included in this noise assessment for completeness, the night-time noise standard would be exceeded at four receivers under both neutral and enhanced meteorological conditions, and the day-time noise standard would be exceeded at three receivers:

- Day-time exceedances:
  - R04: Northern boundary of Block 1634 Belconnen (rural property).
  - R05: South-eastern boundary of Block 1582 Belconnen (rural property).
  - R08: Western boundary of Block 1600 Belconnen (rural property).
- Night-time exceedances:
  - R04: Northern boundary of Block 1634 Belconnen (rural property).
  - R05: South-eastern boundary of Block 1582 Belconnen (rural property).
  - R08: Western boundary of Block 1600 Belconnen (rural property).

- NCA2: Eastern boundary of NCA2 (Strathnairn).

With the exception of NCA2, the predicted exceedances at the boundary locations do not result in predicted exceedances at the residence location under both calm and enhancing conditions. This distinction has been made as potential early morning emissions of corona noise would have a greater impact at the residence, rather than at the boundary location which is often at the property boundary some distance from the residence.

Due to the close proximity of NCA2 (Strathnairn) residences to Line 3C, noise levels at the residences have not been calculated as they would be similar to the boundary results where the noise standards apply. The predictions indicate that exceedances may occur in the vicinity of NCA2 as a result of the additional lines being added to Line 3C. Residual corona noise from existing lines (+1 dB) would not result in any additional exceedances.

Table 10.9 Maximum Predicted Corona Discharge Noise Levels

Receiver ID	Relevant to Proposal or Line 3C Associated Work	Day-time noise standard (dB LA10)	Night-time noise standard (dB LA10)	Predicted noise levels (dB LA10)	
				Neutral meteorological conditions	Enhanced meteorological conditions
R01_Boundary S	Proposal	45	35	**38**	**39**
R01a	Proposal	45	35	27	30
R02_Boundary N	Proposal	45	35	27	30
R02a	Proposal	45	35	<15	<15
R02b	Proposal	45	35	<15	<15
R03_Boundary N	N/A Removal	45	35	<15	<15
R03_Boundary SW	Proposal	45	35	24	29
R03a	Proposal	45	35	<15	<15
R03b	Proposal	45	35	<15	<15
R04_Boundary N	Proposal and Line 3C	45	35	**46**	**46**
R04a	Proposal and Line 3C	45	35	17	23
R05_Boundary SE	Line 3C	50	40	**43**	**43**
R05a	Line 3C	50	40	37	38
R05b	Line 3C	50	40	26	30
R06_Boundary SW	Line 3C	45	35	27	30
R06a	Line 3C	45	35	25	29
R07_Boundary E	Line 3C	45	35	22	27
R07_Boundary _W	Line 3C	45	35	<15	19

Receiver ID	Relevant to Proposal or Line 3C Associated Work	Day-time noise standard (dB LA10)	Night-time noise standard (dB LA10)	Predicted noise levels (dB LA10)	
				Neutral meteorological conditions	Enhanced meteorological conditions
R07a	Line 3C	45	35	17	23
R07b	Line 3C	45	35	18	24
R07c	Line 3C	45	35	20	26
R08_Boundary W	Line 3C	45	35	**47**	**47**
R08a	Line 3C	45	35	25	29
R08b	Line 3C	45	35	27	30
R08c	Line 3C	45	35	25	29
R09_Boundary W	Line 3C	50	40	18	24
R09	Line 3C	50	40	<15	17
R10_Boundary W	Line 3C	50	40	<15	18
R10	Line 3C	50	40	<15	<15
R11	Line 3C	45	35	20	25
R12a	Line 3C	45	35	21	26
R12b	Line 3C	45	35	20	25
R13	Line 3C	45	35	21	26
R14	Line 3C	45	35	20	26
R15	Line 3C	45	35	18	23
R16_Boundary	Line 3C	45	35	17	23
R16a	Line 3C	45	35	15	21
R16b	N/A Removal	45	35	<15	16
R16c	N/A Removal	45	35	<15	<15
R17_Boundary	N/A Removal	45	35	<15	<15
R17a	N/A Removal	45	35	<15	<15
R17b	N/A Removal	45	35	<15	<15
R17c	N/A Removal	45	35	<15	<15
R17d	N/A Removal	45	35	<15	<15
R17e	N/A Removal	45	35	<15	<15
R18_Boundary	N/A Removal	45	35	<15	<15
R18a	N/A Removal	45	35	<15	<15
R18b	N/A Removal	45	35	<15	<15
R18c	N/A Removal	45	35	<15	<15
NCA1_North	N/A Removal	45	35	<15	<15
NCA1_Centre	N/A Removal	45	35	<15	<15
NCA1_East	N/A Removal	45	35	<15	16
NCA2_East	Line 3C	45	35	**45**	**45**
NCA2_Centre	Line 3C	45	35	22	27

Receiver ID	Relevant to Proposal or Line 3C Associated Work	Day-time noise standard (dB LA10)	Night-time noise standard (dB LA10)	Predicted noise levels (dB LA10)	
				Neutral meteorological conditions	Enhanced meteorological conditions
NCA2_West	Line 3C	45	35	<15	18
NCA3_North	Line 3C	45	35	31	33
NCA3_South	Line 3C	45	35	26	30
NCA4_North	Line 3C	45	35	19	24
NCA4_South	Line 3C	45	35	16	22
NCA5	Line 3C	45	35	21	26

10.4.2 Vibration

All receivers fall outside the minimum working distances outlined in **Table 10.5**, thus no vibration impacts are anticipated during Proposal construction.

10.4.3 Cumulative Impacts

Cumulative noise impacts associated with construction and/or operation of the Proposal could as a result of the required network upgrades facilitated by the Proposal on Line 3C, and could also occur if the areas of Strathnairn and Macnamara along the western boundary of the Ginninderry development are constructed concurrently to the Proposal (these areas are currently planned for development in 2023–2032 (Ginninderry, 2022)), or if the Territory Battery project, which is proposed on Block 1634 Belconnen, is constructed at the same time (in 2025–2026).

Noise emissions resulting from the stringing of additional conductors on Line 3C have been modelled in **Section 10.4** to provide a complete picture of noise impacts from known associated works. The GJV is aware that community complaints had been made about noise emitted from the existing Line 3C. No information was able to be obtained from the EPA or Access Canberra about the nature of these complaints or the nature of the noise issues, but they are assumed to relate to corona discharge from the existing operational powerlines (Line 3C already has two conductors strung along the lines). With the addition of a third conductor along Line 3C, there could be increased impacts on receivers located adjacent to Line 3C due to cumulative impacts from the existing lines. NCA2 is most likely to be affected, where operational noise impacts from the additional conductors on Line 3C may occur in isolation (see **Section 10.4.1.3**). Measures for mitigating operational noise are discussed in **Section 10.5.2**. It is understood that operational noise from transmission lines is higher in the 1–2 years following installation due to grease used on the pulleys during cable installation. Thus, any operational noise impacts from Line 3C are expected to diminish 1–2 years construction ceases. This noise impact assessment will also be included in the separate approvals for Line 3C.

The nature of the noise emissions during construction of Strathnairn, Macnamara and the Territory Battery developments would be similar to construction of the Proposal, involving the operation of plant, equipment and vehicles throughout the area, although noise levels would be higher due to the larger scale of development. As discussed in **Section 10.4.1**, noise emitted during Proposal construction and operation would likely be audible at receivers located in Strathnairn, near the Territory Battery and in the surrounding area, and noise from the construction of these developments would undoubtedly be audible at the same locations.

The Proposal may result in cumulative noise impacts when considered in conjunction with operation of the LMWQCC, Territory Battery, Stockdill Substation and Canberra Substation. Although it is expected that these utilities would separately be compliant with the EPR and that their noise emissions would not be above the noise standards at off-site locations, it is likely that they would both be audible at off-site receivers to some degree, in which case cumulative impacts would occur. Noise mitigation measures for the Proposal are provided in **Section 10.5**.

This EIS cannot reasonably predict the cumulative noise levels at any given receiver as it is not known what the noise levels of the construction of Strathnairn, Macnamara and Territory Battery; or the operation of the LMWQCC, Territory Battery, Stockdill Substation and Canberra Substation; would be.

The Proposal is not expected to result in any cumulative vibration impacts during construction or operation, as the Proposal is not sufficiently close to any receivers to cause any building or amenity impacts due to ground-borne vibration.

10.5 Mitigation and Management Measures

10.5.1 Construction and Demolition

AS 2436 provides guidance on how to identify, measure, assess and plan for noise and vibration control on development sites. Measures outlined in the standard will be implemented during Proposal construction to ensure that noise exemptions in the EPR can be applied.

A Construction Noise and Vibration Management Plan (CNVMP) will be developed for the Proposal as a sub-plan to the CEMP. The CNVMP will contain controls for minimising noise and vibration generated during construction. These controls will be consistent with AS 2436 and be implemented as per the following hierarchy:

1. Controlling the source of noise/vibration, e.g. through the selection of low impact equipment, planning of work sites and activities, and maintenance of equipment.
2. Controlling the spread of noise/vibration (path control), e.g. by increasing the distance between a source and receiver and installing temporary barriers.
3. Controlling impacts at the receiver, e.g. through the use of localised barriers and notifying the community of planned activities and potential impacts.

Specific control measures that will be implemented include:

- Low noise equipment and construction methodologies will be selected where possible.
- Equipment and vehicles will be turned off when not in use.
- Equipment and vehicles will be regularly serviced in accordance with manufacturer requirements.
- Acoustic covers on machine engines will remain closed at all times.
- Plant will be located and orientated to direct noise away from the nearest occupied receivers where possible.

- Noisy machinery will not be operated simultaneously or in a concentrated location where possible (e.g. for earthmoving and ground-impacting operations). In particular, overlapping construction stages will be undertaken in different locations of the Proposal Area to minimise impacts on receivers.
- Controls for minimising traffic-related noise will be implemented, such as decreasing vehicle speeds in the vicinity of residential areas, and avoiding compression braking and the use of air brakes near residential areas.
- Reversing of vehicles and plant will be avoided where possible, to minimise the noise emitted from reverse alarms.
- Hearing protection and training for managing noise impacts will be provided to construction personnel associated with the Proposal.
- Vibration-generating equipment (e.g. vibratory rollers) will be sized to avoid the risk of damage to nearby structures.
- Protocols for community consultation and complaints handling will be documented, including noise affected properties to be notified of the timing, duration and nature of construction works at least seven days prior to works commencing.
- Management strategies will be documented in the event that works are required outside of standard working hours.

Traffic-related noise impacts will be managed using controls specified in a Traffic Management Plan (TMP), such as heavy vehicle speed limits in the vicinity of residential areas and avoiding compression braking and the use of air brakes near residential areas. These measures are discussed further in **Section 11.5**.

The GJV will liaise with the developers of other construction projects in the area with the aim of scheduling noisy construction activities of the Proposal to minimise cumulative noise impacts on receivers.

The actual construction equipment to be used on site will be confirmed by the construction contractor during the detailed design phase of the Proposal. For any vibration-generating equipment not listed in **Table 10.5**, minimum working distances would need to be established.

In the event that any vibration-generating equipment would be used within the recommended safe working distances nominated in **Table 10.5**, or in the event that undocumented heritage structures are discovered during construction, the following will be documented in the CNVMP and implemented:

- An independent specific structural assessment of the structure will be undertaken to ascertain the structural integrity and its ability to withstand vibration, and to establish an appropriate vibration minimum working distance and impact criteria.
- A dilapidation survey of the structure will be undertaken prior to works commencing, and regular inspections will be conducted throughout the construction activities.
- Site-specific vibration minimum working distances will be identified for the equipment once selected.
- Where appropriate, continuous vibration monitoring will be conducted on the structure for the duration of the period of construction while vibration generating equipment is being used.
  The vibration logger will be equipped with the ability to remotely alert construction staff to reduce or cease construction activities if vibration levels are approaching the criterion threshold.

10.5.2 Operation

Mitigation measures for corona discharge may include line fittings (such as hardware corona rings) and conductor arrangements (i.e. increasing the conductor size, increasing the distance between conductors and using bundled conductors) which can reduce corona effects.

If corona discharge noise is identified as an issue via community complaints, noise monitoring will be undertaken to determine noise levels. As per standard practice, at-property treatments, if triggered, would need to be determined in consultation with the landholder and informed by a detailed building condition survey and final confirmed noise levels. Noise monitoring during corona discharge conditions and building condition surveys would determine if acoustic treatment is required and the level of treatment required.

Many complaints resulting from corona discharge are resolved through explanation and reassurance, with physical modification generally applied only if noise is abnormal or persistent. Noise complaints will be handled through GJV, or once operational, through Transgrid's established Complaints Handling Policy.

10.6 Residual Risk Assessment

The residual risk assessment in **Table 10.10** provides revised risk ratings with consideration of the mitigation and management measures discussed in **Section 10.5**. Residual risk ratings range from negligible to low, with all risks able to be reduced to ALARP. No significant residual risks are predicted to occur.

Table 10.10 Residual Assessment of Risks Associated with Noise and Vibration

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Construction								
N1	Proposal construction activities lead to an increase in noise levels in the surrounding area which reduces local amenity, potentially impacting nearby people and resulting in community complaints and/or non-compliance with the EP Act.	High	No	• Industry best practice CEMP will be implemented that includes a CNVMP for mitigating and managing noise impacts. It will include controls that are consistent with AS 2436 as well as the following: o Low noise equipment and construction methodologies to be selected where possible. o Equipment and vehicles to be turned off when not in use. o Equipment and vehicles to be regularly serviced in accordance with manufacturer requirements. o Acoustic covers on machine engines to remain closed at all times. o Plant to be located and orientated to direct noise away from the nearest occupied receivers where possible. o Noisy machinery to not be operated simultaneously or in a concentrated location where possible.	Possible	Moderate	Medium	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				○ Controls for minimising traffic-related noise, such as decreasing vehicle speeds in the vicinity of residential areas, and avoiding compression braking and the use of air brakes near residential areas. ○ Reversing of vehicles and plant to be avoided where possible. ○ Hearing protection and training to manage noise impacts to be provided to Proposal construction personnel. • Traffic-related noise impacts will be managed using controls specified in a TMP (see **Section 11.5**), such as: ○ Heavy vehicle speed limits to be used in the vicinity of residential areas. ○ Compression braking and the use of air brakes to be avoided near residential areas. • The CEMP will contain protocols for community consultation and complaints handling. Noise affected properties will be notified of the timing, duration and nature of construction works at least seven days prior to works commencing. • The CNVMP will specify management strategies in the event that works are required outside of standard working hours. All on-site workers will be inducted on the CNVMP and be provided with training to manage noise impacts.				

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
N2	Proposal construction activities lead to off-site vibration which reduces local amenity, potentially impacting nearby people and resulting in damage to nearby structures.	Medium	No	• The CNVMP will include measures for mitigating and managing vibration impacts such as: o Equipment and vehicles to be turned off when not in use. o Equipment and vehicles to be regularly serviced in accordance with manufacturer requirements. o Vibration-intensive machinery to not be operated simultaneously or in a concentrated location where possible. o Vibration-generating equipment to be sized to avoid the risk of damage to nearby structures. o Once construction equipment has been selected, minimum working distances to be established for vibration-generating equipment not listed in **Table 10.5**. Site-specific vibration minimum working distances to be identified for all equipment once selected. • Additional mitigation measures will be included in the CNVMP depending on the results of geotechnical investigations and need for vibration-inducing equipment, such as the use of smaller or different machinery.	Unlikely	Minor	Very low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				• In the event that any vibration-generating equipment would be used within the recommended safe working distances nominated in **Table 10.5**, or in the event that undocumented heritage structures are discovered during construction, the following will be documented in the CNVMP and implemented: o An independent specific structural assessment of the structure will be undertaken to ascertain the structural integrity and its ability to withstand vibration, and to establish an appropriate vibration minimum working distance and impact criteria. o A dilapidation survey of the structure will be undertaken prior to works commencing, and regular inspections will be conducted throughout the construction activities. o Where appropriate, continuous vibration monitoring will be conducted on the structure for the duration of the period of construction while vibration generating equipment is being used. The vibration logger will be equipped with the ability to remotely alert construction staff to reduce or cease construction activities if vibration levels are approaching the criterion threshold. • The CEMP will contain protocols for community consultation and complaints handling.				

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				• The CNVMP will specify management strategies in the event that works are required outside of standard working hours. All on-site workers will be inducted on the CNVMP and be provided with training to manage vibration impacts.				
N3	Cumulative noise and vibration impacts occur as a result of Proposal construction and other developments in the region.	High	No	• The CEMP will include a CNVMP with controls for managing noise and vibration associated with construction of the Proposal (refer to specific mitigations provided for N1 and N2). • The GJV will liaise with the developers of other construction projects in the area with the aim of scheduling noisy and vibration-inducing construction activities of the Proposal to minimise cumulative impacts on receivers.	Unlikely	Moderate	Low	Yes
Operation								
N4	Once operational, noise from the Proposal (caused by corona discharge) reduces local amenity, potentially impacting nearby people and resulting in community complaints and/or non-compliance with the EP Act.	Low	No	• Detailed design at DA Stage will include consideration of measures for mitigating corona effects, including the use of line fittings (such as hardware corona rings) and conductor arrangements (i.e. increasing the conductor size, increasing the distance between conductors and/or using bundled conductors).	Unlikely	Minor	Very Low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				• If corona discharge noise is identified as an issue via community complaints, noise monitoring will be undertaken to determine noise levels. As per standard practice, at-property treatments, if triggered, would need to be determined in consultation with the landholder and informed by a detailed building condition survey and final confirmed noise levels. Noise monitoring during corona discharge conditions and building condition surveys would determine if acoustic treatment is required and the level of treatment required. • Complaints handling process will be communicated to sensitive receivers within the Proposal Area.				
N5	Cumulative noise impacts occur as a result of the Proposal once operational and other developments in the region.	Low	No	• Refer to the measures listed for N4 for mitigating operational noise impacts of the Proposal.	Unlikely	Minor	Very Low	Yes

11.0 Traffic and Transport

Chapter Summary
This chapter provides an assessment of potential traffic and transport impacts on the local road network as a result of construction, demolition and maintenance of the Proposal.

11.1 Preliminary Risk Assessment

An assessment of traffic risks of the Proposal is provided in **Table 11.1**. The risk ratings range from negligible to high, with significant impacts possible from inadequate construction and demolition traffic management leading to accidents or ecological impacts.

Section 11.2 to **Section 11.4** provide a detailed assessment of these risks. The residual risk assessment in **Section 11.6** provides revised risk ratings for each risk based on the mitigation and management measures described in **Section 11.5**.

Table 11.1 Preliminary Assessment of Risks Associated with Traffic

ID	Risk Scenario	Preliminary Risk Assessment			
		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Construction					
T1	Increased volumes of construction and demolition traffic on local roads, construction of Proposal access tracks, and stringing/destringing of conductors over public roads result in traffic disruptions to residents and other road users.	Possible	Minor	Low	No
T2	Temporary traffic management measures implemented during construction and demolition are not suitable and result in near miss incidents, crashes, injuries or death.	Unlikely	Catastrophic	High	No
T3	Uncontrolled access by construction and demolition vehicles leads to dispersal of litter or other pollutants, damage to habitats or areas to be retained, and spread of weeds within the Proposal Area and/or areas outside the Proposal Area.	Possible	Moderate	Medium	No
T4	Construction of access tracks results in unanticipated vegetation clearance.	Possible	Moderate	Medium	No
T5	Cumulative traffic congestion impacts occur as a result of the Proposal and other developments in the region	Possible	Minor	Low	Yes
Operation					
T6	Increased volumes of maintenance traffic on local roads result in traffic disruptions to residents and other road users.	Unlikely	Minimal	Negligible	Yes

11.2 Investigations

A Traffic Impact Assessment (TIA) was prepared for the Proposal by Egis Consulting Pty Ltd (see **Appendix G7**). The TIA was prepared in accordance with the requirements of the TCCS Guidelines for Transport Impact Assessment (TCCS, 2020).

The TIA involved an assessment of the expected traffic volumes generated by the Proposal (including both construction and demolition traffic), the suitability of transit routes and access points to service the Proposal, and the traffic congestion which would be expected along the impacted road network as a result of the Proposal. The TIA was prepared with consideration of the documents in **Table 11.2**.

Table 11.2 Information Sources Used for the Traffic and Transport Impact Assessment

Information sources used for the noise impact assessment	Relevance to the traffic and transport impact assessment
Guidelines for Transport Impact Assessment (TCCS, 2020)	The Guidelines outlines how a transport impact assessment should be undertaken and in particular regarding traffic issues. The traffic impact assessment was completed in accordance with these requirements.
Territory Plan Estate Development Code (August 2020)	This code provides additional planning, design and environmental controls to support the objectives of the relevant zone.
Guide to Traffic Generating Developments (RTA, 2002)	The Guide provides information regarding traffic issues for submitting Development Applications and provides background information into likely impacts of traffic from development.
Austroads Guide to Traffic Management documents (Austroads, 2020)	These Guides provide comprehensive traffic management guidance in traffic engineering, road design and road safety.
ACT City Services Heavy Vehicle Conditions and Network information	The information provided by ACT City Services details the types of heavy vehicles and where they are authorised to drive on some Canberra roads.
ACT Open Data Portal – Road Crash Heat Map (data from 2012 to 2021) (TCCS, 2022)	The Road Crash Heat Map provided data on crashes within or adjacent to the Proposal Area.
Multi-State Class 1 Load Carrying Vehicle Dimension Exception Notice (NHVR, 2023)	The Notice outlines eligible vehicles and their requirements to operate a Class 1 Load Carrying Vehicle (LCV) in participating jurisdictions.
ACT Load Carrying Vehicles Stated Routes and Areas (NHVR, 2020)	This document is referred to in Multi-State Class 1 Load Carrying Vehicle Dimension Exception Notice (NHVR, 2023) and provides the stated routes and area conditions necessary for the application of the LCV Notice in the ACT.

To determine the level of traffic congestion that could occur during Proposal construction, existing traffic reports were reviewed to identify base road volumes during the expected period of construction and demolition. The following reports which were previously prepared by Egis were considered:

- Macnamara Neighbourhood 02 Second Estate Development Plan – Traffic Impact Assessment.
- Canberra Sand and Gravel – Traffic Impact Assessment.

Proposal construction vehicle levels were compared to the theoretical vehicle capacity of each road and the anticipated 2026 traffic volumes. The theoretical vehicle capacities were calculated based on the advice provided in the Guide to Traffic Management Part 3: Transport Studies and Analysis (Austroads, 2017), and the 2026 traffic volumes were obtained from the Canberra Strategic Transport Model (CSTM) data (City Services, 2023).

11.3 Existing Conditions

11.3.1 Road Network

The major transit routes to be used by Proposal construction, demolition and maintenance vehicles include Pro Hart Avenue, Stockdill Drive, Uriarra Road, Fairlight Road and Parkwood Road (see **Figure 11.1**).

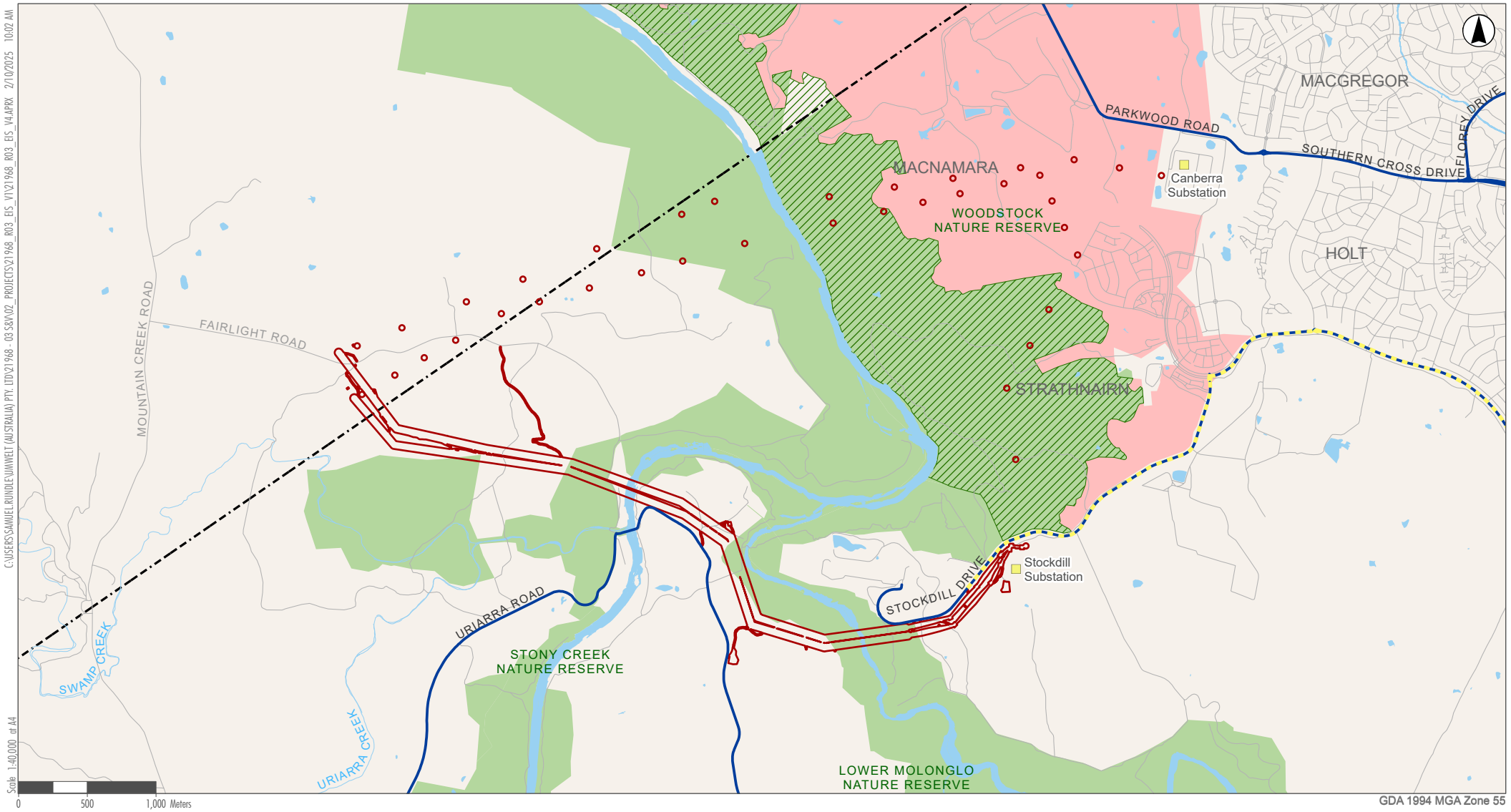
Pro Hart Avenue is an arterial road that only connects to a wider road network at one end, with the southern end intersecting with Spofforth Street and Drake Brockman Drive at the boundary between Strathnairn and Holt. To the north, the road terminates directly before the edge of Macnamara, with intentions for it to be extended during construction of Macnamara. The section of Pro Hart Avenue between Drake Brockman Drive and Stockdill Drive is listed as a heavy vehicle route (see **Figure 11.1**), so would be suitable for use by Proposal construction and demolition vehicles. To the west of Stockdill Drive, Pro Hart Avenue is not listed as a heavy vehicle route, however the design of the road is set to match the criteria of the approved heavy vehicle section. As such, road width and turning movements are all assumed to be sufficient to cater for heavy vehicle movements associated with Proposal construction and demolition works.

Stockdill Drive is a rural distributor road which extends approximately 3.4 km from Pro Hart Avenue in the northeast to the LMWQCC in the southwest. Stockdill Drive comprises a single 7 m wide carriageway which supports traffic in each direction. Stockdill Drive also connects into the wider heavy vehicle network, with vehicles being able to access this road using Drake Brockman Drive. Stockdill Drive is able to cater for most heavy vehicle movements and as such, movements of heavy vehicles should be able to utilise the road without the need for temporary traffic management.

Uriarra Road is suitable for heavy vehicles use without special management or controls, however, typically only vehicles associated with forestry and livestock are permitted to use the road. As such, permission may be required from ACT City Services to utilise this road for the purpose of the construction and demolition vehicles. Discussions with this entity would be required prior to construction and demolition commencing for the Proposal to ensure that use of this road by Proposal construction and demolition vehicles is appropriate. Connection onto Uriarra Road for heavy vehicles is available from John Gorton Drive, which is an approved route for most heavy vehicles, and does not have the restrictions which Uriarra Road has for B-double and higher mass limit (HML) vehicles.

Fairlight Road is classified as a rural road. It connects Uriarra Road to Mountain Creek Roak and runs through both NSW and the ACT. The road is paved, but some sections are in poor repair. Fairlight Road is not classified as a heavy vehicle route within the ACT. Its width varies from 4.5 m to 6 m for two-way vehicle movements, with no road shoulders, making it difficult for heavy vehicles to traverse the road while allowing oncoming traffic to pass. Due to the narrow road width and tight horizontal curves, temporary traffic management would be required to manage oncoming vehicles and limit their interaction with any heavy vehicle movements required for Proposal construction or demolition.

Parkwood Road is an arterial road with mostly rural frontages. It is a 2-lane 2-way rural road with an 8.2 m pavement and grassed shoulder, which extends into both the ACT and NSW. Driveways to commercial developments occur sporadically along its length. The road alignment varies and has a relatively tight bend west of its intersection with Britten Jones Drive in Holt. Parkwood Road is appropriate for most heavy vehicle movements and as such, specific traffic management is not required for the Proposal. It can be accessed via Southern Cross Drive, which is also suitable for most heavy vehicle movements. Discussions with relevant ACT and NSW government authorities will be conducted prior to construction and demolition to confirm whether access via Fairlight Road is suitable, or if utilising another road to avoid the bridge is preferable.



Legend

- Proposal Area
- Proposed Transport Route
- Approval Routes
- ACT/NSW Border
- Road
- Nature Reserve
- Watercourses
- Drainage Line
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Existing Substation

FIGURE 11.1

Key Propsosal Transport Routes

Image Source: Nearmap (2023) **Data source:** ACT Government (2023)

11.3.2 Existing Traffic Conditions

To determine baseline traffic conditions and congestion of the key Proposal transit routes during the period of Proposal construction, 2026 traffic volume estimates were compared against the theoretical vehicle capacity of each of the roads (see **Table 11.3**). From this comparison, it can be seen that all roads except Pro Hart Avenue would be operating within their theoretical capacity volumes in 2026 without the Proposal, and with significant spare capacity. Pro Hart Avenue would have small level of congestion during both the morning (AM) and afternoon (PM) peak periods.

It should be noted that the 2026 traffic volume estimates may contain some additional traffic growth to what would be expected from the actual date of Proposal construction, given that the Proposal construction works are planned to commence in 2026.

Table 11.3 Theoretical Road Capacity and 2026 Traffic Volume Estimates without Proposal Construction Traffic

Road Name	Calculated Traffic Capacity – One-way (vph)	Predicted AM Peak Volumes – One-way (vph)	Predicted PM Peak Volumes – One-way (vph)
Pro Hart Avenue	1,000	**1,023**	**1,070**
Stockdill Drive	1,371	38	40
Uriarra Road	1,253	60	53
Fairlight Road	783	60	53
Parkwood Road	900	595	470

11.3.3 Crash History

A vehicle accident or crash is any unplanned event involving a road vehicle on a road that results in death, injury or property damage and is reported to the police. An analysis of vehicle crash statistics recorded between 2012 and 2022 shows that there were several crashes within or adjacent to the Proposal Area. Crashes recorded along the key transit routes to be utilised for the Proposal are summarised in **Table 11.4**.

Table 11.4 Vehicle Crash Numbers Along Proposal Transit Routes Between 2012 and 2022 (TCCS, 2022)

Road	Road Length (km)	Total Number of Crashes	Crashes per Year per Kilometre
Parkwood Road / Southern Cross Drive, between the Canberra Sand and Gravel site and Kingsford Smith Drive	4.6	206	5
Pro Hart Avenue / Drake Brockman Drive, from Kingsford Smith Drive to the end	4.7	69	2
Stockdill Drive, from Pro Hart Avenue to the end	3.4	3	0.1
Uriarra Road, from Fairlight Road to John Gorton Drive	12.2	201	2
Fairlight Road, from Uriarra Road to Mountain Creek Road	4.8	1	0

The crash heat map in **Figure 11.2** shows that most of the above crashes occurred close to the highly patronised Uriarra Recreation Reserve Area, or within ACT suburbs. Crashes have occurred along the length of Uriarra Road, but are noticeably clustered at Uriarra Crossing. This indicates that the use of Uriarra Crossing and Fairlight Road by heavy vehicles during Proposal construction and demolition may require special temporary traffic management (TTM) measures to minimise the risk of safety incidents.

For Parkwood Road / Southern Cross Drive, the majority of crashes were reported at the Kingsford Smith Street intersection, and the two Starke Street intersections. Given the location and layout of these intersections, it is predicted that most of these crashes are either rear-end crashes at the signals, or due to sight distance limitations causing vehicles to select inappropriate gaps in oncoming traffic at the priority-controlled intersections.

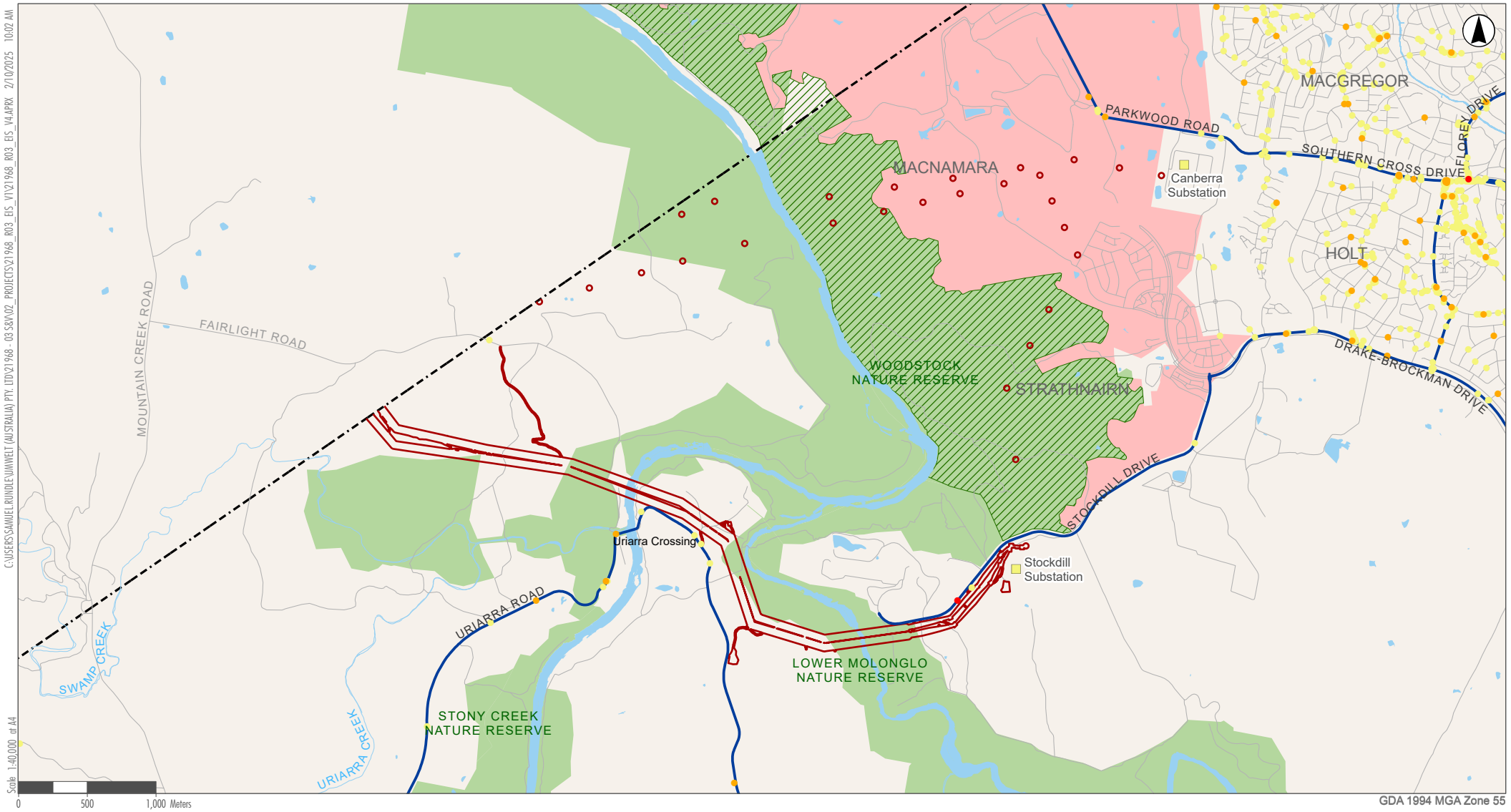
For the remaining roads, the crash volumes are low enough to indicate that there are no specific safety hazards along the road.

11.4 Potential Impacts

Potential impacts of the Proposal as identified in the risk assessment in **Section 4.2** and summarised in **Section 11.1**, include:

- Traffic congestion on local roads causing disruption to residents and other road users.
- Traffic disruption and safety issues from inadequately planned traffic management.
- Environmental damage caused by uncontrolled movements of construction or demolition vehicles.
- Cumulative traffic congestion impacts occurring in conjunction with other developments.

These potential impacts are assessed below. Indirect impacts on biodiversity are discussed in more detail in **Section 5.4.6**.



Legend

- Proposal Area
- Approved Higher Mass Limit (HML) Transport Routes
- ACT/NSW Border
- Road
- Nature Reserve
- Watercourses
- Drainage Line
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Existing Substation

Road Crash Locations

- Fatal
- Injury
- Property Damage Only

FIGURE 11.2
Crash Heat Map

Image Source: Nearmap (2023) **Data source:** ACT Government (2023)

11.4.1 Traffic Congestion

Given the variable nature of construction sites and the unique requirements for each construction project, there are no standard traffic generation rates available which provide a suitable estimate for the number of vehicle trips that each type of construction or demolition vehicle would make. As such, the following assumptions have been made based of previously observed construction site traffic around the ACT and NSW:

- 4x4 utes and other personal worker vehicles (light vehicles) – Assumed that an average of four trips per vehicle per day would be generated. This assumes that workers would need vehicle trips to arrive and depart from the site, as well as arriving and departing for lunch / meetings once a day. For the peak hour periods, it is assumed that only a single trip would be generated per vehicle.
- Agitator trucks (heavy vehicles) – Assumed that an average of eight trips per vehicle per day would be generated. For peak hour periods, it is assumed that a maximum of one trip would be generated per vehicle, as deliveries will be scheduled to occur outside of peak periods where practicable.
- Truck and dog and truck trailer combinations (heavy vehicles) – Assumed that an average of 10 trips per vehicle per day would be generated. This allows for five deliveries of material / collection of waste to occur over the course of the day per vehicle. For peak hour periods, it is assumed that a maximum of two trips would be generated per vehicle, as pick-ups and deliveries will be organised outside of peak periods where practicable.
- Specialised construction vehicles (cranes, excavators, graders, hiab trucks etc.) (heavy vehicles) – Assumed that the vehicles would remain on site for the duration of the construction activity, and would not journey to and from the site each day. For the purpose of this assessment, it has been conservatively assumed that a maximum of one vehicle trip per day would occur for each of these vehicles at the start and end of the estimated usage period. It is assumed that these vehicles would arrive and depart outside of peak hour periods, and as such their movements would not impact upon busy periods for commuter traffic.

Vehicle movements between individual tower locations were not accounted for as these trips are not expected to impact on public roads. Based on the above information, an estimate of the number of construction and demolition vehicles per day and vehicles per hour (vph) that would be generated during each stage of Proposal construction and demolition was calculated. The estimated volumes of both light and heavy vehicles generated during each stage can be seen in **Table 11.5**.

Table 11.5 Maximum Construction Vehicle Levels During Proposal Construction

Construction Stage	Proposal Construction Vehicle Volumes (vph)			
	LV	HV (Delivery)[1]	HV (Working)[1]	Total
Mobilisation	4	2		**6**
Access works	4	2		**6**
New tower footing construction	6	3		**9**
New tower assembly/erection	7	-		**7**
Stringing of Lines 1 and 7	7	-		**7**
Destringing and demolition of existing Lines 1 and 7	3	2		**5**
Demobilisation	4	2		**6**
Maximum	**7**	**3**		**9**

[1]*Delivery vehicles include hiab trucks and concrete agitator trucks. Working vehicles include cranes, graders, excavators, and similar. Refer to* ***Section 2.3.2*** *for more information on the types of vehicles required for Proposal construction.*

As each of the key transit routes in the Proposal Area would be operating with considerable spare capacity in 2026 without the Proposal, except for Pro Hart Avenue (see **Table 11.3**), the addition of up to 9 vph as a result of the Proposal would have a negligible impact on traffic congestion on the road network. Although Pro Hart Avenue may already be operating with some level of congestion during Proposal construction and demolition, the addition of up to 9 vph as a result of the Proposal is not expected to have a noticeable impact on congestion levels. As such, these roads can all be expected to operate within acceptable levels of congestion during Proposal construction and demolition.

It is not expected that construction will require any substantial road closures. The demolition of towers and construction of access tracks and new towers should not require road closures. The only scenario in which roads may require short term closure, would be during the stringing of new conductors over Fairlight Road (which is located in NSW and subject to separate approvals), and the removal of old conductors over Stockdill Drive (located in the ACT). These closures would be very short term in nature, and able to be managed through a Traffic Management Plan (TMP) prepared at DA stage.

Demolition works within the development area of Ginninderry would be managed as part of existing construction activities by Ginninderry Development, and consistent with existing construction traffic management, and would not involve public road closures.

Impacts would be unlikely to occur during Proposal operation due to the extremely small number of vehicles needed for Proposal maintenance (inspections would be undertaken by 4WD utes, drones or helicopters, while maintenance work would require a single 32 t bucket lifter truck).

11.4.2 Suitability of Construction Vehicle Transit Routes

To determine the suitability of each of the key transit routes expected to be used during Proposal construction and demolition, a review of the road conditions and design parameters was undertaken. This review considered whether the roads are listed as official heavy vehicle routes by the ACT Government, as well as the road width, horizontal geometry, pavement strength, and turning movement allowance at intersections to identify whether the roads are suitable for use by vehicles of the size and weight proposed for use in these construction and demolition activities.

All roads except for Fairlight Road are expected to be suitable for construction and demolition heavy vehicle use without significant management activities. Stockdill Drive, Uriarra Road, Parkwood Road and a portion of Pro Hart Avenue are listed as part of the ACT heavy vehicle route network, and are suitable for use by heavy vehicles up to B-double and HML size. As such, heavy vehicle movements to, from, and along these roads are unlikely to require any specific TTM measures to enable these vehicle movements. Discussions will be held with ACT City Services and any other relevant agency to confirm these movements are suitable, particularly for Uriarra Road and Pro Hart Avenue, as restrictions are present along these roads, and special agreement may need to be made before the heavy vehicle movements can occur. Discussions with TfNSW will also be held to confirm any TTM measures required along the NSW section of Parkwood Road, as this is not listed as a heavy vehicle route under NSW legislation. Given the similarity of the road's design to the ACT section, and its current use by heavy vehicles to and from the Tharwa Sands excavation, use of this road is not expected to be an issue.

For Fairlight Road, it is noted that the road width and horizontal geometry may be restrictive for allowing the construction and demolition heavy vehicle movements to occur. Discussions with relevant government authorities will be held to confirm whether use of this route is suitable, or whether the alternative route along Mountain Creek Road should be adopted. Development of TTMs to allow for heavy vehicles access to construction sites along Fairlight Road without impacting upon oncoming traffic may also be required, and discussions with someone qualified to undertake traffic control work would be required prior to permitting vehicle movements along this route.

It should be noted that all roads discussed above are already in use by Transgrid heavy vehicles for ongoing maintenance of the existing transmission lines (e.g. Lines 1 and 7). This further demonstrates that the key transit routes for the Proposal should be achievable for the Proposal's heavy vehicles.

11.4.3 Oversize / Overmass Vehicle Restrictions

None of the roads which construction or demolition traffic is expected to utilise are approved for use by oversize overmass (OSOM) vehicles. Once the need, sizing, and frequency of any OSOM vehicles to be used as part of Proposal construction and demolition is confirmed, discussions with relevant government authorities will be undertaken to confirm suitable routes for their use, along with the required warning and safety measures required to accompany these vehicles.

11.4.4 Cumulative Impacts

Cumulative traffic impacts associated with construction and demolition works as part of the Proposal could occur if the areas of Strathnairn and Macnamara along the western boundary of the Ginninderry development are constructed concurrently to the Proposal (these areas are currently planned for development in 2023–2032 (Ginninderry, 2022)), or if the Territory Battery project, which is proposed on Block 1634 Belconnen, is constructed at the same time (in 2025–2026). Cumulative traffic impacts could cause increased traffic congestion and disruption to local residents and businesses.

As noted in **Section 11.3.2**, all roads except Pro Hart Avenue are expected to be operating within their theoretical capacity volumes and with acceptable levels of congestion and significant spare capacity during the Proposal's construction and demolition periods. It is therefore possible that cumulative congestion impacts on the local road network would be minor. However, cumulative congestion impacts on Pro Hart Avenue could be more noticeable as this road is predicted to have baseline levels of congestion during peak morning and afternoon peaks. Heavy vehicle movements during Proposal construction and demolition will avoid these peak periods where practicable.

Cumulative impacts would be unlikely to occur during Proposal operation due to the extremely small number of vehicles needed for Proposal maintenance.

11.4.5 Construction of New Access Tracks

As discussed in **Section 2.3**, access tracks for the construction of new towers will utilise existing farm tracks for the most part. Some upgrades may be required for heavy vehicle access, including the placement of gravel in low lying and wet areas, and some widening or formalisation. Upgrades for heavy vehicle access that are not required for ongoing maintenance of the lines, and that the landholder does not want to retain would be removed and restored back to standard farm track condition.

It is not proposed that access tracks would be completely revegetated, as they will need to remain trafficable for maintenance and emergency access.

New access tracks will not need to be established for the demolition of any towers, as access is already in place from the original line construction, and ongoing maintenance activities along the easement. The vehicles required for dismantling the towers would not require any track upgrades, and the short temporal nature of the action, and low intensity (maximum 3 light vehicles, and 2 heavy vehicles) would not result in any permanent damage.

11.5 Mitigation and Management Measures

The key transit routes which are expected to be utilised by Proposal construction and demolition traffic are all expected to be operating with enough spare traffic capacity to effectively handle this increase in vehicles. The one exception is Pro Hart Avenue, which is expected to be operating just over capacity in 2026, without the Proposal construction and demolition traffic. However, the level of increase in traffic volumes from Proposal construction and demolition works are expected to be minor, and no worsening in congestion along Pro Hart Road is expected. Additionally, heavy vehicles accessing the Proposal Area will be spaced evenly throughout the day where possible. Any road closures required for the construction or demolition of the Proposal would be short term in nature, and managed to minimise traffic disruption through a TMP.

Any minor traffic disruption impacts will be managed through the implementation of a TMP. The TMP will be a sub-plan to the CEMP and involve standard traffic controls such as:

- Identification and documentation of the approved heavy vehicle access route to be used by heavy vehicles. Approved access routes to be communicated to transport companies prior to delivery of equipment and materials.
- Demarcation and documentation of site access roads, internal access tracks, and parking for construction workers, with this information to be included in site inductions.
- Signage to be placed along major roads to warn drivers of construction work and vehicles entering and exiting the Proposal Area.
- Notifying local residents and businesses (e.g. LMWQCC) of potential traffic disruptions, providing details such as the expected dates and timing of the disruption and the nature of the disruption (e.g. lane closures or short term road closures for conductor stringing/destringing). Deliveries will be scheduled to occur outside of peak periods where practicable.

The TMP will be implemented by qualified personnel from either the construction contractor or a separate temporary traffic management company. It will include procedures for monitoring the effectiveness of traffic controls, and be adaptive and able to be updated in response to the identification of any inadequate controls.

Once the type and number of Proposal construction and demolition transport vehicles has been confirmed during detailed design, the GJV will discuss any management or controls needed on transit routes to ensure that the heavy vehicles can safely travel along these roads. In particular, the following road authorities will be engaged:

- ACT City Services will be consulted to determine whether special permission is required to use Uriarra Road, given that this road is currently primarily used by heavy vehicles associated with just forestry and livestock. ACT City Services will also be consulted in relation to the use of Pro Hart Avenue, specifically the section which is not part of the approved heavy vehicle network.
- ACT City Services and TfNSW will be consulted to confirm whether access via Fairlight Road is suitable for the Proposal's heavy vehicles, or if other roads need to be utilised to avoid the bridge at Uriarra Crossing. Any TTM measures required to manage heavy vehicle movements will also be determined in collaboration with these agencies.
- TfNSW will be consulted to confirm whether special permission and/or any TTM measures are required along the NSW section of Parkwood Road, as this road is not listed as a heavy vehicle route under NSW legislation.

The traffic controls will be implemented in conjunction with soil and dust management controls associated with vehicle movements throughout the Proposal Area. For example, all loads will be covered to ensure that no materials or dust are lost from moving vehicles. Refer to **Section 6.5.1** and **Section 12.5.1** for more information on soil and dust management, respectively. As part of the CEMP, pest and weed management and appropriate waste disposal measures will also be implemented to manage the risk of litter and other pollutant dispersal from construction and demolition traffic and potential impacts on biodiversity.

Implementation of the TMP will also assist with managing potential cumulative traffic disruption impacts associated with construction and demolition works as part of the Proposal. The GJV will liaise with Ginninderry and other nearby developers to minimise potential cumulative traffic disruption impacts on local road users.

Any feedback from the community relating to traffic management will be communicated to the GJV through a complaints handling procedure as documented in the CEMP. Details regarding the design of the Proposal Area access points and the new site access roads will be determined during detailed design and communicated to construction personnel during site inductions and toolbox talks.

Additional consultation will be undertaken with rural landholders and land managers prior to construction and demolition activities to confirm access track locations, and document any requirements for their use, timing restrictions or rehabilitation.

11.6 Residual Risk Assessment

The residual risk assessment in **Table 11.6** provides revised risk ratings with consideration of the mitigation and management measures discussed in **Section 11.5**. The residual risk ratings range from negligible to medium, with all risks able to be reduced to ALARP. A significant residual risk remains for TTM measures implemented during construction that are unsuitable and result in near miss incidents, crashes, injuries or death. Although the likelihood of this occurring is remote, the consequence is catastrophic due to the potential for loss of life. This risk will be managed by qualified traffic management staff engaged by the GJV to implement the temporary traffic management measures during construction and decommissioning.

Table 11.6 Residual Assessment of Risks Associated with Traffic and Transport

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Construction								
T1	Increased volumes of construction and demolition traffic on local roads, construction of Proposal access tracks, and stringing/destringing of conductors over public roads result in traffic disruptions to residents and other road users, or damage to road surfaces.	Low	No	• Construction and demolition will be restricted to: o Monday to Friday: 7 am to 6 pm. o Saturday: 7 am to 1 pm. • Heavy vehicles accessing the Proposal Area will be spaced evenly throughout the day where possible. • Any road closures or changed traffic conditions to be minimised and timed to not interact with busy periods. • Industry best practice CEMP will be implemented that includes a TMP for mitigating and managing traffic impacts, including controls such as: o Local residents and businesses to be notified of potential traffic disruptions, with details such as the expected dates and timing of the disruption and the nature of the disruption to be provided. o Approved heavy vehicle access route to be documented and communicated to transport companies prior to delivery of equipment and materials o The site access roads, access tracks and parking for construction workers are to be documented and demarcated on site, and included in site inductions and toolbox talks.	Unlikely	Minor	Very low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				• Any damage to road surfaces resulting from construction/demolition traffic would be rehabilitated appropriately.				
T2	Temporary traffic management measures implemented during construction and demolition are not suitable and result in near miss incidents, crashes, injuries or death.	High	No	• The CEMP will include a TMP with traffic management controls such as: o Signage to be placed along major roads to warn drivers of construction work and vehicles entering and exiting the Proposal Area. • The TMP will be implemented by qualified personnel from either the construction company or a separate temporary traffic management company. • The TMP will be adaptive and able to be updated in response to the identification of any inadequate traffic management controls. • The TMP will include procedures for monitoring the effectiveness of controls in an effort to identify any inadequate controls prior to any incidents occurring. • The CEMP will include a complaints handling procedure for ensuring that any feedback from the community, such as any relating to traffic management, can be communicated to the GJV for integration in the CEMP and sub-plans.	Remote	Catastrophic	Medium	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
T3	Uncontrolled access by construction and demolition vehicles leads to dispersal of litter or other pollutants, damage to habitats or areas to be retained, and spread of weeds within the Proposal Area and/or areas outside the Proposal Area.	Medium	Yes	• The CEMP will include controls such as: o No-go zones, site boundaries and fences to be established to prevent unauthorised access into areas adjacent to the Proposal Area. o The site access roads, access tracks and parking for construction workers are to be documented and demarcated on site. o All contractors to be informed of the Proposal Area boundary and relevant approval conditions prior to commencing construction during site inductions, and reminded during toolbox talks. o Pest and weed management and the inclusion of appropriate waste disposal. Refer to the mitigation measures for B9 (**Section 5.7**) for further detail.	Unlikely	Minor	Very low	Yes
T4	Construction of access tracks results in unanticipated vegetation clearance.	Medium	No	• Existing access tracks will be used for demolition activities. No additional clearing permitted. • Existing access tracks will be used for construction where marked on maps, with widening and formalisation only to occur where required for heavy vehicle access. • Construction of access tracks will be subject to erosion and sediment control, weed management, and rehabilitation where appropriate. • Additional consultation will be undertaken with rural landholders and land managers prior to construction and demolition activities to confirm	Unlikely	Moderate	Low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				access track locations, and document any requirements for their use, timing restrictions or rehabilitation.				
T5	Cumulative traffic congestion impacts occur as a result of the Proposal and other developments in the region	Low	Yes	• The CEMP will include a TMP with controls for managing traffic associated with construction and demolition works as part of the Proposal (see mitigations provided for T1). • The head construction contractor will liaise with Ginninderry and any other nearby developments and businesses to minimise potential cumulative traffic disruption impacts on local road users where practicable.	Possible	Minor	Low	Yes
Operation								
T6	Increased volumes of maintenance traffic on local roads result in traffic disruptions to residents and other road users.	Negligible	Yes	• The TMP will include controls for management traffic associated with operation (maintenance) of the Proposal (see mitigations provided for T1).	Unlikely	Minimal	Negligible	Yes

12.0 Air Quality and Climate Change

Chapter Summary
This chapter provides an assessment of potential air quality and climate change impacts associated with construction of the Proposal.

12.1 Preliminary Risk Assessment

An assessment of Proposal risks associated with climate change and air quality is provided in **Table 12.1**. The risk ratings range from very low to medium, with a significant impact possible from cumulative air quality impacts caused by construction of the Proposal and other nearby developments.

Section 12.2 to **Section 12.4** provide a detailed assessment of these risks. The residual risk assessment in **Section 12.5.3** provides revised ratings for each risk based on the mitigation and management measures described in **Section 12.5**.

Table 12.1 Preliminary Assessment of Risks Associated with Climate Change and Air Quality

ID	Risk Scenario	Preliminary Risk Assessment			
		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Construction					
CC1	Construction activities result in impacts on air quality (e.g. from vehicle and dust emissions), reducing local amenity and potentially resulting in community complaints and non-compliance with the EP Act.	Possible	Minor	Low	No
CC2	Cumulative air quality impacts occur as a result of Proposal construction activities and other developments in the region.	Possible	Moderate	Medium	No
CC3	Opportunities to minimise greenhouse gas emissions during procurement and construction of the Proposal are not considered, leading to a greater contribution to climate change from the Proposal.	Possible	Minimal	Very low	No

12.2 Investigations

A qualitative assessment has been undertaken to assess potential air quality and climate change impacts associated with the Proposal. Existing air quality and climatic conditions were characterised for the Proposal Area using data from the nearest ACT Government air quality monitoring station and BoM weather station, respectively. Potential air quality impacts were identified using government-issued papers relating to dust and vehicle emissions, while climate change impacts, caused by greenhouse gas emissions, were informed by Representative Concentration Pathway 8.5 from CSIRO's Australian Climate Futures (CSIRO, 2021a). This represents a worst-case emissions scenario and is therefore a conservative prediction for climate projections.

12.3 Existing Conditions

12.3.1 Ambient Air Quality

Land surrounding the Proposal Area is a mixture of rural, urban and industrial, with river corridor and rural land uses dominating the landscape. Current sources of air pollution would generally be attributed to localised vehicle traffic, which would predominately emit carbon monoxide, nitrogen oxides (NO_x), sulfur dioxide (SO_2), volatile organic compounds (VOCs) such as benzene, and particulate matter such as soot. Vehicles travelling along unsealed roads, such as those on rural properties or construction sites (e.g. at Ginninderry), may also generate dust. The LMWQCC would also generate odours from time to time.

The ACT has three air quality monitoring stations. The closest station to the Proposal Area is at Florey, Belconnen, approximately 4.5 km to the east. This station measures a range of air quality parameters including CO, nitrogen dioxide, ozone, and particulates ($PM_{2.5}$ – fine particulate matter, and PM_{10} – coarse particulate matter).

EPA data from 2018–2023 show that air quality is generally very good for each of these parameters, based on the Air Quality Index which indicates how clean the air is (ACT Health, 2023). A notable exception was an increase in particulate matter and ozone between November 2019 and February 2020, which coincided with the catastrophic 'Black Summer' bushfire event. Fine particulate matter also appears to increase slightly around May-August each year, which could be attributed to wood smoke from residential wood heaters and/or hazard reduction burns.

Air quality within the Proposal Area and surrounds is expected to be higher than that measured at the Florey air quality monitoring station, due to the smaller road network in the area, fewer vehicles, and therefore lower vehicle emissions and lower density of rural residences.

12.3.2 Sensitive Receivers

Sensitive receivers located within 2 km of the Proposal Area include utility infrastructure such as the LMWQCC and transmission substations, businesses such as Canberra Sand and Gravel, rural homesteads, and residential areas associated with the Ginninderry urban area. As shown in **Table 12.2**, the closest receivers to the new alignment are industrial (Stockdill Substation and the LMWQCC), and the closest receivers to the lines being removed are suburban residences.

Table 12.2 Air Quality Sensitive Receivers within 2 km of the Proposal Area

Receiver	Location Relative to the Proposal	Type of Receiver
Stockdill Substation	The new alignments connect to existing towers at the Stockdill Substation.	Industrial, occupied only for maintenance
Canberra Substation	Line 7 would connect to the Canberra Substation, ultimately through Line 3C, replacing existing connections.	Industrial, occupied only for maintenance
LMWQCC	The LMWQCC is located at the western end of Stockdill Drive, adjacent to the new alignments.	Industrial, occupied by Icon Water staff during operating hours
Ginninderry urban area	The Ginninderry urban area being developed in both the ACT and NSW. Existing Lines 1 and 7 would be removed from within the future urban area.	Urban residences

Receiver	Location Relative to the Proposal	Type of Receiver
Shepherds Lookout, Wallaroo Spur, Scribbly Gum Lookout and Gruners Lookout	Scenic vantage points located along the Shepherds Lookout Walking Track, adjacent to Stockdill Drive near the new alignments. The lines to be removed pass over the walking track.	Open space / points of interest, occupied occasionally, more frequently on weekends
Canberra Sand and Gravel Landscape Centre	Canberra Sand and Gravel is a landscaping supply company. The facility is located adjacent to the lines to be removed.	Industrial
Residences	Urban residences are adjacent to the lines to be removed. Rural residences are located throughout the Proposal Area, generally closer to the new alignments than the existing lines.	Rural or urban

12.3.3 Existing Climatic Conditions

Canberra generally has a temperate climate with hot summers, dry autumns and cool winters. Rainfall can be highly variable across years. The closest BoM weather station to the Proposal Area is at the Canberra Airport, which is located approximately 20 km southeast of the Proposal Area. Key observations from this weather station averaged over the 15-year period from 2008 to 2023, are as follows (BoM, 2024).

- Annual mean maximum and minimum temperatures are 21.0°C and 6.8°C, respectively. January is typically the hottest month with a mean maximum of 30.2°C and highest recorded temperature of 44°C, while July is the coldest month with a mean minimum of 0.0°C and lowest recorded temperature of -8.7°C.
- The average number of days per year above 35°C is 11 days. Most of these extreme temperature days occur in January.
- Annual mean rainfall is 641.8 mm. November through March typically receive the most rain, with April through July receiving around half the monthly rainfall than the wetter months.
- The mean number of days per year with rainfall above 10 mm is 20 days. These wetter days typically occur in the warmer months through spring and summer.

The ACT Government recognises that the climate of Canberra is already changing and that extreme weather events will occur more frequently and with more intensity, particularly heatwaves, droughts, storms and bushfires. The ACT Climate Change Strategy 2019–25 states that more hot days (above 35°C) and fewer cold nights in the ACT region are already observed, with the hottest Canberra day in history recorded in January 2020 at 44°C in the Canberra City (ACT Government, 2019a).

12.4 Potential Impacts

Potential climate change and air quality impacts of the Proposal, as identified in the risk assessment in **Section 4.2** and summarised in **Section 12.1**, include:

- Reduced air quality from construction dust and vehicle/machinery emissions.
- Contribution to climate change due to greenhouse gas emissions.

These potential impacts are assessed in detail below.

12.4.1 Dust Emissions

Dust emissions would likely be generated during Proposal construction, including civil works (cutting, filling, site levelling and creation of new access tracks), removal of existing tower foundations, on-site vehicle movements, and mobilisation of dust from any uncovered stockpiles.

Dust emissions have the potential to cause adverse on- and off-site impacts if not properly managed. Coarse particulate matter (PM_{10}) is small enough to pass through the throat and nose and enter the lungs, while fine particulate matter ($PM_{2.5}$) can get deep into the lungs and into the bloodstream (NSW Health, 2020). Both can cause serious health effects depending upon the length and concentrations of exposure. Short-term exposure can lead to irritation of the eyes, nose and throat and exacerbation of pre-existing diseases such as asthma, while long-term exposure can lead to reduced lung function, development of cardiovascular and respiratory diseases, and a reduced life expectancy (NSW Health, 2020). However, as dust generated by the Proposal would be limited to construction and occur over staged development areas, exposure of receivers to dust would be limited.

Dust emissions also have the potential to impact on nearby ecosystems. Dust can settle onto plants and lead to reduced photosynthetic activity and loss of plant tissue, which in turn can impact animals that rely on these plants. Dust can also cause water quality impacts through increased sedimentation of nearby waterways. This is particularly critical for work in proximity to the river corridors. Refer to **Section 5.4.6.3** and **Section 7.4** for more information on potential ecological and water quality impacts of dust, respectively.

Cumulative air quality impacts on nearby receivers arising from dust could occur if additional ground disturbing activities occur in the local area during the Proposal's approximately 18-month construction program. The area of Ginninderry closest to the Proposal is planned for development in 2023–2032 (Ginninderry, 2022), and the proposed Territory Battery project is expected to be constructed in 2025–2026. Construction activities associated with Ginninderry and the Territory Battery, such as civil works, vehicle movements on unsealed roads and stockpiling, could generate dust at the same time as the Proposal, leading to cumulative dust impacts on nearby receivers.

The potential scale of dust emissions during Ginninderry construction would be more substantial than for the Proposal, as the 2023–2032 development area for Ginninderry would be around 400 ha, compared to the 10.9 ha of the Proposal's construction footprint. Removal of the existing lines is the component of the Proposal closest to Ginninderry. The construction footprint for this element of the Proposal is very small; limited to vehicle movements and removal of the existing towers.

Territory Battery has a smaller construction footprint than the Proposal (6.7 ha). However, the Territory Battery site is constrained to a single location and has the potential to have a more concentrated dust impact on nearby receivers than the Proposal, which is spread across an area tens of kilometres long.

The potential contribution of the Proposal to cumulative dust impacts would therefore be low in comparison to both these developments. No other development activities in the vicinity of the Proposal Area are known to be planned for the Proposal's construction period.

12.4.2 Vehicle Emissions

Vehicle exhaust emissions typically include a range of noxious chemicals including CO, NO_x, SO_2, VOCs and particulate matter. Traffic-related air pollution has been associated with a wide range of adverse health effects including exacerbation of respiratory issues, reduced lung function and increased risk of cardiovascular disease (CAR, 2017).

The transport sector is Australia's third largest contributor to carbon emissions (CSIRO, 2021b). The burning of petrol and diesel releases greenhouse gases into the atmosphere, including carbon dioxide, nitrous oxide and methane. Greenhouse gases contribute to global warming and impacts associated with climate change.

Vehicle movements and the operation of machinery during construction of the Proposal would lead to small, localised increases in greenhouse gas emissions. In turn, this would contribute to climate change, but the small scale of the Proposal means that greenhouse gas emissions and climate change impacts would be negligible. As discussed in **Section 11.4.1**, a maximum of nine vehicles per hour would be expected to access the Proposal Area during construction from five key transit routes: Pro Hart Avenue, Stockdill Drive, Uriarra Road, Fairlight Road and Parkwood Road.

As discussed in **Section 12.4.1**, cumulative air quality impacts on nearby receivers could occur during Proposal construction as a result of concurrent construction activities at the Ginninderry and Territory Battery development sites. Considering the relative scale and location of the various developments, the contribution of the Proposal to cumulative vehicle emission impacts would be low.

12.4.3 Climate Change

Greenhouse gas emissions from vehicles and machinery during Proposal construction would contribute to global warming, particularly from heavy vehicles used for transporting large equipment (e.g. transmission tower structures, cable drums) to and from the Proposal Area. Vegetation removal and electricity sourced from fossil fuels used to create the Proposal infrastructure (embodied energy) are also climate change drivers.

Sources of greenhouse gas emissions from the Proposal would include:

- Combustion of fuel in vehicles and on-site machinery (direct emissions occurring on site).
- Vegetation clearing (direct emissions from the decomposition of vegetation and soil carbon releases and the reduced conversion of atmospheric carbon dioxide into oxygen).
- Disposal of waste materials throughout the construction of the Proposal (indirect emissions from the decomposition of waste material, occurring off-site at waste disposal facilities).
- Indirect emissions associated with the embodied energy of construction materials such as cement and steel and Proposal infrastructure (the energy and resources that were consumed to produce the material/equipment).

Changes expected to the climate in the Canberra region include (CSIRO, 2021a):

- Increased average daily minimum and maximum temperatures by 0.6–2°C, with the number of >35°C days increasing an additional 1–5 days by 2030 and 10–20 days by 2070.
- Increased variability in mean rainfall depending on the season, with a predicted change to rainfall varying between -19% and +28% in summer and -12% and +48% in autumn by 2030, and a predicted change of -9% to -54% in autumn by 2070.
- Increased extreme rainfall events, with a 10% increase in rainfall intensity for every 1°C increase in air temperature.
- Increased average Forest Fire Danger Index.

The Proposal would contribute to the above climate change impacts. Although the small scale of the Proposal means that the contribution of the Proposal to climate change would be negligible, the cumulative impacts of construction projects contribute nationally to climate change. Greenhouse gas emissions of the Proposal will be actively managed through a range of mechanisms to minimise the contribution of the Proposal to national emissions, as discussed in **Section 12.5.3**.

Increased extreme weather events associated with climate change could also impact physically on Proposal infrastructure as follows (CSIRO, 2021a):

- Reduce transmission line performance as a result of increased average air temperature and extreme weather events (days >35°C).
- Damage to infrastructure caused by increased extreme wet weather and unprecedented flooding.
- Damage to infrastructure from an increased risk of bushfire.

In addition, climate fluctuations can result in changes to human behaviour and energy consumption which may have implications on the reliability of the national energy market and its hardware, including transmission lines.

12.5 Mitigation and Management Measures

The CEMP will detail the measures that will be implemented to mitigate and manage potential air quality impacts of the Proposal during construction. As these impacts are interrelated and linked with climate change, many of the measures described below will contribute towards mitigating multiple impacts of the Proposal. To mitigate potential cumulative impacts, the construction schedule will be shared with developers in the vicinity of the Proposal Area who will be undertaking ground disturbing activities at the same time as Proposal construction, to identify staging opportunities to minimise concurrent emissions.

12.5.1 Dust Emissions

The CEMP will specify measures for minimising dust emissions during Proposal construction, including:

- Civil works to be staged to minimise areas of exposed soil, where practicable.
- Site to be rehabilitated/revegetated as soon as possible following construction and progressively throughout construction.

- Silt and other materials to be removed from around the sediment and erosion control structures (see **Section 6.5.1**) to prevent the deposits from becoming a dust source.
- Vehicle speeds to be limited on any unsealed/non-gravelled areas.
- Trucks to be covered when transporting dry earth material such as spoil.
- Site entrances to be cleaned as needed to prevent the build-up of soil that could become airborne.
- Dust generating activities to cease during high winds until dust suppression can be undertaken.
- Dust suppression to be used on exposed soil and/or stockpiles to control any visible dust plumes. Water or similar (e.g. Spraygrass) would be used. Refer to **Section 6.5.1** for further information on spoil management.

The air quality control measures will be prepared in accordance with the EP Act. The mitigation and management measures identified in the CEMP (such as those listed above) will also be consistent with various ACT guidelines and policies including:

- Air EPP (Environment ACT, 1999)
- Environment Protection Guidelines for Construction and Land Development in the ACT (EPA, 2011)
- Guidance for dust suppression during construction (EPA c, n.d. a)
- Guidance for delivering supplies to building sites (EPA a, n.d.).

12.5.2 Vehicle Emissions

The CEMP will specify measures for minimising emissions from vehicles and machinery during construction of the Proposal, including:

- Vehicles and machinery to be switched off when not in use to avoid idling and reduce air emissions.
- Vehicles and machinery to use fuels as per the requirements of the Commonwealth *Fuel Quality Standards Act 2000* and Fuel Quality Standards Regulations 2019 as accessible (e.g. for diesel a sulfur content of less than 10 parts per million is stipulated), and be fitted with appropriate emission control equipment, maintained frequently, and serviced in accordance with manufacturer specifications.
- Only machinery that complies with relevant emissions standards to be used on site.
- Heavy vehicles to be serviced off site, unless an unexpected failure occurs while in operation on site. Any emissions filters or catalytic converters are to be tested for integrity. If found to be defective, they are to be replaced prior to equipment use on site.
- Locally sourced materials to be used where possible to reduce transport vehicle fuel use and emissions.

12.5.3 Greenhouse Gas Emissions

The GJV / Transgrid will implement the following measures to minimise greenhouse gas emissions of the Proposal:

- Construction services and materials to be procured locally where possible, to minimise the distance travelled and therefore emissions of vehicles accessing the site.

- Materials used during construction to be selected with a view of reducing the embodied energy of the products.
- Energy-efficient work practices to be implemented where possible, such as switching off construction plant, vehicles and equipment when not in use to minimise idling and reduce air emissions.
- Vegetation clearance to be limited to the minimum that is required for the Proposal.
- Cleared vegetation to be disposed of at a registered compost facility in the Canberra region. Vegetation will not to be sent to landfill or burnt.
- Measures for additional emissions mitigation to be identified during site inductions, training and pre-start talks.

12.6 Residual Risk Assessment

The residual risk assessment in **Table 12.3** provides revised risk ratings with consideration of the mitigation and management measures discussed in **Section 12.5**. The residual risk ratings range from negligible to low, with all risks able to be reduced to ALARP. No significant residual risks are predicted to occur.

Table 12.3 Residual Assessment of Risks Associated with Climate Change and Air Quality

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Construction								
CC1	Construction activities result in impacts on air quality (e.g. from vehicle and dust emissions), reducing local amenity and potentially resulting in community complaints and non-compliance with the EP Act.	Low	No	• Industry best practice CEMP will include measures for mitigating and managing potential air quality impacts caused by dust emissions, such as o Civil works to be staged to minimise areas of exposed soil, where practicable. o Silt and other materials to be removed from around any sediment and erosion control structures to prevent the deposits from becoming a dust source. o Vehicle speeds to be limited on any unsealed/non-gravelled areas. o Trucks to be covered when carrying dry earth material such as spoil. o Site entrances to be cleaned as needed to prevent the build-up of soil that could become airborne. o Dust generating activities to cease during high winds until dust suppression can be undertaken.	Unlikely	Minimal	Negligible	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				○ Dust suppression to be used on exposed soil and/or stockpiles to control any visible dust plumes. Water or similar (e.g. Spraygrass) would be used. Refer to the mitigation measures provided for S1 (**Table 6.3**, **Section 6.6**) for further information about spoil management. • The CEMP will include measures for mitigating and managing potential air quality impacts caused by vehicle / machinery emissions, such as: ○ Vehicles and machinery to be switched off when not in use to avoid idling and reduce air emissions. ○ Vehicles and machinery to use fuels as per the requirements of the *Fuel Quality Standards Act 2000* and Fuel Quality Standards Regulations 2019 as accessible, and be fitted with appropriate emission control equipment, maintained frequently, and serviced in accordance with manufacturer specifications. ○ Only machinery that complies with relevant emissions standards to be used on site.				

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				o Heavy vehicles to be serviced off site, unless an unexpected failure occurs while in operation on site. Any emissions filters or catalytic converters are to be tested for integrity. If found to be defective, they are to be replaced prior to equipment use on site. o Locally sourced materials to be used where possible to reduce transport vehicle fuel use and emissions.				
CC2	Cumulative air quality impacts occur as a result of Proposal construction activities and other developments in the region	Medium	No	• The CEMP will include measures for mitigating and managing potential air quality impacts caused by vehicle / machinery emissions and dust emissions (refer to specific mitigations listed for CC1). • The Proposal's construction schedule will be shared with developers in the vicinity of the Proposal Area who will be undertaking ground disturbing activities at the same time as Proposal construction (e.g. Ginninderry and Neoen for the Territory Battery), to identify staging opportunities to minimise concurrent emissions.	Unlikely	Moderate	Low	Yes
CC3	Opportunities to minimise greenhouse gas emissions during procurement and construction are not considered, leading to a greater	Very low	No	• The CEMP will include measures for mitigating and managing vehicle / machinery emissions that would contribute to climate change (refer to specific mitigations listed for CC1).	Unlikely	Minimal	Negligible	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
	contribution to climate change from the Proposal.			• In addition, the GJV / Transgrid will implement the following measures to minimise the Proposal's contribution to climate change: o Construction services and materials to be procured locally where possible, to minimise the distance travelled and therefore emissions of vehicles accessing the site. o Materials used during construction to be selected with a view of reducing the embodied energy of the products. o Energy-efficient work practices to be implemented where possible, such as switching off construction plant, vehicles and equipment when not in use to minimise idling and reduce air emissions. o Vegetation clearance to be limited to the minimum that is required for the Proposal. o Cleared vegetation to be disposed of at a registered compost facility in the Canberra region. Vegetation will not to be sent to landfill or burnt. o Measures for additional emissions mitigation to be identified during site inductions, training and pre-start talks.				

13.0 Materials and Waste

Chapter Summary
This chapter addresses on-site material use and waste generation associated with construction, operation and decommissioning of the Proposal. It details the waste management strategies to be implemented in accordance with the waste management hierarchy (avoid, reduce, reuse, recycle), drawing on the mitigation and management measures discussed in relation to soils, contamination and water quality in **Chapter 6.0** and **Chapter 7.0**.

13.1 Preliminary Risk Assessment

An assessment of Proposal risks associated with material use and waste generation is provided in **Table 13.1**. No significant impacts are anticipated, with the risk ratings ranging from very low to low.

Section 13.2 to **Section 13.5** provide a detailed assessment of those risks. The residual risk assessment in **Section 13.7** provides revised ratings for each risk based on the mitigation and management measures described in **Section 13.6**.

Table 13.1 Preliminary Assessment of Risks Associated with Material Use and Waste

ID	Risk Scenario	Preliminary Risk Assessment			
		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Construction					
M1	Waste materials produced during construction of the Proposal are not stored or managed such that environmental risks are minimised.	Possible	Minor	Low	No
M2	Excessive amounts of resources used during Proposal construction lead to high volumes of waste to be disposed of.	Unlikely	Minor	Very low	No

13.2 Investigations

A qualitative assessment has been undertaken to assess potential resource use and waste generation impacts associated with the Proposal. Potential waste sources and resource streams were first identified for construction of the Proposal. Appropriate mitigation and management measures were then identified in accordance with the waste management hierarchy (avoid, reduce, reuse, recycle).

13.3 Policy Context

The ACT Waste Management Strategy 2011–2025 sets a clear direction for waste management in the ACT to achieve full resource recovery and a carbon neutral waste sector (ESDD, 2011). This goal is supported by four outcomes and a range of strategies. As shown in **Table 13.2**, the Strategy recognises waste as a resource from which value can be gained by transforming the waste into valuable products (ESDD, 2011).

The Strategy aims to reduce waste generation in the ACT while obtaining value from waste through recovery and energy generation, and managing and offsetting waste to protect the environment.

Table 13.2 Outcomes and Targets in the ACT Waste Management Strategy 2011–2025 (ESDD, 2011)

Outcome	Targets
1. Less waste generated	• The growth in ACT waste generation is less than the rate of population growth. • Reuse of goods expands in the ACT.
2. Full resource recovery	• The rate of resource recovery increases: o Over 80% by 2015. o Over 85% by 2020. o Over 90% by 2025.
3. A clean environment	• ACT leads Australia in low litter and incidents of illegal dumping. • ACT's natural resources are protected and, where feasible, enhanced through waste management.
4. Carbon neutral waste sector	• The ACT waste sector is carbon neutral by 2020: o Energy generated from waste doubles by 2020. o Waste resources are recovered for carbon sequestration by 2020.

The Strategy describes a waste management hierarchy aimed at extracting the maximum practical benefits from products while generating the minimum amount of waste (ESDD, 2011). As shown in **Plate 13.1**, the hierarchy requires that waste be avoided in the first instance (reduce and reuse), alternative uses be found for any waste (recycle and recover), and that waste be disposed of as a last resort (landfill).

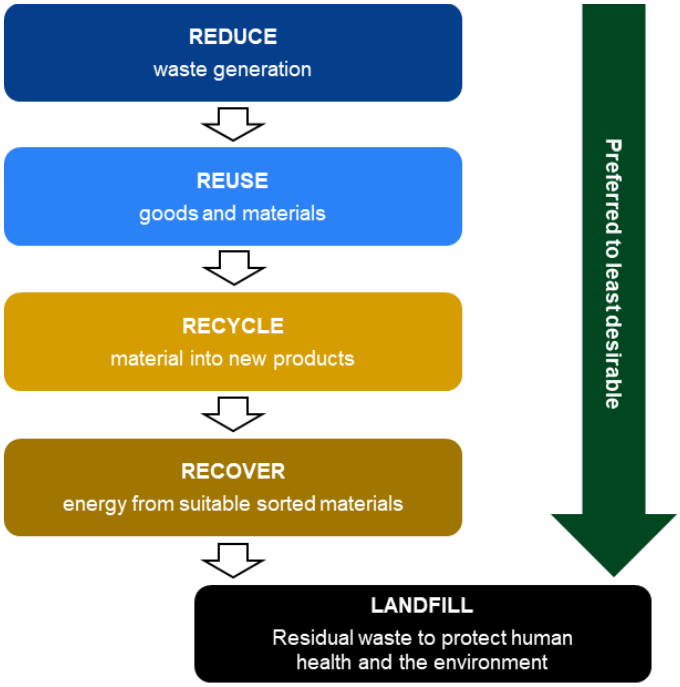


Plate 13.1 ACT Waste Management Hierarchy (ESDD, 2011)

13.4 Existing Conditions

In its current condition, the Proposal Area would produce minimal waste. The new alignments are located on land managed for either rural purposes (grazing) or conservation (managed by PCS), with the Stockdill Substation property used for the utility installation and managed by Transgrid. The transmission lines to be removed are located across rural landholdings, conservation land, and within the Ginninderry FUA.

The Proposal Area covers a total area of approximately 75.2 ha, of which only 10.9 ha would be impacted during construction. The Proposal would utilise a range of different resources and generate a number of different waste types throughout its construction. As outlined in **Table 13.3**, materials likely to be generated by the Proposal would range from natural materials such as soil and green waste to processed products such as transmission infrastructure from demolition and new equipment packaging.

Table 13.3 Materials Likely to be Generated by the Proposal

Material	Source	Description
Transmission infrastructure and foundations	Demolition of part of the existing Lines 1 and 7	A total of 27 steel towers and 36.9 km of electrical cabling would be removed from Lines 1 and 7, including partial removal of the concrete foundations (to 1 m below ground level or 1 m above ground, depending on landholder requirements; see **Section 2.3.3**). In addition, three earthing cables and one earthing/optical fibre cable would be removed.
Spoil	Civil works including excavation and site levelling	Soil would be removed from the Proposal Area during excavation of the new tower footings and where site levelling is needed for access tracks or other construction areas.
Green waste	Vegetation removal associated with civil works	Civil works associated with Proposal construction would involve the removal of existing vegetation, with all vegetation to be removed from the new tower locations, and trees above 6 m tall to be removed along the transmission line easements and vegetation clearance zone. Refer to **Section 5.4.1** for more information on vegetation loss associated with the Proposal.
Packaging	Equipment packaging	Some equipment would be transported to site in packaging for protection against damage. The packaging would likely contain a mix of cardboard, paper, plastic and metal components that would not remain on site.
Human rubbish and waste	Construction personnel	Personnel involved in construction of the Proposal would bring food and bottled water to site, which would generate packaging and scraps once consumed. Human waste would also be generated at the onsite construction compounds via temporary toilets (permanent toilets and sewerage facilities are not being proposed as there would be no permanent staff on site once the Proposal is operational).

13.5 Potential Impacts

Potential material and waste impacts of the Proposal, as identified in the risk assessment in **Section 4.2** and summarised in **Section 13.1**, include:

- Environmental damage from inappropriately stored or managed waste.
- High volumes of waste generated from excessive material usage.

The Proposal would generate a range of different waste types including transmission infrastructure (e.g. steel towers, electrical cabling and concrete foundations), spoil, green waste, packaging, and human rubbish and wastes (see **Table 13.3**). If not appropriately stored and managed, this waste could have a range of environmental and health impacts such as:

- Loose materials stockpiled on site, such as spoil or green waste, could be transported by stormwater or wind into nearby waterways or sensitive vegetation (e.g. BGW). This has the potential to impact ecosystems that rely on those habitats through water and soil contamination, smothering of vegetation, and sedimentation or blockage of waterways.
- Rubbish from food or equipment packaging could impact water quality (of groundwater or surface waterbodies), vegetation condition or soil condition if transported off site by stormwater or wind. Food scraps could also attract pests and other animals to site, leading to a spread of invasive species in the area and impacting the balance of existing ecosystems.
- Human waste could severely impact water quality (of groundwater or surface water bodies), vegetation condition or soil condition if transported off site by stormwater through leaching or spills. Human waste also poses a health and amenity risk to on-site personnel exposed to uncontained waste or odours.

Measures for minimising and managing waste generated by the Proposal and for avoiding the above potential impacts are discussed in **Section 13.6**.

13.6 Mitigation and Management Measures

Some waste generated by the Proposal will be able to be reused and recycled in accordance with the waste management hierarchy shown in **Plate 13.1**, but other waste will need to be disposed of to landfill. **Table 13.4** outlines the waste management strategies that will be implemented for each type of material identified in **Section 13.4**. Waste management procedures will be detailed in the CEMP to manage waste generated during Proposal construction.

Table 13.4 Waste Management Strategies to be Implemented for Each Material Type Generated by the Proposal

Material	Waste Management Strategies
Transmission infrastructure and foundations	• Transmission infrastructure being removed will be taken off-site as soon as practicable. If unable to be transported off site immediately, demolition material will be stored at the construction laydown areas until it can be removed from site. • The steel transmission towers removed from Lines 1 and 7 will be cut into pieces during demolition and transported off-site for recycling and repurposing. • The electrical cabling removed from Lines 1 and 7 will be stripped using Transgrid's steel separator, allowing the outer aluminium layer to be separated, collected and smelted into new products, and the steel core to be recycled. • Concrete removed from the Line 1 and 7 tower foundations will be reused or recovered at an ACT facility such as the Mitchell Resource Management Centre or ACT Recycling.
Spoil	• Any site levelling required (e.g. for access tracks, construction compounds or tower construction) will involve the preparation of detailed cut and fill design plans. These plans will aim to achieve a balance between cut and fill to minimise the generation of excess volumes of spoil that need to be transported off site for reuse or disposal.

Material	Waste Management Strategies
	• Soil excavated from site will be reused as fill where possible to minimise the volume of spoil that needs to be removed from site. Pre-construction soil testing will be done to identify soil that can be reused. • If any additional fill is required, either VENM would be imported, or clean construction fill used (in the case of the Ginninderry urban area). • Spoil will be managed in accordance with the ACT's Guideline for Stockpile Management (EPA, 2019) and guidance on spoil management (EPA f, n.d.). In particular, soil and rock will be disposed to landfill if unable to be reused off site. Fill, suspected contaminated material or building wastes will be segregated and stockpiled on site, and tested in accordance with the ACT's requirements for the reuse and disposal of contaminated soil (EPA e, n.d.) prior to reuse or disposal. • The CEMP will include a detailed ESCP (which builds upon the preliminary ESCP in **Appendix G3**) that documents the controls to be implemented for stockpile and spoil management. Refer to **Section 6.5.1** for the detailed list of controls that will be implemented.
Green waste	• The trees and other vegetated areas to be removed during construction will be clearly demarcated on site to avoid accidental clearance of any vegetation and excess generation of green waste. • Green waste will be disposed of at a green waste recycling facility. Green waste skip bins will be used on site during construction if required. • Any invasive weeds in the construction footprint will be managed using chemical and physical methods as appropriate, in accordance with the ACT Weeds Manual (Southern ACT Catchment Group, 2023). Weed management controls will be detailed in the CEMP. • The head construction contractor will provide instructions and training to construction staff on appropriate waste management procedures as detailed in the CEMP.
Packaging	• Packaging waste will be recycled where possible or disposed to landfill. The waste will be separated into waste streams as identified in the CEMP and recycled or disposed of accordingly. Skip bins will be used on site during construction, and regularly emptied. • The need to recycle materials where possible will be included in site inductions and reiterated in toolbox talks.
Human rubbish and waste	• Separate waste and recycling bins will be provided on site to allow for food waste to be recycled where possible. The need to recycle materials where possible will be included in site inductions and reiterated in toolbox talks. • Human waste will be captured in portable toilets on site during construction and emptied regularly. Portable toilets will not be available on site during the Proposal's operation as the site will not be manned.

13.7 Residual Risk Assessment

The residual risk assessment in **Table 13.5** provides revised risk ratings with consideration of the mitigation and management measures discussed in **Section 13.6**. The residual risk ratings are expected to be negligible, with all risks able to be reduced to ALARP. No significant residual risks are predicted to occur.

Table 13.5 Residual Assessment of Risks Associated with Materials and Waste

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Construction								
M1	Waste materials produced during construction of the Proposal are not stored or managed such that environmental risks are minimised.	Low	No	• Industry best practice CEMP will include controls for managing waste during Proposal construction, such as: o Waste will be managed in accordance with the waste management hierarchy shown in **Plate 13.1**, prioritising the reuse of materials where possible. o Transmission infrastructure being removed will be taken off-site as soon as practicable. If unable to be transported off site immediately, demolition material will be stored at the construction laydown areas until it can be removed from site. o Transmission infrastructure being removed will be reused, recovered or recycled wherever possible, including the steel transmission towers, electrical cabling and concrete foundations. o Spoil will be managed as follows: ▪ Soil excavated from site will be reused as fill where possible to minimise the volume of spoil that needs to be removed from site. Pre-construction soil testing will be done to identify soil that can be reused.	Unlikely	Minimal	Negligible	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				▪ Spoil will be managed in accordance with the ACT's Guideline for Stockpile Management (EPA, 2019) and guidance on spoil management (EPA f, n.d.). In particular, soil and rock will be disposed to landfill if unable to be reused off site. Fill, suspected contaminated material or building wastes will be segregated and stockpiled on site, and tested in accordance with the ACT's requirements for the reuse and disposal of contaminated soil (EPA e, n.d.) prior to reuse or disposal. ▪ The CEMP will include a detailed ESCP (which builds upon the preliminary ESCP in **Appendix G3**) that documents the controls to be implemented for stockpile and spoil management. Refer to S1 (**Table 6.3**, **Section 6.6**) for the detailed list of controls that will be implemented. o Green waste will be managed as follows: ▪ Green waste will be disposed of at a green waste recycling facility. Green waste skip bins will be used on site if required. ▪ Any invasive weeds in the construction footprint will be managed using chemical and physical methods as appropriate, in accordance with the ACT Weeds Manual (Southern ACT Catchment Group, 2023).				

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				▪ The head construction contractor will provide instructions and training to construction staff on appropriate waste management procedures as detailed in the CEMP. o Packaging waste will be recycled where possible or disposed to landfill. The waste will be separated into waste streams as identified in the CEMP and recycled or disposed of accordingly. Skip bins will be used on site during construction, and regularly emptied. o Separate waste and recycling bins will be provided on site to allow for food waste to be recycled where possible. The need to recycle materials where possible will be included in site inductions and reiterated in toolbox talks. o Human waste will be captured in portable toilets on site during construction and emptied regularly. • The head construction contractor will provide instructions and training to construction staff on appropriate waste management procedures as per the CEMP.				
M2	Excessive amounts of resources used during Proposal construction lead to high volumes of waste to be disposed of.	Very low	No	• Detailed design will involve the specification of transmission infrastructure which is needed for the new alignments. Only the required amounts of those materials will be ordered, with a small allowance for additional materials (e.g. conductors) as required. This will help to minimise the volume of materials that remain at the completion of construction which need to be managed.	Unlikely	Minimal	Negligible	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				• Detailed cut and fill design plans will aim to achieve a balance between cut and fill to minimise the generation of excess volumes of spoil that need to be transported off site for reuse or disposal. • The CEMP will document the approved disturbance area and identify controls for ensuring that the boundary is clearly demarcated on site using signage and exclusion fencing. This will help prevent excess generation of spoil. • Trees and vegetated areas to be removed will also be clearly demarcated on site to avoid accidental clearance of any vegetation and excess generation of green waste. • The CEMP will require waste to be managed in accordance with the ACT waste management hierarchy shown in **Plate 13.1**, thereby minimising the volumes of waste to be disposed of. • Site workers will be inducted into the CEMP and will be informed of the approved clearance boundaries. This will be reiterated during toolbox talks.				

14.0 Socio-economic

Chapter Summary
This chapter provides an assessment of potential social and economic impacts of the Proposal. It considers impacts that are solely related to social and economic matters, as well as social aspects of impacts relating to local amenity that have been assessed elsewhere in this EIS. Both adverse and beneficial impacts have been considered.

14.1 Preliminary Risk Assessment

An assessment of adverse social and economic risks of the Proposal is provided in **Table 14.1**. The risk ratings range from negligible to high, with significant impacts possible from a loss of local amenity, safety risks associated with construction and demolition traffic, or if unanticipated public comments are raised during the EIS process or once the Proposal is operational. The Proposal also has the potential to result in significant beneficial social and economic impacts due increased housing availability and improved amenity adjacent to the Ginninderry residential development.

Section 14.1 to **Section 14.4** provide a detailed assessment of these risks. The residual risk assessment in **Section 14.6** provides revised ratings for each risk based on the mitigation and management measures described in **Section 14.5**.

Table 14.1 Preliminary Assessment of Risks Associated with Social and Economic Matters

ID	Risk Scenario	Preliminary Risk Assessment			
		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Design					
SE1	Unanticipated public concerns or comments received during the EIS process results in rework, delays or public animosity.	Possible	Moderate	Medium	No
SE2	Siting of the Proposal results in a loss of agricultural land.	Unlikely	Minimal	Negligible	Yes
SE3	Impacts on human health and safety from exposure to electromagnetic fields (EMF) and frequencies associated with high voltage powerlines.	Unlikely	Major	Medium	No
Construction					
SE4	People in areas near the Proposal are exposed to increased levels of noise, vibration, dust emissions, lighting and/or traffic from construction and demolition activities, reducing local amenity and potentially resulting in community complaints, non-compliance with the EP Act and/or safety issues.	Possible	Catastrophic	Very high	No

ID	Risk Scenario	Preliminary Risk Assessment			
		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Operation					
SE5	Residents or landholders near the new alignments raise unanticipated or additional concerns to those raised during consultation in the development process, resulting in community complaints, public animosity and/or reputational risks.	Possible	Moderate	Medium	No
SE6	People in areas near the Proposal are exposed to increased levels of noise and reduced visual amenity once the Proposal is operational, reducing local amenity and potentially resulting in community complaints and non-compliance with the EP Act.	Likely	Moderate	High	Yes

14.2 Investigations

A desktop review using the 2021 Census data (ABS, 2021) was undertaken to identify existing socio-economic conditions in the Proposal Area and surrounding region. The impact assessment also considered community and stakeholder engagement activities undertaken for the Proposal, as described in **Chapter 16.0**, as well as the various investigations that were completed to assess potential amenity impacts of the Proposal. These studies, which have been discussed elsewhere in the EIS, include:

- LVIA (dsb Landscape Architects, 2024) – **Chapter 9.0**
- NVIA (Umwelt, 2024b) – **Chapter 10.0**
- TIA (Egis, 2024) – **Chapter 11.0**.

The results of these impact assessments were used to assess potential social impacts which may occur as a result of a loss of local amenity.

14.3 Existing Conditions and Values

14.3.1 Land Uses

The Proposal Area is a mixture of privately leased agricultural land and public land. The privately leased land is mostly undeveloped and managed with sheep grazing, except for the eastern part of the Proposal Area which is being developed for residential purposes and utility infrastructure. The public land is managed as nature reserve or other conservation areas (e.g. the GCC). All existing land uses would continue unchanged following construction of the Proposal, with minor disruptions associated with construction (e.g. temporary exclusion of stock from construction areas).

The landscape surrounding the Proposal contains a range of utility infrastructure which are prominent from various viewpoints, including the industrial LMWQCC, Stockdill Substation, other high voltage transmission lines and the proposed Territory Battery adjacent to the new alignments, and the Canberra Substation. There are also several high voltage and smaller transmission lines near the alignments to be removed.

Residents near the Proposal Area are scattered, primarily on rural properties, with Fairlight Station located in the centre of the Proposal Area, and other rural residences located along Fairlight Road and Mountain Creek Road to the west. Huntly Station is located to the south of the new alignments on Uriarra Road. Urban residences are located throughout the Ginninderry development near the Canberra Substation and Line 3C.

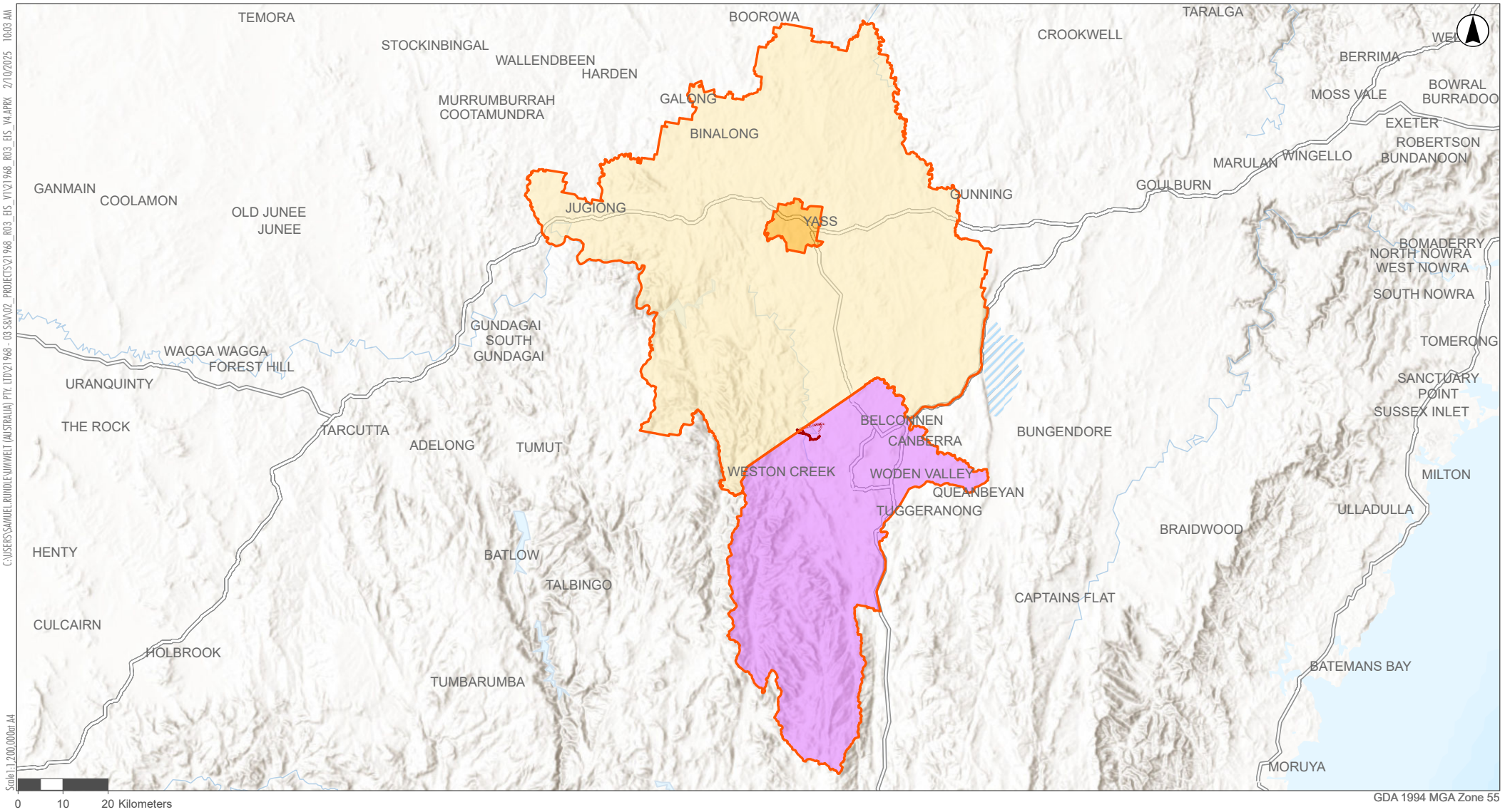
14.3.2 Demographics and Workforce

The Proposal is located in the northwest of the ACT, adjacent to the NSW border. It is expected that the Proposal would employ people from both the ACT and NSW. For the purposes of this socio-economic impact assessment, the study area is therefore considered to be the whole of the ACT and the Yass region of NSW (see **Figure 14.1**).

As shown in **Table 14.2**, the study area has a total population of 473,366. Of relevance to the Proposal, 17,707 people were employed in the construction industry in 2021 and 2,043 in the utility industry (electricity, gas, water and waste) (ABS, 2021). A total of 25,275 people were employed as technicians or trades workers; 6,425 people as machinery operators or drivers; and 13,120 people as labourers (ABS, 2021).

Table 14.2 Census 2021 Data Relevant to the Proposal Area (from (ABS, 2021))

Data Category	ACT	Yass and Yass Surrounds[1]
Description	The 'Unincorporated ACT' local government area (i.e. the whole of the ACT)	The township of Yass and the surrounding regional area, Statistical Areas Level 2
Population	453,890	19,476
Median age	35	42
Average people per household	2.5	2.6
Median weekly household income	$2,373	$2,157
Top three industries of employment	1. Public administration and safety (73,991) 2. Health care and social assistance (28,459) 3. Professional, scientific and technical services (27,120).	1. Public administration and safety (1,906) 2. Construction (1,184) 3. Health care and social assistance (983).
People employed in the construction industry	16,523	1,184
People employed in the electricity, gas, water and waste services industry	1,878	165
People employed in trade related occupations: • Technicians and trade workers • Machinery operators and drivers • Laborers.	42,212	2,608



Legend

- Proposal Area
- Study Area
- ACT
- Yass Surounds
- Yass

FIGURE 14.1

Study Area for the Socio-economic Impact Assessment

Image Source: Nearmap (2022) **Data source:** ACT Government (2023)

The ACT has an established trades and construction industry. Master Builders ACT reported that over $483 million of civil construction work was underway in the September 2023 quarter, including $93.6 million for electricity-related projects (Master Builders ACT, 2023). They reported that 13,728 people were employed in the construction industry in August 2023, representing 5.4% of ACT jobs, with 2,0985 construction apprentices as of December 2022 (Master Builders ACT, 2023). The ACT was home to 6,529 construction businesses in June 2022; most of which were sole traders (53%) or small businesses with less than 20 employees (45%) (Master Builders ACT, 2023).

14.4 Potential Impacts

Potential adverse socio-economic impacts of the Proposal, as identified in the risk assessment in **Section 4.2** and summarised in **Section 14.1**, include:

- Rework, delays, public animosity or reputational risk caused by unanticipated public concerns or comments received during the EIS process or once the Proposal is operational.
- Impacts on community interest or perceptions of the development from media attention and/or political interest.
- Loss of agricultural land.
- Reduced local amenity during Proposal construction and operation.
- Impacts on human health and safety from exposure to EMF and frequencies associated with high voltage powerlines.

The Proposal also has the potential for a range of beneficial socio-economic impacts associated with the following:

- Creation of additional residential lots, including lots specifically for affordable housing.
- Improved visual amenity due to the removal of existing Lines 1 and 7 near Ginninderry.
- Net reduction in transmission line maintenance costs.
- Enhances the resilience of the electricity network by removing a connection from the Stockill Substation (providing space for an additional connection to strengthen the network in the future).

These potential impacts are assessed below.

14.4.1 Adverse Impacts

14.4.1.1 Public Interest

The GJV has undertaken extensive targeted consultation and broader community engagement since 2020, including:

- Site walkovers and Aboriginal cultural heritage mapping with the ACT RAOs.
- Regular consultation and updates with all landholders impacted by the proposed realignment works including ACT, NSW and Australian Government agencies; and commercial and private landholders.
- Valuations of the proposed easements for the new alignments and offers of compensation to all affected landholders.

- Community updates about the Proposal to the Ginninderry Aboriginal Advisory Group, Ginninderry People and Place Group, Bush on the Boundary, ACT Government and the National Housing Finance and Investment Corporation.
- Two community drop-in information sessions in November 2024, targeting nearby ACT and NSW residents, respectively.
- Public exhibition of the EPBC Act referrals and this EIS.

The GJV has developed a needs-based approach for guiding the implementation of its stakeholder engagement strategy (see **Chapter 16.0**), which reflects the different needs and interests of the various stakeholder groups relevant to the Proposal.

The GJV believes that early and continuous consultation with the community will ensure that any concerns are raised early in the development process. This approach has helped to reduce the risk of receiving unanticipated feedback late in the EIS process or post-approvals, thereby minimising the risk of rework and delays.

Additionally, this risk is managed through the GJV's needs-based approach to stakeholder engagement (see **Chapter 16.0**), which stipulates the use of different mechanisms to engage with different stakeholder groups to ensure maximum dissemination of information, meaningful engagement, and the provision of opportunities for stakeholders to seek additional information. This also helps ensure transparency throughout the approvals processes and a high quality environmental impact assessment.

14.4.1.2 Loss of Agricultural Land

The Proposal would result in the loss of approximately 13.5 ha of grazing land along the new alignments (8.3 ha of which would be a temporary loss associated with construction areas such as laydown areas). Although this would reduce the area that the landholders can use for livestock grazing, the area lost is small in relation to the total size of the agricultural blocks (0.5% of 2,307.8 ha) and rural leases. The surrounding areas would continue to be available for grazing following completion of construction. Any loss of income associated with the loss of grazing land would be offset through the financial arrangements in place between the GJV and the landholders. The Proposal is therefore not expected to cause a loss of income to the landholders or to the broader economy.

14.4.1.3 Loss of Local Amenity

Increased levels of noise, vibration, dust emissions, lighting and traffic during construction of the Proposal, and loss of visual amenity during operation, may lead to a loss of local amenity. These risks have mostly been addressed in previous chapters of this EIS, so a summary impact assessment has been provided in **Table 14.3**. The most substantial local amenity impacts would likely be associated with a loss of visual amenity once the Proposal is operational. Potential noise, vibration, traffic, lighting and dust impacts would largely be limited to construction so would be short-term and low impact.

Table 14.3 Summary of Potential Local Amenity Impacts of the Proposal

Risk	Potential Social Impacts	EIS Reference
Noise and vibration	• Noise and vibration would be generated during Proposal construction, and noise may also be generated during operation from corona discharge. The Proposal may exceed noise standards under the EPR at several nearby urban and non-urban receivers, during both construction and operation. • The EPR contains clauses that exempt a development from meeting the noise standards if certain conditions are met. The Proposal would meet these conditions so would be exempt from complying with the EPR noise standards during standard work hours during construction. • Additionally, the noise predictions are conservative and assume all equipment is operating simultaneously. The noise predictions therefore represent an expected worst-case noise, which may only occur rarely or perhaps not at all. • In relation to noise during Proposal operation, the noise standards would be exceeded at five receivers during night-time and three receivers during day-time. However, the predicted exceedances are at the block boundaries and not at the actual residence location (except for some properties in Strathnairn). Although the EPR requires assessment at block boundaries, it is useful to know that operational noise impacts may only be experienced at residences in a single area (Strathnairn). • Ground-borne vibration also has the potential to reduce local amenity through the use of vibration-inducing equipment such as jackhammers during Proposal construction. However, no receivers are located close enough to the construction footprint where vibration impacts could occur, so no impacts are anticipated. • A CNVMP will be developed for the Proposal as a sub-plan to the CEMP. The CNVMP will contain controls for minimising noise and vibration generated during construction, consistent with AS 2436. Refer to **Section 10.5** for the full list of mitigation and management measures.	**Chapter 10.0**
Dust emissions	• Dust emissions would likely be generated during Proposal construction but are unlikely to occur during operation. Dust emissions have the potential to cause adverse on- and off-site impacts if they are not properly managed. Particulate matter can cause serious health effects depending upon the length and concentrations of exposure. As dust generation caused by the Proposal would be limited to construction activities, dust emissions would occur over a short timeframe and any exposure would be limited. A range of mitigation and management measures will be implemented to minimise dust generation, including staging of the civil works, construction vehicle speed limits on unsealed roads, and dust suppression on exposed soil and stockpiles. Refer to **Section 12.5.1** for the full list of control measures.	**Chapter 12.0**
Lighting	• Lighting would be limited to any periods of poor ambient light when safe work conditions during construction require artificial lighting. Lighting would be directed towards the Proposal Area and away from sensitive receptors so is unlikely to result in any amenity impacts.	**Chapter 9.0**

Risk	Potential Social Impacts	EIS Reference
Visual amenity loss	• The Proposal Area extends across a large area, and the new alignments would be visible from a range of viewpoints including points and routes of interest such as roads, public use areas and rural residences. The lines to be removed are currently also visible from urban residences. • Potential visual impacts of the Proposal were assessed to be low from a range of viewpoints that would have transitory views of the new alignments, such as Shepherds Lookout, parts of Stockdill Drive and rural properties including the Fairlight Residence. Viewpoints that may be subject to a high impact include Uriarra Road, Fairlight Road, the LMWQCC, and other sections of Stockdill Drive, where there are high visitation numbers and/or a high sensitivity to change (e.g. at the Uriarra Crossing picnic areas). • The Proposal has undergone substantial design iterations over the past several years to minimise adverse visual impacts where practicable. Several route options for the new alignments were initially considered, most of which were ruled out following consultation with relevant landholders, in part due to visual amenity concerns. The final Proposal design (as assessed in this EIS) was identified by these stakeholders as suitable for further consideration, demonstrating the effectiveness of the GJV's avoidance efforts. The residual adverse visual impacts therefore represent impacts that are generally considered acceptable to affected landholders and are unable to be further reduced without impacting landscape views (e.g. through the use of vegetation screening). • The Proposal would also have beneficial impacts on urban and rural residences located near the existing lines, which will no longer have views of transmission infrastructure once it is removed by the Proposal. Beneficial impacts are discussed further in **Section 14.4.2**.	**Chapter 9.0**
Traffic disruption	• The level of anticipated traffic (light and heavy vehicles) associated with Proposal construction and demolition can be comfortably accommodated on all key transit routes to the Proposal Area based on existing and predicted 2026 traffic levels (Stockdill Drive, Uriarra Road, Fairlight Road and Parkwood Road). However, Pro Hart Avenue is predicted to be operating above its traffic capacity in 2026 without the Proposal. Construction of the Proposal would result in the addition of up to 9 vph, which would have a negligible/unnoticeable impact on traffic congestion on all key transit routes, including Pro Hart Avenue. • All roads except for Fairlight Road are expected to be suitable for construction and demolition heavy vehicle use without significant management activities. The GJV will engage with relevant government authorities (e.g. ACT City Services) to confirm whether use of this route is suitable for the Proposal, or whether an alternative route is needed. TTMs will also be implemented to ensure that heavy vehicles can safely access the Proposal Area, which could involve traffic management such as reduced speed limits and traffic control that could cause disruption to local road users. Local residents and businesses will be notified of potential traffic disruptions, providing details such as the expected dates and timing of the disruption and the nature of the disruption. Deliveries will be scheduled to occur outside of peak periods where practicable.	**Chapter 11.0**

14.4.1.4 Exposure to Electromagnetic Fields

EMF are naturally occurring and found wherever there is electricity. EMF are an essential part of the electricity process, causing energy to be transferred along electric wires. Carbon Neutral Delivery Partners (CNDP) conducted an EMF assessment to identify potential safety impacts from EMF and related risks.

The International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines for Limiting Exposure to Electromagnetic Fields (ICNIRP, 2020) express limits in terms of 'reference levels' and 'basic restrictions' under general public and occupational exposure conditions. As shown in **Table 14.4**, occupational exposure limits are set higher than public exposure limits and apply to individuals who are subject to increased exposure in the course of their work and are either trained to manage, or be aware of, the exposure. There is no substantial evidence of adverse health effects from exposure below the occupational limits.

Table 14.4 ICNIRP EMF Reference Levels (ICNIRP, 2020)

Exposure Characteristic	Electric Field	Magnetic Field
Public exposure	5 kV/m	2,000 milliGauss (mG) or 160 amperes per metre (A/m)
Occupational exposure	10 kV/m	10,000 mG or 796 A/m

The Proposal would result in a localised alteration to EMF in the immediate vicinity of the new transmission lines. However, EMF levels decrease very quickly from powerlines and are not anticipated to result in impacts on nearby properties or people or livestock utilising the easements for recreational or rural uses.

The new alignments have been designed to minimise potential EMF impacts of the Proposal where practicable, in accordance with the following hierarchy:

- Structures other than those associated with the Transgrid transmission lines will not be within a 17 m ground exclusion zone either side of each transmission line's centre line.
- The new alignments were sited to avoid residences and commercial or industrial buildings such as the LMWQCC, thereby minimising the risk of public exposure.
- Tower heights have been selected to ensure the powerlines would have appropriate clearance above the ground and that EMF exposure levels would be below the relevant reference levels.
- All fences passing within the easements of the new alignments will have isolation panels installed and be earthed as per Transgrid fencing guidelines (Transgrid, 2016).
- All metallic infrastructure that crosses or runs parallel to an easement of the new alignments will be tested to ensure that the required earthing and isolation is in place.

As a result of the above, the exposure levels of the new alignments would be below the public and occupational exposure limits at ground level, including directly under the cables. Impacts arising from exposure to EMF from the Proposal are therefore not predicted to occur.

14.4.2 Beneficial Impacts

The Centre for International Economics (CIE) prepared a community-wide cost-benefit analysis for the Proposal, based on the ACT Government's economic appraisal methodology. The following benefits were identified for the Proposal:

- Creation of additional residential lots, including 65 lots for affordable residences and 86 lots to be offered to eligible community housing providers (a benefit to the GJV and current/future landholders).
- Value uplift for future lot sales due to the removal of existing Lines 1 and 7 near Ginninderry (benefit to the GJV).
- Improved visual amenity due to the removal of existing Lines 1 and 7 near Ginninderry (benefit to Ginninderry residents, nearby rural landholders, and visitors to public reserve areas including Shepherds Lookout, the GCC and the Molonglo and Murrumbidgee River corridors).
- Payment for easements (benefit to host landholders).
- Net reduction in transmission line maintenance costs due to reduction in length of transmission line (benefit to Transgrid).

As summarised in **Table 14.5**, CIE's cost-benefit analysis concluded that 55.7% ($39.05 million) of the Proposal's estimated net benefits would be received by the ACT community (via the ACT Government), and 7.1% ($4.98 million) would be received by the local community. The remaining 37.2% ($26.1 million) of the Proposal's benefits would be received by the Proposal's private development partner, Riverview Group, and Transgrid as the future owner and operator of the assets. These benefits are discussed in more detail below.

Table 14.5 Distribution of Net Benefits from the Proposal (CIE, 2024)

Beneficiary	Estimated Net Benefit ($ million)	Share of Net Benefits (%)
ACT community via the ACT Government	39.05	55.7
Local community	4.98	7.1
Transgrid	0.07	0.1
Riverview Group	26.03	37.1
Total	**70.14**	**100**

As shown in **Table 14.6**, the GJV would have substantial costs associated with implementing the proposed realignment works and developing the resulting land parcels that become available for sale ($125 million of total costs), but this would be outweighed by the sale of the new properties and the value uplift on other properties located near the transmission lines being removed ($190 million of total benefits). This would generate a net benefit of approximately $65 million for the GJV.

The community would be subject to net benefits arising from improved local amenity for Ginninderry residents (valued at $4.98 million), with adverse impacts on host landholders assumed to be balanced by compensation from the GJV. The Proposal would also result in a net reduction in conservation land impacted by transmission lines, which would result in a net benefit to public land users and managers of $1.13 million. Finally, Transgrid would also be subject to a net benefit of $0.07 million ($70,000) associated with reduced transmission line lengths and maintenance costs.

Table 14.6 Costs (-) and Benefits (+) of the Proposal in Net Present Value (from (CIE, 2024))

Stakeholder	Cost ($ million)	Benefit ($ million)	Net Cost / Benefit ($ million)
GJV	**-124.90**	**189.98**	**65.09**
Transmission line realignment costs	-71.54	N/A	-71.54
Land production costs of new land parcels	-53.36	N/A	-53.36
Value of additional lots	N/A	174.67	174.67
Value uplift of existing lots located near the lines to be removed	N/A	15.31	15.31
Local community	**0.00**	**3.85**	**3.85**
Improved visual amenity for Ginninderry residents due to the removal of existing Lines 1 and 7	N/A	3.85	3.85
Net impact on host landholders	0.00 (compensation is assumed to balance impacts)		0.00
PCS/conservation land users	**0.00**	**1.13**	**1.13**
Net biodiversity impacts on conservation land due to a net increase in conservation land and increased funding for conservation activities in the GCC	N/A	1.13	1.13
Transgrid	**0.00**	**0.07**	**0.07**
Net reduction in maintenance costs of transmission infrastructure	N/A	0.07	0.07
Total	**-124.90**	**195.03**	**70.14**

14.5 Mitigation and Management Measures

Measures for mitigating and managing potential adverse socio-economic impacts of the Proposal, and for enhancing beneficial impacts, will be implemented throughout the lifetime of the Proposal.
These measures are discussed in detail below.

14.5.1 Targeted Stakeholder Engagement

Risks associated with receiving unanticipated public comments during the EIS process are currently being managed in accordance with the GJV's stakeholder engagement strategy. As discussed in **Section 14.4.1.1**, the strategy is based on a needs-based approach that identifies appropriate engagement mechanisms for each stakeholder group relevant to the Proposal. The GJV has aimed to engage with the community early in the Proposal's development to identify any community concerns at a time when any rework to the Proposal design or specialist technical studies will have minimal impacts to the development timeline. Stakeholders will continue to be kept up to date with any changes associated with the Proposal.

14.5.2 Landholder Compensation

The Proposal has been designed to minimise its impact area, thereby minimising the area of usable land that would be lost to landholders. The GJV has an arrangement in place to pay affected landowners for easements for the new transmission lines. The relevant landholders have agreed to the amounts payable, and as such it is assumed that the impacts on host landholders would be neutral, with the compensation balancing adverse impacts associated with loss of usable land and amenity.

14.5.3 Management of Local Amenity

Potential impacts on local amenity arising from increased levels of noise, vibration, dust emissions, lighting and traffic, and from loss of visual amenity along the new alignments, will be mitigated and managed through the implementation of various sub-plans to the CEMP. These measures are detailed in earlier chapters of the EIS and are summarised in **Table 14.7**.

Table 14.7 Summary of Mitigation and Management Measures for Potential Amenity Impacts of the Proposal

Risk	Summary of Mitigation and Management	EIS Reference
Noise	• Construction noise will be managed in accordance with controls documented in a CNVMP, consistent with AS 2436, including: o Low noise equipment and construction methodologies to be selected where possible. o Equipment and vehicles to be turned off when not in use. o Equipment and vehicles to be regularly serviced in accordance with manufacturer requirements. o Acoustic covers on machine engines to remain closed at all times. o Plant to be located and orientated to direct noise away from the nearest occupied receivers where possible. o Noisy machinery to not be operated simultaneously or in a concentrated location where possible. o Controls for minimising traffic-related noise, such as decreasing vehicle speeds in the vicinity of residential areas, and avoiding compression braking and the use of air brakes near residential areas. o Reversing of vehicles and plant to be avoided where possible. o Hearing protection and training to manage noise impacts to be provided to Proposal construction personnel. • Traffic-related noise impacts will be managed using controls specified in a TMP such as: o Heavy vehicle speed limits to be used in the vicinity of residential areas. o Compression braking and the use of air brakes to be avoided near residential areas. • The CEMP will contain protocols for community consultation and complaints handling. Noise affected properties will be notified of the timing, duration and nature of construction works at least seven days prior to works commencing. • The CNVMP will specify management strategies in the event that works are required outside of standard working hours. All on-site workers will be inducted on the CNVMP and be provided with training to manage noise impacts. • The GJV will liaise with the developers of other construction projects in the area with the aim of scheduling noisy construction activities of the Proposal to minimise cumulative impacts on receivers. • Detailed design will include consideration of measures for mitigating corona effects during Proposal operation, including the use of line fittings and conductor arrangements. • If corona discharge noise is identified as an issue via community complaints, noise monitoring will be undertaken to determine noise levels. As per standard practice, at-property treatments, if triggered, would need to be determined in consultation with the landholder and informed by a detailed building condition survey and final confirmed noise levels. Noise monitoring during corona discharge conditions and building condition surveys would determine if acoustic treatment is required and the level of treatment required.	**Chapter 10.0**

Risk	Summary of Mitigation and Management	EIS Reference
Vibration	• Construction vibration will be managed in accordance with controls documented in the CNVMP, including: o Equipment and vehicles to be turned off when not in use. o Equipment and vehicles to be regularly serviced in accordance with manufacturer requirements. o Vibration-intensive machinery to not be operated simultaneously or in a concentrated location where possible. o Vibration-generating equipment to be sized to avoid the risk of damage to nearby structures. o Once construction equipment has been selected, minimum working distances are to be established for all vibration-generating equipment. Site-specific vibration minimum working distances are to be identified for all equipment once selected. • Additional mitigation measures will be included in the CNVMP depending on the results of geotechnical investigations and need for vibration-inducing equipment, such as the use of smaller or different machinery. • In the event that any vibration-generating equipment would be used within the identified safe working distances, or in the event that undocumented heritage structures are discovered during construction, the following will be documented in the CNVMP and implemented: o An independent specific structural assessment of the structure will be undertaken to ascertain the structural integrity and its ability to withstand vibration, and to establish an appropriate vibration minimum working distance and impact criteria. o A dilapidation survey of the structure will be undertaken prior to works commencing, and regular inspections will be conducted throughout the construction activities. o Where appropriate, continuous vibration monitoring will be conducted on the structure for the duration of the period of construction while vibration generating equipment is being used. The vibration logger will be equipped with the ability to remotely alert construction staff to reduce or cease construction activities if vibration levels are approaching the criterion threshold. • The CEMP will contain protocols for community consultation and complaints handling. • The CNVMP will specify management strategies in the event that works are required outside of standard working hours. All on-site workers will be inducted on the CNVMP and be provided with training to manage vibration impacts. • The GJV will liaise with the developers of other construction projects in the area with the aim of scheduling vibration-inducing construction activities of the Proposal to minimise cumulative impacts on receivers.	**Chapter 10.0**

Risk	Summary of Mitigation and Management	EIS Reference
Dust emissions	• The CEMP will include measures for mitigating and managing potential air quality impacts caused by dust emissions, such as: o Civil works to be staged to minimise areas of exposed soil, where practicable. o Silt and other materials to be removed from around any sediment and erosion control structures to prevent the deposits from becoming a dust source. o Vehicle speeds to be limited on any unsealed/non-gravelled areas. o Trucks to be covered when carrying dry earth material such as spoil. o Site entrances to be cleaned as needed to prevent the build-up of soil that could become airborne. o Dust generating activities to cease during high winds until dust suppression can be undertaken. o Dust suppression to be used on exposed soil and/or stockpiles to control any visible dust plumes. Water or similar (e.g. Spraygrass) would be used. Stockpiles to also be stabilised (vegetated) if in place for more than 14 days. • The Proposal's construction schedule will be shared with developers in the vicinity of the Proposal Area who will be undertaking ground disturbing activities at the same time as Proposal construction (e.g. Ginninderry and Neoen for the Territory Battery), to identify staging opportunities to minimise concurrent dust emissions.	**Chapter 12.0**
Lighting	• Lighting during construction will be limited to any periods of poor ambient light when safe work conditions require artificial lighting. • Lighting would be directed towards the construction footprint and away from sensitive receptors.	**Chapter 9.0**
Visual amenity loss	• The CEMP will include measures for mitigating and managing potential visual amenity impacts associated with vegetation clearance, such as: o Approved disturbance areas to be demarcated on site, to ensure that vegetation clearance and vehicle movements do not occur in areas not approved for these activities. o Fences or barriers to be used to demarcate no-go zones. o Rehabilitation of construction areas to occur as soon as possible. • No measures to mitigate visual amenity impacts during operation, such as vegetation screening, are proposed, as they would have adverse impacts on views of the surrounding rural and riverine landscapes which are considered to outweigh benefits from screening views of the new alignments.	**Chapter 9.0**

Risk	Summary of Mitigation and Management	EIS Reference
Traffic disruption and safety risks	• Construction will be restricted to: o Monday to Friday: 7 am to 6 pm. o Saturday: 7 am to 1 pm. • Heavy vehicles accessing the Proposal Area will be spaced evenly throughout the day where possible to minimise disruption to other road users. • The CEMP will include a TMP with traffic management controls such as: o Local residents and businesses to be notified of potential traffic disruptions, with details such as the expected dates and timing of the disruption and the nature of the disruption to be provided. o Approved heavy vehicle access route to be documented and communicated to transport companies prior to delivery of equipment and materials. • The CEMP will include a TMP with traffic management controls such as: o Signage to be placed along major roads to warn drivers of construction work and vehicles entering and exiting the Proposal Area. • The TMP will be implemented by qualified personnel from either the construction company or a separate temporary traffic management company. • The TMP will be adaptive and able to be updated in response to the identification of any inadequate traffic management controls. • The TMP will include procedures for monitoring the effectiveness of controls in an effort to identify any inadequate controls prior to any incidents occurring. • The CEMP will include a complaints handling procedure for ensuring that any feedback from the community can be communicated to the GJV for integration in the CEMP and sub-plans. • The GJV will liaise with Ginninderry and any other nearby developers and businesses to minimise potential cumulative traffic disruption impacts on local road users where practicable.	**Chapter 11.0**

14.5.4 Exposure to Electromagnetic Fields

The Proposal has been specifically designed to avoid residences and commercial buildings, and to have an appropriate clearance height to ensure that EMF exposure levels are below the relevant guidelines, as discussed in **Section 14.4.1.4**.

EMF modelling was undertaken to ensure maximum load conditions and maximum line ratings are consistent with the ICNIRP guidelines. A review of fences and other metallic infrastructure located along the new alignments was undertaken. All fences within the new easements will be isolated as per the Transgrid fencing guidelines (Transgrid, 2016).

Commissioning of the new alignments will involve testing (low voltage current injection testing) to verify that the transmission lines have been adequately earthed and whether there are any hazards (e.g. metallic structures) that need to be mitigated which were not identified during the Proposal's design stage. Contractors will have this requirement written into their scope of work beyond standard approaches to achieve best practice, as is done for other Transgrid construction projects such as the Stockdill Substation.

14.6 Residual Risk Assessment

The residual risk assessment in **Table 14.8** provides revised risk ratings with consideration of the mitigation and management measures discussed in **Section 14.5**. Residual risk ratings range from negligible to high, with all risks able to be reduced to ALARP.

A significant residual risk of local amenity impacts during Proposal operation remains due to the unavoidable visual impacts associated with introducing new transmission line infrastructure into the landscape, which cannot be further mitigated. The preliminary risk rating for this risk was already ALARP as the Proposal design has been developed over several years to avoid and minimise visual impacts wherever practicable. Given the detailed design work that has been undertaken for the Proposal to date, impacts on visual amenity have been minimised and there is therefore minimal scope for further mitigation measures.

A significant residual safety risk associated with construction and demolition traffic also remains. Although the likelihood of someone being injured by construction or demolition traffic is remote, the consequence is catastrophic due to the potential for loss of life. This risk will be managed by qualified traffic management staff engaged by the GJV to implement the temporary traffic management measures during construction and decommissioning.

Table 14.8 Residual Assessment of Risks Associated with Socio-economics

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Design								
SE1	Unanticipated public concerns or comments received during the EIS process results in rework, delays or public animosity.	Medium	No	• The GJV has undertaken extensive targeted consultation and broader community engagement since 2020, including: o Site walkovers and Aboriginal cultural heritage mapping with the ACT RAOs. o Regular consultation and updates with all landholders impacted by the proposed realignment works including ACT, NSW and Australian Government agencies; and commercial and private landholders. o Valuations of the proposed easements for the new alignments and offers of compensation to all affected landholders. o Community updates about the Proposal to various special interest groups. o Two community drop-in information sessions in November 2024, targeting nearby ACT and NSW residents, respectively. o Public exhibition of the EPBC Act referrals.	Unlikely	Moderate	Low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				• The GJV has aimed to engage with the community early in the Proposal's development to identify any community concerns at a time when any rework to the Proposal design or specialist technical studies will have minimal impacts on the development timeline. Stakeholders will continue to be kept up to date with any changes associated with the Proposal.				
SE2	Siting of the Proposal results in a loss of agricultural land.	Negligible	Yes	• The Proposal would result in a small loss of grazing land along the new alignments relative to the total size of the agricultural blocks and rural leases. The surrounding areas would continue to be available for grazing following completion of construction. Any loss of income associated with the loss of grazing land would be offset through the financial arrangements in place between the GJV and the landholders. The Proposal is therefore not expected to cause a loss of income to the landholders or to the broader economy.	Unlikely	Minimal	Negligible	Yes
SE3	Impacts on human health and safety from exposure to electromagnetic fields (EMF) and frequencies associated with high voltage powerlines.	Medium	No	• Refer to the mitigation measures provided for HR8 (**Table 15.6**, **Section 15.6**).	Remote	Moderate	Very low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Construction								
SE4	People in areas near the Proposal are exposed to increased levels of noise, vibration, dust emissions, lighting and traffic from construction and demolition activities, reducing local amenity and potentially resulting in community complaints, non-compliance with the EP Act and/or safety issues.	Very high	No	• Industry best practice CEMP will be implemented that includes a range of sub-plans for mitigating and managing local amenity and traffic impacts. Refer to the mitigation measures provided for the following risks for information: o Noise and vibration: N1, N2 and N3; **Section 10.6**. o Dust emissions: CC1 and CC2; **Section 9.6**. o Lighting and visual amenity: L3, L4 and L5; **Section 9.6**. o Traffic disruption and safety: T1, T2 and T5; **Section 11.6**.	Unlikely	Catastrophic	High	Yes
Operation								
SE5	Residents or landholders near the new alignments raise unanticipated or additional concerns to those raised during targeted in the development process, resulting in community complaints, public animosity and/or reputational risks.	Medium	No	• Refer to the mitigation measures provided for SE1.	Unlikely	Moderate	Low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
SE6	People in areas near the Proposal are exposed to increased levels of noise and reduced visual amenity once the Proposal is operational, reducing local amenity and potentially resulting in community complaints and non-compliance with the EP Act.	High	Yes	• Refer to the mitigation measures provided for the following risks for information on how amenity impacts will be managed during Proposal operation: o Noise: N4 and N5; **Section 10.6**. o Visual amenity: L6 and L7; **Section 9.6**.	Likely	Moderate	High	Yes

15.0 Hazard and Risk

Chapter Summary
This chapter provides an assessment of the hazards and risks associated with the Proposal, including those that relate to bushfire, electromagnetic field and electromagnetic induced risks, electrical hazards, and impacts on utilities.

15.1 Preliminary Risk Assessment

An assessment of fire, electrical and safety hazards and risks associated with the Proposal is provided in **Table 15.1**. The risk ratings range from low to very high. All but one of the risks are associated with potentially significant impacts due to the risk of serious injury or mortality.

Section 15.2 to **Section 15.6** provide a detailed assessment of these risks. The residual risk assessment in **Section 15.7** provides revised ratings for each risk based on the mitigation and management measures described in each of the previous sections.

Table 15.1 Preliminary Assessment of Risks Associated with Bushfire and Electrical and Safety Hazards

ID	Risk Scenario	Preliminary Risk Assessment			
		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Construction					
HR1	Sparks from construction machinery, vehicles or electrical works start a fire, resulting in fire spreading into the surrounding landscape.	Possible	Catastrophic	Very high	No
HR2	Unapproved access to site leads to injury or death through contact with electrical equipment.	Unlikely	Catastrophic	High	No
HR3	Working with high voltage infrastructure places construction workers at risk of injury or death.	Possible	Catastrophic	Very high	No
HR4	Construction activities result in unintended damage to existing utilities and other essential infrastructure.	Unlikely	Major	Medium	No
Operation					
HR5	Sparks from maintenance machinery, vehicles or electrical works start a fire, resulting in fire spreading into the surrounding landscape.	Possible	Catastrophic	Very high	No
HR6	Unapproved access to site leads to injury or death through contact with electrical equipment.	Remote	Catastrophic	Medium	No
HR7	Maintenance of Proposal components is not undertaken appropriately or effectively over the life of the Proposal, resulting in increased bushfire risk to the surrounding landscape and/or the system not operating as designed.	Unlikely	Moderate	Low	No

ID	Risk Scenario	Preliminary Risk Assessment			
		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
HR8	Impacts on human health and safety from exposure to electromagnetic fields (EMF) and frequencies associated with high voltage powerlines.	Unlikely	Major	Medium	No
HR9	Aircraft operating in the vicinity of the Proposal collide with the new transmission lines.	Unlikely	Catastrophic	High	No

15.2 Investigations

Several investigations have been undertaken to understand electrical hazards and safety risks associated with the Proposal, including bushfire risk, electromagnetic field (EMF) and electromagnetic induction (EMI) risks, and electrical hazards. The assessment provided in this EIS has considered the following studies:

- Bushfire Assessment Report for the Upper & Lower Tumut 330 kV Transmission Line Project (ABPP, 2024) (Bushfire Risk Assessment) – **Appendix G9.**
- Electric and magnetic field (EMF) assessment – Transgrid transmission lines 1, 7 relocation (CNDP, 2024) (EMF/EMI Assessment) – **Appendix G10.**

Bushfire risk is discussed in **Section 15.3** and electrical hazards in **Section 15.5.2**. Potential impacts on utilities and aircraft are discussed in **Section 15.5.3** and **Section 15.6**, respectively. These were not subject to standalone specialist assessments.

15.3 Bushfire Risk Assessment

15.3.1 Background and Existing Conditions

Australian Bushfire Protection Planners (ABPP) prepared a Bushfire Assessment Report that examines the level of bushfire risk to and from the Proposal. It also determines appropriate protection measures required to mitigate bushfire risk posed by operation of the transmission lines.

Bushfire risk is defined as the chance of a bushfire occurring that will have harmful consequences to human communities and the environment. Bushfire risk is assessed through consideration of the likelihood of ignition and consequences of a bushfire occurring. Risk reduction can be achieved by reducing the likelihood of a bushfire, the opportunity for a bushfire to spread or the consequence of a bushfire (on natural and built assets) (ABPP, 2024).

The Bushfire Risk Assessment involved a desktop assessment but incorporated outcomes from the desktop and field investigations undertaken in the BAR in relation to vegetation in the surrounding landscape (as summarised in **Chapter 5.0**). The assessment also considered ABPP's prior knowledge of the Proposal Area, with ABPP haven undertaken bushfire assessments for other projects in the area, including the Stockdill Substation.

The Strategic Bushfire Management Plan (SBMP) (ESA, 2019) identifies bushfire prone areas in the ACT. The Bushfire Prone Area (BPA) map identifies areas of the ACT that have been assessed as having a high risk of being impacted by bushfire, based primarily on the potential fuel load of the land. As shown in **Figure** 15.1, the Proposal Area is located within the BPA as it contains bushfire prone vegetation, including native and exotic grassland and pockets of native and exotic woodland.

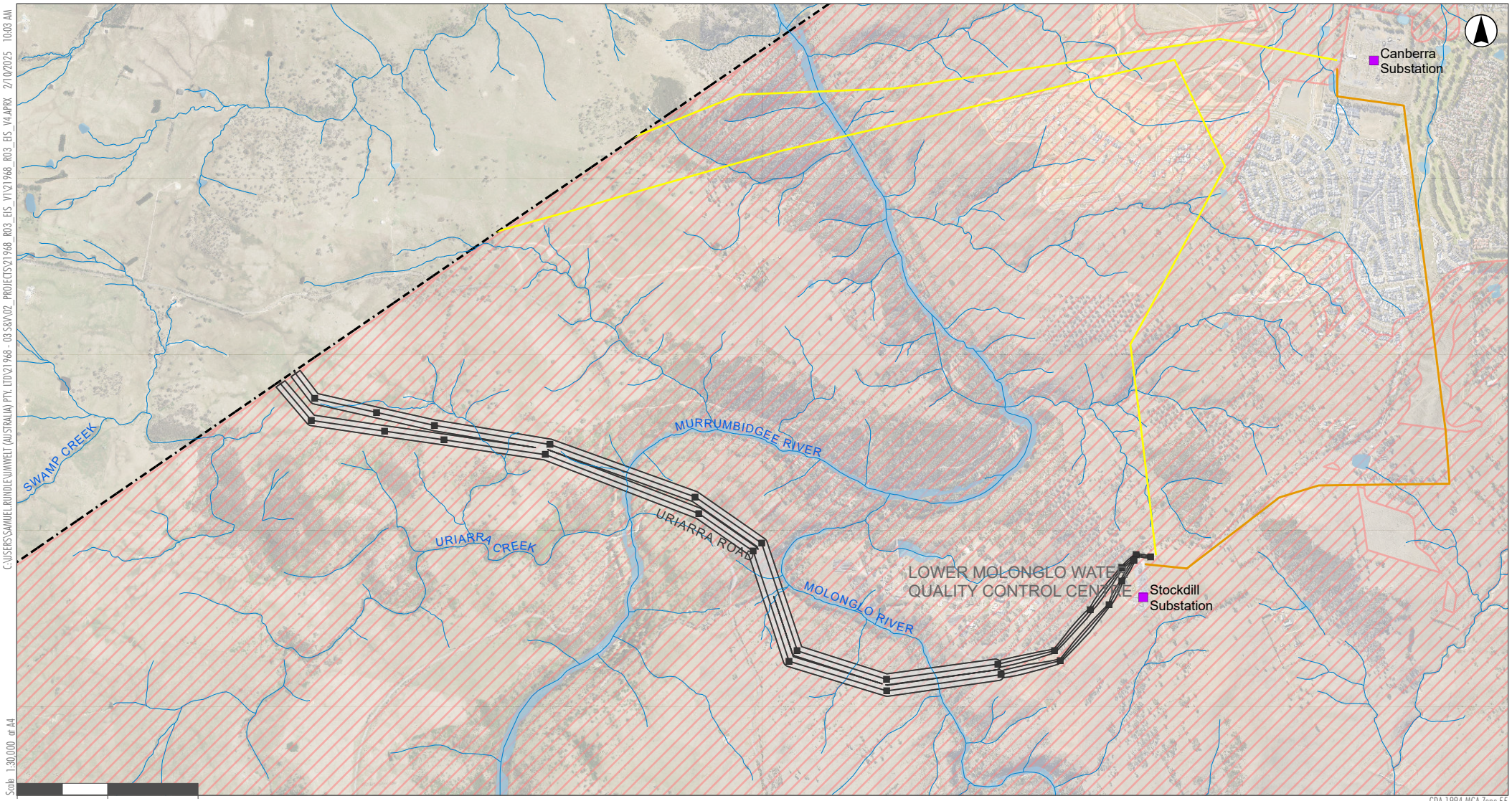
The SBMP also specifies the need for landholders to prepare Bushfire Operational Plans (BOPs) for unleased land or land managed by the ACT Government, in accordance with the Emergencies Act (as summarised in **Section 3.1.1.5**). A BOP details the specific bushfire mitigation activities to be undertaken by a landholder to reduce the risk of bushfire spreading into an urban area. **Figure 15.2** provides an extract from the BOP Map which identifies land in the vicinity of the Proposal Area which is managed by the ACT Government. Management practices include grazing along the Molonglo River Corridor and within the GCC, slashing along major road verges, and chemical treatment at Uriarra Crossing.

Fire management zones detail the bushfire mitigation activities to be undertaken at a broader scale to reduce the risk of bushfire spreading into the edge of the urban areas. **Figure 15.3** shows the fire management zones through which the Proposal traverses. Most of the Proposal Area is in the Agricultural Fire Management Zone which requires fuel to be managed by landholders in accordance with the agricultural uses of the land. The nature reserves are in the Landscape Fire Management Zone where hazard reduction burns are typically undertaken to meet ecological or water catchment requirements, and the major road verges are in the Strategic Firefighting Advantage Zone which are managed to break up major fire runs that would otherwise impact on residential areas (ESA, 2019).

When analysing fire risks that might emerge in the ACT, a dangerous and damaging fire has the potential to occur when the following conditions prevail:

- Continuous available fuel – fuel with a low moisture content (typically caused by the maturing and drying of grasslands or drought) can undergo rapid combustion.
- Exposure of vulnerable assets – The ‘catchment’ for such fires may be within several hundred metres or many (60–70) kilometres from the asset/s.
- Weather conditions that generate a forest or grass fire danger index of very high or greater. In the ACT, prevailing adverse fire weather will typically have a strong northerly through to south-westerly wind influence.
- A fire in the landscape which is not effectively suppressed.

Existing fuel load management activities within the Proposal Area, as required by the BOPs and fire management zones, would greatly reduce the bushfire risk to the Proposal. However, the Bushfire Assessment Report determined that the bushfire risk to the Proposal from the north, northwest, west and southwest would be extreme. The bushfire risk to the Proposal from the south and southeast would be high. The fire path from the northwest has the potential to rapidly travel across the landscape, crossing the Murrumbidgee River corridor and spreading upslope along the Molonglo River corridor in a south-easterly direction. A similar potential exists for a fire event to spread across the landscape under northerly, westerly, and south-westerly winds.



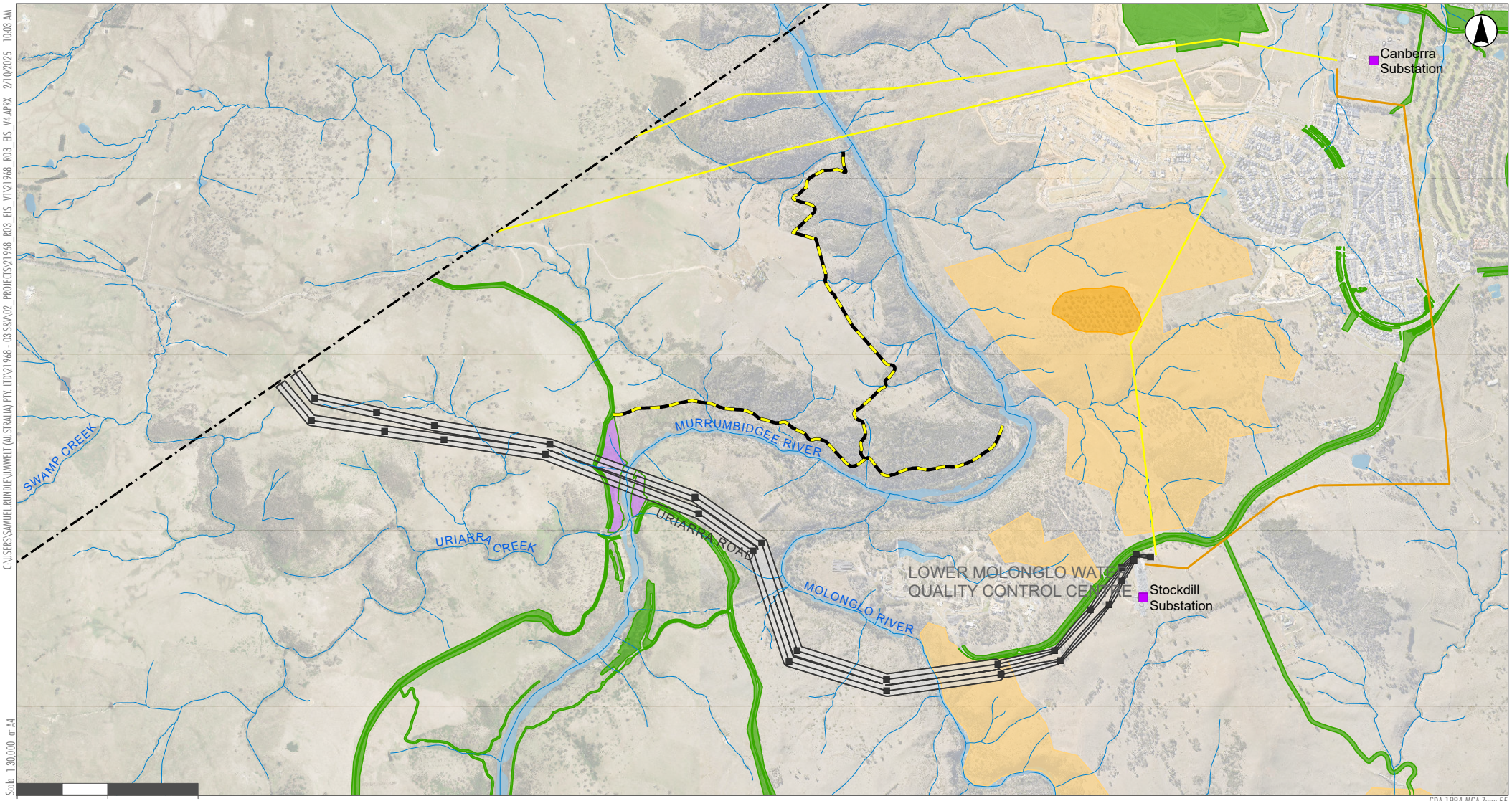
Legend

- Transmission Lines to be Removed
- Line 3C Alignment – subject to separate approvals
- New Alignments
- Bushfire Prone Area
- Existing Substation
- State Forest
- NSW - ACT Border
- Road
- Drainage Line
- Waterbodies

FIGURE 15.1

ACT Bushfire Prone Land

Image Source: Nearmap (2022) Data source: ACT Government (2021)



Legend

- Existing Substation
- Transmission Lines to be Removed
- Line 3C Alignment – subject to separate approvals
- New Alignments

Bushfire Operations Plan

- Maintenance
- State Forest
- NSW - ACT Border
- Road
- Drainage Line
- Waterbodies

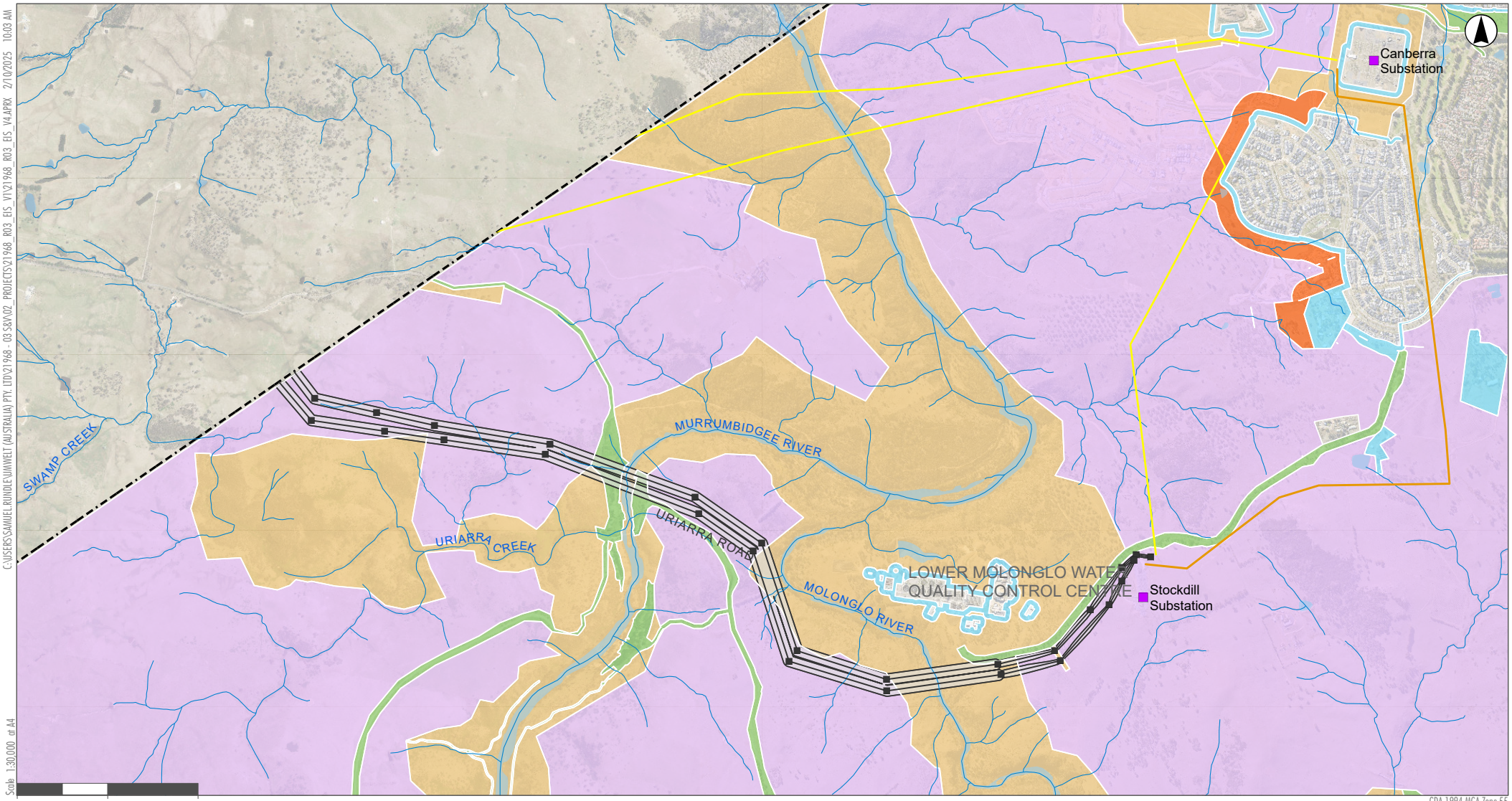
Fuel Load Management

- Chemical
- Ecological Burn
- Grazing
- Prescribed Burn (PCS)
- Prescribed Burn (RFS)
- Slashing

FIGURE 15.2

Bushfire Operations Plans

Image Source: Nearmap (2022) Data source: ACT Government (2021)



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Legend

- Transmission Lines to be Removed
- Line 3C Alignment – subject to separate approvals
- New Alignments
- NSW - ACT Border
- State Forest
- Existing Substation
- Road
- Drainage Line
- Waterbodies

Strategic Bushfire Management Zones (SBMZ)

- Agricultural Fire Management Zone
- Inner Asset Protection Zone
- Landscape Fire Management Zone
- Outer Asset Protection Zone
- Strategic Firefighting Advantage Zone

FIGURE 15.3

ACT Fire Management Zones

Image Source: Nearmap (2022) Data source: ACT Government (2021)

15.3.2 Potential Impacts

Potential fire-related impacts associated with the Proposal include fire caused by sparks from construction or maintenance machinery, vehicles or electrical works; or a fault in the Proposal equipment; which spreads into the surrounding landscape. A bushfire in the Proposal Area could have widespread biodiversity and water quality impacts if it spread into the surrounding landscape, particularly if it crosses the Molonglo and Murrumbidgee River and travels into the mountains and nature reserves west of the Proposal Area. A bushfire could also lead to property damage and loss of life in nearby residential areas, rural properties and adjacent industrial sites such as the LMWQCC and Stockdill Substation. This could then have implications for water and sewerage treatment and power supply to the broader ACT region.

Bushfires can also cause physical damage to transmission lines if there is flame contact on the equipment, which could cause external elements such as exposed cabling and metal components to melt. More frequently, heat and smoke from bushfires can interrupt electricity supply. Both of these events are more likely to occur from a woodland bushfire, where the taller flame height and higher radiant heat levels of burning trees have a greater risk of impacting transmission infrastructure.

The location of the new alignments was chosen to avoid areas of woodland vegetation, with a preference for siting infrastructure in the exotic grassland vegetation to avoid biodiversity impacts. This has the added benefit of mitigating bushfire risk to the conductors. The height of the conductors would vary above the ground, but have a minimum mid-span clearance of 5 m above the retained vegetation (grassland or woodland). Where the minimum clearance (5 m) to the conductors occurs above grassland vegetation, the exposure of the transmission line to the radiant heat flux produced by the grassland vegetation will be of short duration and is unlikely to cause damage due to the grassland fuels being rapidly consumed by fire, with no residual levels of radiant heat expected to occur.

Where the minimum clearance to the conductors occurs above woodland vegetation (e.g. in the river corridors), the levels of initial and residual radiant heat would be higher due to the increased fuel loadings and potential slower passage of the fire across the woodland vegetation. However, the clearance between the Proposal's conductors and woodland vegetation would be substantially greater over the river corridors (e.g. between 20 m and 60 m), thus this impact would have a short duration time (less than 30 minutes), with a moderate level of risk to the transmission lines.

The steel towers and poles would not be damaged by high levels of radiant heat flux from either a woodland or grass fire.

Additional information on the management of water during fire suppressing activities was requested in the Draft EIS. Water generated from fire suppression as a result of construction activities would be captured through erosion and sediment control structures in place at each tower. While the risk of bushfire is *very high* due to its potential consequence, the likelihood of bushfires starting as a result of construction with mitigation measures in place is only *possible*. The existing water run off management is anticipated to be adequate for this scenario.

Permanent water management around the towers during operation is not a standard requirement for transmission lines, as they generally pose a low risk of ignition when vegetation and infrastructure is well maintained. As they are also not combustible, the requirement for a dedicated fire water supply is not standard.

15.3.3 Mitigation and Management Measures

The ACT Bushfire Management Standards (BMS) (ESA, 2023) provide standards for all development located on bushfire prone land in the ACT. For critical infrastructure such as transmission lines, they specify that the most vulnerable component of each part of a facility which is critical to its continued functioning in a bushfire, must be identified and designed to prevent failure from the radiant heat flux of a bushfire.

The use of heavy steel for the towers and poles will minimise damage from high levels of radiant heat flux.

The Bushfire Assessment Report concluded that the provision of designated Asset Protection Zones (APZs) around the new towers and poles is not required as these structures would withstand the radiant heat levels from a bushfire. Further, the provision of designated APZs along the transmission line corridor is not required as the transmission line easements will be maintained to strict Transgrid requirements (see **Section 2.3.4**), mitigating the level of radiant heat exposure to the conductors.

Consistent with the BMS, a Bushfire Emergency Management and Operations Plan (BEMOP) will be prepared to identify all relevant risks and mitigation measures associated with construction and operation of the Proposal. The BEMOP will include detail about the following:

- Measures to prevent or mitigate fire ignition.
- Work that should not be carried out during total fire bans.
- Location and availability of fire-suppression equipment, access, and water supply.
- Storage locations of fuels and any other flammable materials.
- Procedures for notifying the Emergency Services Agency (ESA) about any works that have the potential to ignite surrounding vegetation which are proposed to be carried out during a bushfire danger period, to ensure weather conditions are appropriate.
- Bushfire emergency management planning.

The BEMOP will identify appropriate procedures for construction and maintenance staff to follow in the event of a bushfire and contain the following minimum requirements:

- Name and address of facility.
- Contact details (including phone number).
- Number of employees/contractors.
- Details about the primary action procedure (evacuate or take shelter), including the location or address of the primary action.
- Details about back-up/pre-emptive procedures, including the location or address.
- Assembly point(s) and/or transportation arrangements for an evacuation.
- Action statements for before, during and after a bushfire.
- Site layout of the Proposal, including the location of construction compounds and site offices.
- Employee list and contact details.

The detailed design process will also ensure there is appropriate access to the Proposal Area for fire-fighting operations, including:

- The access tracks will be designed to have an average width of 5 m (4 m with 6 m-wide passing bays) to satisfy Transgrid transmission line access standards consistent with the NSW RFS (2016) Fire Trail Standards. For the purposes of this EIS, the access tracks have been assessed based on a width of 10 m.
- Access roads will be designed and constructed to withstand the 40 t load capacity of Transgrid maintenance vehicles and fire-fighting appliances.
- Temporary and permanent access gates will have a minimum opening width of 3.6 m.

Fire protection measures that will be undertaken during construction of the Proposal will be detailed in the CEMP and/or BEMOP. They will include:

- Activities involving heavy earthmoving equipment and hot works such as grinding and welding will not be undertaken during declared Total Fire Ban days.
- Heavy machinery such as bulldozers and excavators will not be used in areas with surface rock during periods of high fire danger, which coincide with the official bushfire season in the ACT (1 October to 31 March).
- The head construction contractor will provide a suitable fire response tanker trailer at each site office during periods of high fire danger. The tanker trailer(s) will have a minimum water storage capacity of 1,000 L and contain a 30 m-long fire hose and nozzle and two rake-hoes.
- All vehicles and machinery will be equipped with portable fire extinguishers. If emergency work must be undertaken during extreme or catastrophic fire danger weather, the ACT Rural Fire Service (RFS) will be contacted to arrange for construction staff to be accompanied if required.

During Proposal operation, the transmission line easements will be regularly inspected during the fire danger period, and the grassland vegetation managed to maintain a maximum height of 200 mm when the grassland vegetation reaches 70% cured.

In addition, all Proposal equipment will be regularly maintained and serviced in accordance with manufacturer requirements to minimise the possibility of failure and associated safety risks, such as the risk of fire ignition. The GJV and Transgrid (including contractors) will comply with all relevant standards during design, construction, and maintenance to ensure that the Proposal operates efficiently and as intended.

15.4 EMF/EMI Assessment

15.4.1 Background

An EMF assessment was undertaken by Carbon Neutral Delivery Partners (CNDP, 2024) to evaluate potential safety impacts from EMF and EMI and related risks. It also addresses the UTR's requirements for the Proposal as specified in the EIS Scoping Document (see **Appendix A** and **Appendix B**).

All types of electrical equipment, including those associated with electrical substations and transmission lines, produce EMF. For a transmission line, the strength of the electric field varies generally with the operating voltage of the line (measured in volts), while the magnetic field strength is related to the current flowing in the line (measured in amperes). The current flowing in the line depends upon the load or power flow and varies with consumer demand on a daily and seasonal basis. The EMF strengths at ground level

below the conductors also depend on the height of the conductors above the ground and their geometric arrangements as supported by the transmission towers/poles.

The scientific literature on EMF exposure is extensive, complex and generally inconclusive. The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) is the Australian Government agency responsible for providing health assessments and recommendations to the government on matters relating to EMF. ARPANSA has adopted the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines for limiting exposure to EMF (ICNIRP, 2020).

The ICNIRP Guidelines express limits in terms of 'reference levels' and 'basic restrictions' under general public and occupational exposure conditions. The basic restriction values indicate the internal electric fields which can be induced in the body without adverse health outcomes and must be met by a development. The reference levels may be exceeded if it can be demonstrated that the basic restrictions are still met. The reference levels contained in the ICNIRP Guidelines are replicated in **Table 15.2**.

Table 15.2 ICNIRP EMF Reference Levels, from (ICNIRP, 2020)

Exposure Characteristics	Electric Field	Magnetic Field
Public exposure	5 kV/m	2,000 mG or 160 A/m
Occupational exposure	10 kV/m	10,000 mG or 796 A/m

15.4.2 Potential Impacts

Potential EMF impacts of the Proposal have been considered in relation to other existing EMF-generating electrical equipment located in the vicinity of the Proposal Area, including the Stockdill and Canberra Substations, existing Transgrid transmission lines located towards the eastern end of the Proposal Area, and lower voltage Evoenergy powerlines adjacent to Transgrid Line 3C.

The addition of the new transmission equipment as part of the Proposal would result in a localised alteration to EMF contours in the immediate vicinity of the new alignments. However, localised field levels would decrease very quickly from the cables and are not anticipated to result in impacts on adjacent properties or any people or livestock within the easements.

The Proposal has been designed with appropriate conductor clearance above the ground to ensure EMF exposure levels are below the relevant guidelines. The new alignments have been sited to avoid residences, thereby maximising the distance for public exposure. The new alignments are not located in any FUAs and are therefore not expected to pose any EMF health risks to residents in the future.

Preliminary modelling of EMF and magnetic fields was undertaken in the EMF/EMI Assessment to assess the Proposal's risk against the ICNIRP (2020) reference values in **Table 15.2**. As shown in **Plate 15.1** and **Plate 15.2**, the Proposal's EMF levels would be below the maximum electric field reference levels for public and occupational exposure, and well below the maximum magnetic field reference levels, respectively.

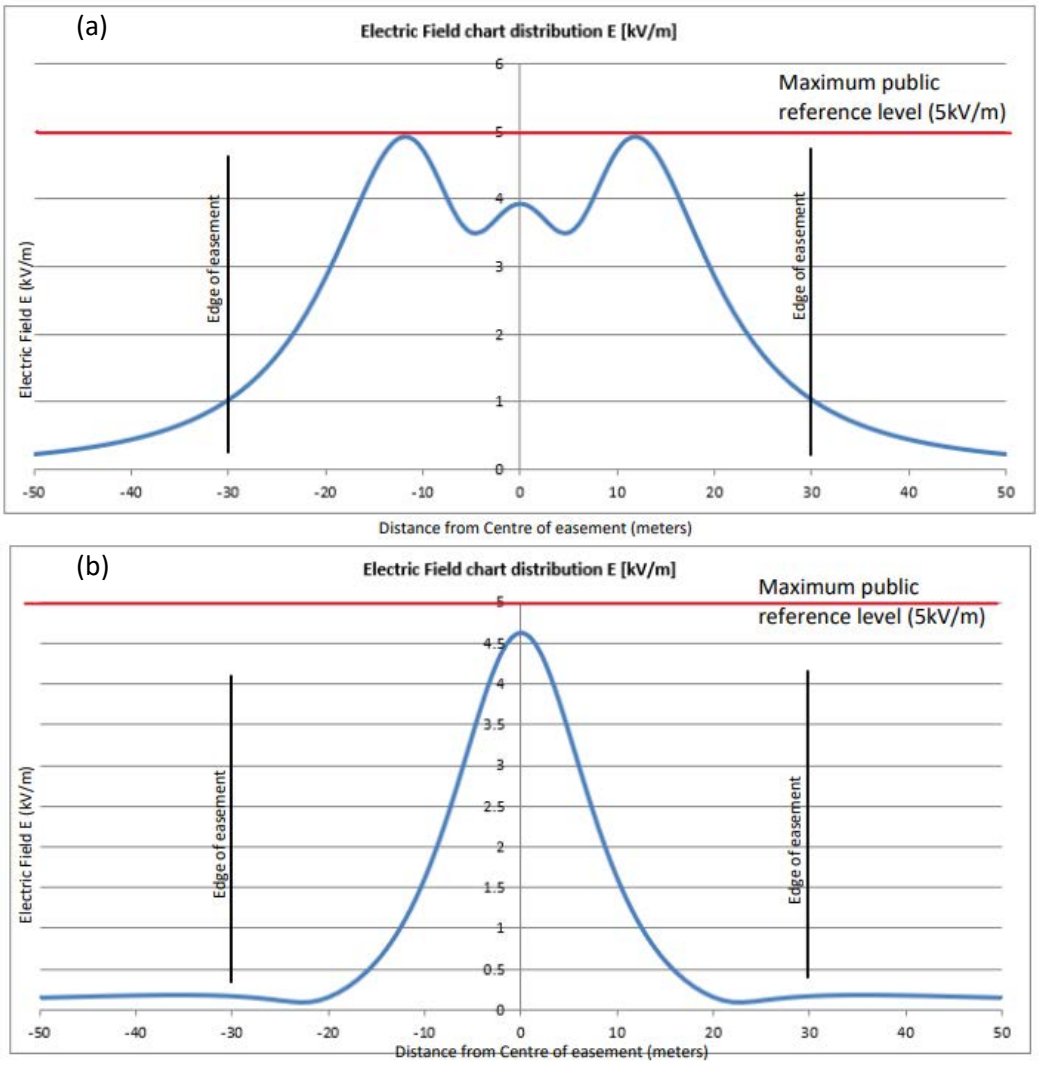


Plate 15.1 Maximum extent of electric field impacts for (a) transmission towers and (b) poles along the new alignments at locations where the conductors would be closest to the ground (CNDP, 2024)

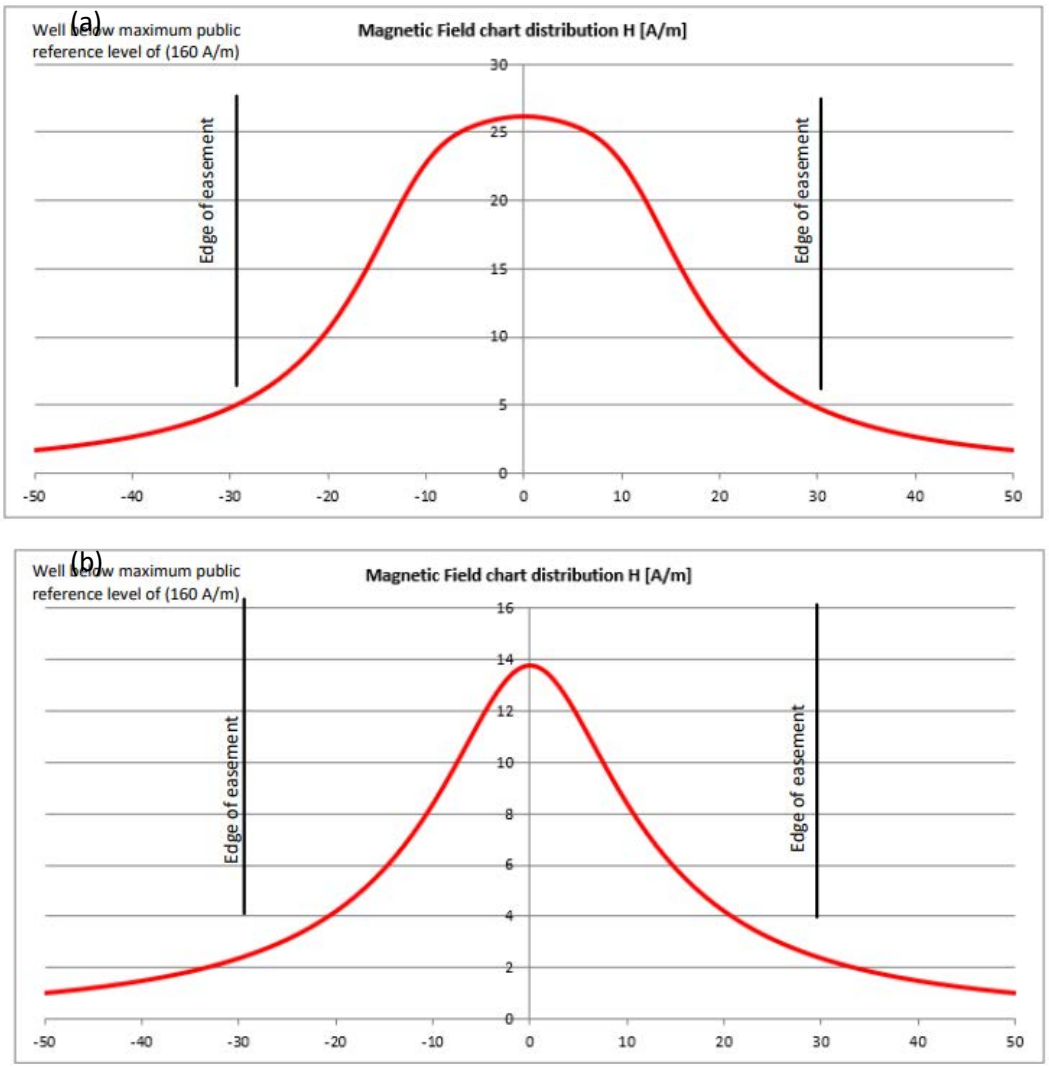


Plate 15.2 Maximum extent of magnetic field impacts for (a) transmission towers and (b) poles along the new alignments at locations where the conductors would be closest to the ground (CNDP, 2024)

As Lines 1 and 7 would be relocated and connections to the Stockdill and Canberra Substations would remain the same, the Proposal would not result in a change to Transgrid's network configuration. The Proposal will be able to maintain the electrical ratings of the two relocated lines because:

- The existing Line 1 connects to the Stockdill Substation but not the Canberra Substation. The new Line 1 would replace the existing Line 1 connection at the Stockdill Substation and would not be reconnected to the Canberra Substation.
- The existing Line 7 connects to the Canberra Substation but not the Stockdill Substation. The new Line 7 would replace the existing Line 7 connection at the Canberra Substation and would not connect to the Stockdill Substation. The Line 7 conductors would ultimately be installed along spare arms on Line 3C to become a second circuit on Line 3C. This connection is subject to separate approvals.

Operation of the Proposal is not expected to change the existing EMF conditions on surrounding properties and would not pose a risk to the community.

15.4.3 Mitigation and Management Measures

The Proposal has been specifically designed to avoid residences and commercial buildings, and to have an appropriate clearance height to ensure that EMF exposure levels are below the relevant guidelines.

EMF modelling was undertaken to ensure maximum load conditions and maximum line ratings of the Proposal will be consistent with the ICNIRP guidelines. This included a review of existing fences and other metallic infrastructure located along the new alignments. Existing known infrastructure will be subject to further investigation during detailed design to ensure that above ground and underground metallic objects are isolated and electrocution risks to construction personnel are minimised. All metallic infrastructure that is within one of the new transmission line easements will be tested to ensure that the earthing and isolation complies with Transgrid fencing guidelines (Transgrid, 2016).

Additionally, construction areas will be securely enclosed during construction to prevent unapproved access to the site. Security fencing will be installed as early as possible during construction, and only dismantled in the final stages of construction once equipment has been removed from site.

Commissioning of the new alignments will involve testing (low voltage current injection testing) to verify that the transmission lines have been adequately earthed and whether there are any hazards (e.g. metallic structures) that need to be mitigated which were not identified during the Proposal's design stage. Contractors will have this requirement written into their scope of work beyond standard approaches to achieve best practice, as is done for other Transgrid construction projects such as the Stockdill Substation.

To summarise, the following hierarchy has been followed to avoid and minimise potential EMF impacts of the Proposal:

- Structures other than those associated with the Transgrid transmission lines will not be within a 17 m ground exclusion zone either side of each transmission line's centre line.
- The new alignments were sited to avoid residences and commercial or industrial buildings such as the LMWQCC, thereby minimising the risk of public exposure.
- Tower heights have been selected to ensure the powerlines would have appropriate clearance above the ground and that EMF exposure levels would be below the relevant reference levels.
- All fences passing within the easements of the new alignments will have isolation panels installed and be earthed as per Transgrid fencing guidelines (Transgrid, 2016).
- All metallic infrastructure that crosses or runs parallel to an easement of the new alignments will be tested to ensure that the required earthing and isolation is in place.

15.5 Utilities Assessment

Construction of the Proposal could cause damage to utilities and other essential infrastructure in the vicinity of the Proposal Area. Several utilities exist in the Proposal Area and surrounds which could be impacted directly (e.g. during construction) or indirectly (e.g. from increased traffic levels).

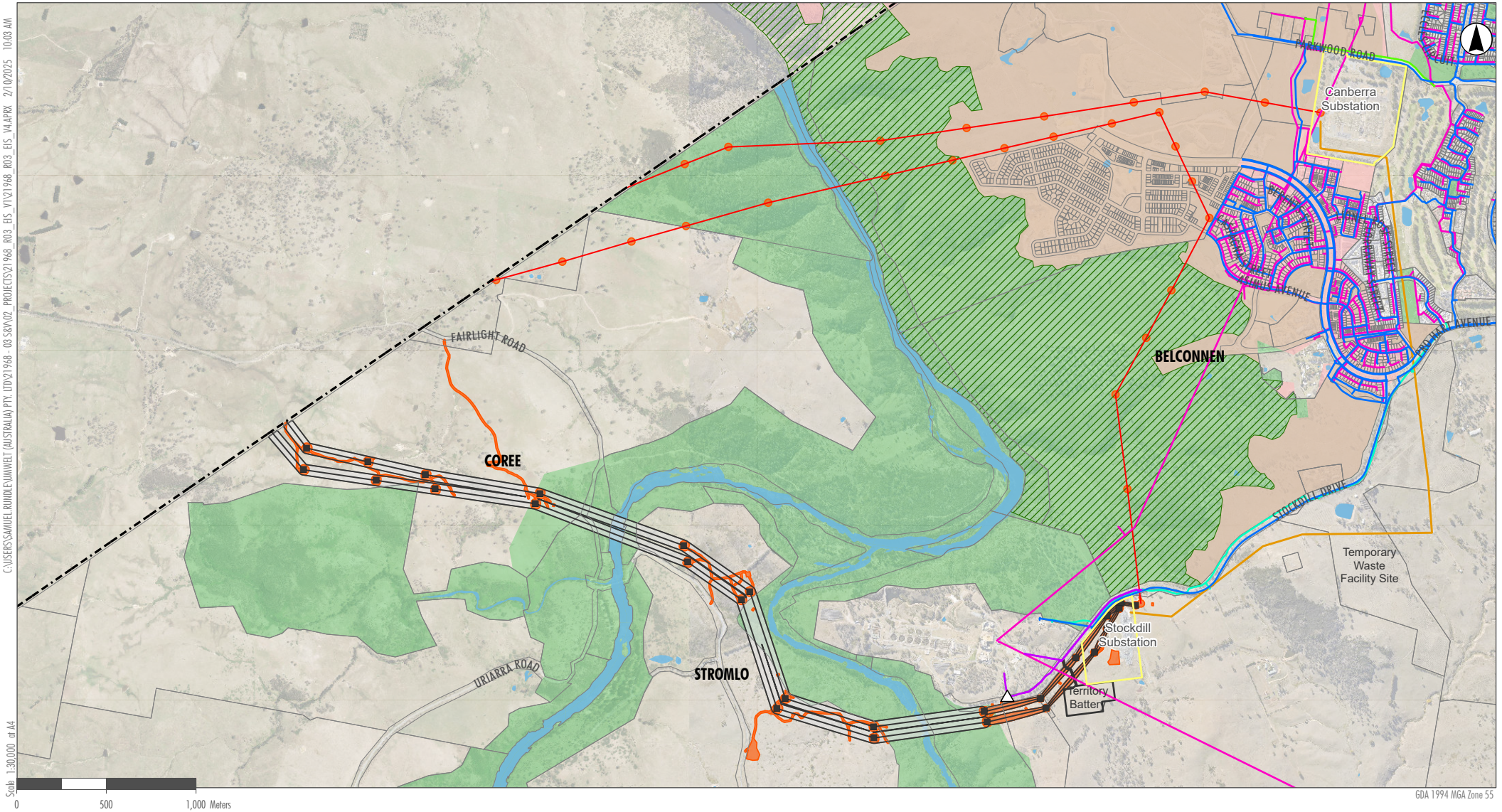
15.5.1 Existing Utilities

As shown in **Table 15.3**, eight existing utilities are known to be located within 1 km of the Proposal Area, including the Stockdill and Canberra Substations, LMWQCC, and sewerage pipelines and a water main adjacent to Stockdill Drive which connect to the LMWQCC. Two new utilities are also under development near the Proposal Area, including the proposed ACT Government temporary green waste facility on Block 1582 Belconnen, and Neoen's proposed Territory Battery project on Blocks 1634 and 1635 Belconnen. These utilities are shown on **Figure 15.4**.

Table 15.3 Existing and Proposed Utilities within 1 km of the Proposal Area

Utility / Infrastructure	Owner	Description	Proximity to Proposal
Line 3C	Transgrid	Existing transmission line connecting Canberra Substation and Stockdill Substation.	Immediately adjoining the Proposal Area.
Proposed additional conductors on Line 3C	Transgrid	Additional conductors would be strung along Line 3C between the Canberra Substation and Stockdill Substation (refer **Section 15.5.2.1**)	Immediately adjoining the Project Area. Will ultimately connection the new Line 7 to the Canberra Substation.
Stockdill Substation	Transgrid	Electrical substation, part of the high voltage transmission network in the NEM	Located within the Proposal Area. The new Line 1 would replace the existing Line 1 connection at the Stockdill Substation.
Canberra Substation	Transgrid	Electrical substation, part of the high voltage transmission network in the NEM	Located within the Proposal Area. The new Line 7 would replace the existing Line 7 connection at the Canberra Substation.
LMWQCC	Icon Water	The ACT's main wastewater treatment plant	The LMWQCC is located north of the new alignments at the western end of Stockdill Drive, adjacent to the Molonglo and Murrumbidgee River confluence.
Sewerage pipelines	Icon Water	Sewerage pipelines which connect to the LMWQCC	Spatial data provided by Icon Water and Dial Before You Dig (DBYD) indicate that sewerage pipelines are located in the eastern end of the Proposal Area. A 2.55 m-diameter sewer gravity main (see **Figure 15.4**) passes beneath the new alignments near Stockdill Drive on Block 1634 Belconnen, at a depth of at least 35 mbgl, and beneath a section of existing Line 1 which would be removed by the Proposal. The section of gravity main sewer which passes beneath the new alignments near Stockdill Drive is known as the Molonglo Valley Interceptor Sewer (MVIS).
Water main	Icon Water	Water pipelines which connect to the LMWQCC and which are located within the Ginninderry residential development area	A water main runs alongside Stockdill Drive between Strathnairn and the LMWQCC, and would be adjacent to the new alignments at the Stockdill Substation. A network of residential water mains is also located within the Ginninderry residential development area, beneath Line 3C and adjacent to the section of existing Line 1 to be removed by the Proposal.

Utility / Infrastructure	Owner	Description	Proximity to Proposal
Gas pipelines	Evoenergy	A gas pipeline which connects to the LMWQCC	A 110 mm-diameter gas pipeline is located alongside an unused gas pipeline parallel to the northern edge of Stockdill Drive, adjacent to the Stockdill Substation. DBYD data indicate that it connects at two locations to the LMWQCC, but do not show how far to the east along Stockdill Drive it extends. A network of residential gas pipelines is also located within the Ginninderry residential development area, beneath Line 3C and adjacent to the section of existing Line 1 to be removed by the Proposal.
Electricity network	Evoenergy	Current and future 11kV Supply to LMWQCC	The Proposal may interact with existing 11kV overhead assets, and proposed underground 11kV assets associated with an upgraded supply to the LMWQCC to be installed and commissioned in 2026-27. The Proponent will engage with Evoenergy during detailed design, and during the development application process to ensure clearances and earthing requirements are met.
Proposed temporary green waste facility	ACT Government	Proposed relocation of the green waste drop-off facility currently located on Parkwood Road	The ACT Government is proposing to relocate the green waste drop-off facility currently located on Parkwood Road to Block 1582 Belconnen, accessed from Stockdill Drive to the northeast of the Stockdill Substation. Construction is anticipated to begin at the end of 2024 and be completed in 2025. Line 3C passes through Block 1582. It is not known which sections of the block would be developed for the green waste facility and where its exact location would be relative to the Proposal.
Proposed Territory Battery project	Neoen	A proposed standalone battery facility with up to 300 MW capacity	Neoen is proposing to construct and operate a battery energy storage system on Block 1634 Belconnen which would connect to the Stockdill Substation. The new alignments would pass over the access road into the facility.
Unregulated farm dams	Private	Presence of numerous farm dams within Proposal Area	In addition to these utilities, the proposed alignment passes over several privately owned unregulated dams. These are considered to form part of the network of existing water infrastructure within the locality.



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Legend

- Transmission Lines to be Removed
- Line 3C Alignment – subject to separate approvals
- New Alignments
- Construction Footprint
- Property Boundaries
- Substation Boundaries
- ACT/NSW Border
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Sewer gravity mains
- Sewer pressure mains
- Effluent mains
- Water mains
- Gas pipeline
- Isolation valve - Gas

FIGURE 15.4

Existing and Proposed Utilities Near the Proposal Area

Image Source: Nearmap (2022) Data source: ACT Government (2024), Icon Water (2024), Evoenergy (2023), DBYD (2023)

15.5.2 Potential Impacts

The Proposal would interact with existing utilities. The Line 1 connection at the Stockdill Substation would be replaced with the new Line 1, and the Line 7 connection at the Canberra Substation would be replaced with the new Line 7. In addition, the new Line 7 would be strung along spare arms on Line 3C to become a second circuit on Line 3C. These connection works would be undertaken by suitably qualified and experienced Transgrid personnel, to ensure minimal interruption to the operation of the substations. Specific discussion on this is included throughout the EIS and in **Section 15.5.2.1.**

Impacts during operation of the Proposal would be limited to any maintenance work that may be required on the transmission lines.

Construction of the new tower footings and demolition of the existing towers would likely require the use of vibration-generating equipment such as vibratory rollers and hydraulic hammers. This equipment has the potential to impact nearby utilities through ground-borne vibrations, potentially causing structural damage. The utilities most at risk include the underground services adjacent to Stockdill Drive (sewerage, gas and water pipelines; see **Figure 15.4**). However, as discussed in **Section 10.4.2**, these utilities are located outside the minimum safe vibration working distances and no vibration impacts are anticipated during Proposal construction. The depth of the MVIS (35 mbgl) is expected to ensure its protection during the minor ground works associated with erecting new poles in this location.

The Proposal would not have any direct impacts on the LMWQCC due to the distances between the Proposal activities and this infrastructure. The Proposal is also not expected to have any direct impacts on the proposed Territory Battery project. The GJV and Neoen have had extensive discussions about the location of the new alignments to ensure that there would be no electrical or EMF impacts once the transmission lines are operational, and to discuss arrangements in the event that construction of the two projects is to occur concurrently (noting that the Territory Battery access road from Stockdill Drive would also be used by construction vehicles for the Proposal).

As discussed in **Section 2**, nearby utilities are unlikely experience loss of power during connection works. Transgrid would undertake the connection works over 24 hours in Spring or Autumn when there is low electricity demand. This will ensure that there is sufficient back-up on other parts of the network to support the customers powered by Lines 1 and 7, thereby preventing any loss of power and disruption to those users.

The Proposal would not impact on existing privately owned dams which occur in proximity to the proposed alignment. This is due to the distance of proposed disturbance footprints to the locations of the dams, and the nature of the dams being sturdy structures which are not easily susceptible to damage associated with ground-borne vibrations. Further, dams would be protected from indirect impacts (such as sedimentation) through implementation of appropriate controls in the Proposal's ESCP and CEMP (such as runoff management measures).

On-site personnel associated with the LMWQCC and Stockdill and Canberra Substations may be indirectly impacted by noise and increased traffic levels during construction and demolition works that are part of the Proposal. As discussed in **Section 10.4.1.1**, the LMWQCC may be exposed to construction noise during site preparation works, construction of the new towers, and demolition of the existing lines. The key transit routes in the Proposal Area (including Stockdill Drive and Parkwood Road which are used to access the

LMWQCC and Stockdill and Canberra Substations) would be operating with considerable spare capacity during the Proposal's construction and demolition periods, and the Proposal's construction and demolition vehicles are not expected to increase traffic congestion. However, there could be localised and temporary impacts if utility staff are caught behind heavy vehicles transporting OSOM materials such as the tower sections. To mitigate this risk, heavy vehicles accessing the Proposal Area will be spaced evenly throughout the day where possible, instead of during peak morning and afternoon commute periods. Notice of commencement of construction will also be provided to the LMWQCC and Stockdill and Canberra Substations to provide adequate notice of any disruptions, in addition to adequate notice prior to line disconnection and reconnection.

Table 15.4 Summary of Potential Impacts of the Proposal on Nearby Utilities

Utility / Infrastructure	Potential Impacts of the Proposal	Relevant Section of the EIS
Stockdill Substation and Canberra Substation	• Noise and vibration impacts to onsite personnel during construction • Temporary traffic impacts to onsite personnel during construction • Disruption to electricity supply during connection of new lines	Section 2.3 – Construction Methodology Section 10 – Noise Impacts Section 11 – Traffic Impacts
LMWQCC	• Noise and vibration impacts to onsite personnel during construction • Noise and vibration impacts to infrastructure during construction • Visual impacts to onsite personnel • Temporary traffic impacts to onsite personnel during construction • Disruption to electricity supply during connection of new lines	Section 2.3 – Construction Methodology Section 9 – Visual Impacts Section 10 – Noise Impacts Section 11 – Traffic Impacts Section 15 – Hazard and Risk (including utilities)
Water and Sewer Assets	• Construction vibration impacts • Physical damage during excavation	Section 10 – Noise Impacts Section 15 – Hazard and Risk (including utilities)
Electricity Assets	• Conflict with clearances and earthing requirements	Section 15 - Hazard and Risk (including utilities)
Unregulated farm dams	• Sedimentation impacts	Section 6 – Soil and Contamination

15.5.2.1 Additional Conductors on Line 3C

The Proposal would facilitate the need for additional conductors on Line 3C. This has been discussed throughout the EIS due to the works being required as a result of the Proposal, therefore impacts associated with construction and operational noise, and visual and amenity specifically consider Line 3C as facilitated impact.

The new conductors would extend Line 7 from the end of the new alignment adjacent to the Stockdill Substation, to the Canberra Substation where it would replace the existing Line 7 connection, thereby resulting in no change to the electrical configuration of either substation.

The stringing of Line 3C would occur, subject to separate approvals, prior to the construction of the Proposal. Construction would be undertaken in the following manner.

Brake and winch equipment would be used to string the additional conductor along Line 3C. This equipment would be transported around site on the back of a Hiab truck. Seven utes would be required to transport construction personnel between tower locations, with one Franna crane, two 50 m elevated work platforms (EWPs), and one 10 t Hiab truck required for the stringing. Refer to **Plate 15.3** for examples of these machines.

Brake and winch (from GJV)

EWP (Machmall, 2023)

Hiab truck (Banks Crane Hire, 2023)

Plate 15.3 Example Construction Vehicles for Conductor Stringing

The stringing would be undertaken in accordance with the following general methodology, noting that the construction methodology will be subject to detailed design and confirmation by the construction contractor once engaged.

1. The brake and winch are set up on the brake and winch pads in line with the pulling direction between towers/poles, with the conductor drum set in the drum carrier behind the brake. This is shown in **Plate** 2.3**,** in which the round conductor drums have been mounted behind the brake (the yellow machine), and the conductors are running from the tower to the brake. Error! Reference source not found. also demonstrates this brake and winch setup, where the conductor is being pulled from tower 1 to tower 2. The winch is set up near tower 2 to pull the conductor from tower 1, where the brake is set up.

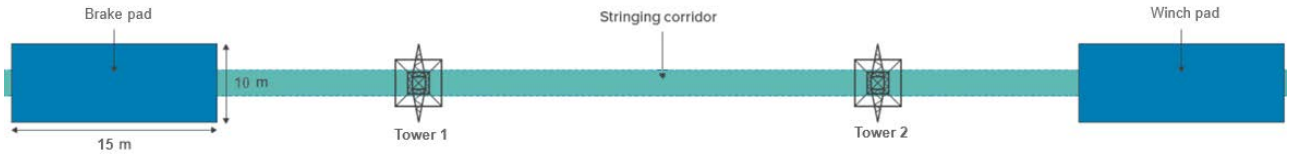


Plate 15.4 Example Brake and Winch Setup (from GJV)

2. A draw wire or rope is run through the towers being strung, and connected to the winch on one end and the conductor at the brake end. The draw wire is run along the ground between the towers, with protective ‘hurdles’ used for crossing fences and other infrastructure to prevent any damage from occurring when the draw wire is tensioned to pull through the attached conductor (see step 3).
3. Winching is commenced to the draw wire to increase the tension on the draw wire and attached conductor. The conductor is then pulled through to the winch tower under sufficient tension to ensure that it does not touch any obstructions such as trees or the ground.

4. Additional conductor drums are used to ensure that the conductor is long enough to reach the winch tower. If required, conductors are joined together using jointing sleeves installed at the brake tower.
5. Once the conductor is in place, it is secured to the brake and winch towers and the tension controllably released or increased to achieve the designed level of sag (the sag is the amount of 'drooping' between towers and prevents damage to the cables during changes in temperature (which causes the cables to expand or contract) or during weather events such as storms and high winds).
6. Once the sagging is complete, the conductor is cut and attached to the brake and winch towers at the required tension.

The construction and operation of Line 3C was assessed and approved as part of the ACT Second Electrical Supply Project (WSP, 2018a). However, the EIS for that project involved the stringing of three conductors along Line 3C. As three additional conductors are required, these will be subject to separate approvals.

The construction footprint associated with conductor stringing for Line 3C would be limited to the brake and winch pads and access tracks. However, the brake and winch pads would be in the same locations as those assessed under the ACT Second Electrical Supply Project, and existing access tracks would be used, so no direct impacts on areas not previously assessed would occur.

This EIS considers potential facilitated impacts associated with the additional conductors, including noise (see **Chapter 10.0**), and visual amenity impacts (**Chapter 9.0**). Visual impacts resulting from the conductor stringing for Line 3C have been assessed as low, and noise impacts are anticipated to be short-term, related largely to operational corona discharge for the first few years following installation (**Section 10.4.1.3**).

15.5.3 Mitigation and Management Measures

All utilities in the vicinity of the Proposal Area will be marked on site plans and communicated to construction personnel during site inductions and toolbox talks. The locations of these utilities will be verified prior to excavation. Engagement with Icon Water and Evoenergy will continue during detailed design to deconflict any clearance or earthing concerns.

The CEMP will include protocols for communicating to adjacent utility owners about construction work that could impact each of the utilities listed in **Table 15.3**. Information to be provided to utility owners will include the nature of the work (e.g. excavation, heavy vehicle traffic movements), timing of the planned work (dates and time of day), and contact details for the GJV/Transgrid and head construction contractor. The GJV will continue to engage with the relevant utility owners throughout the life of the Proposal as required.

Potential indirect impacts on nearby utilities and utility staff relating to construction vibration, noise and increased traffic from the Proposal, will be mitigated and managed in accordance with the measures specific to each matter. Refer to **Section 10.5** for more information on noise and vibration mitigation measures and **Section 11.5** for the traffic mitigation measures.

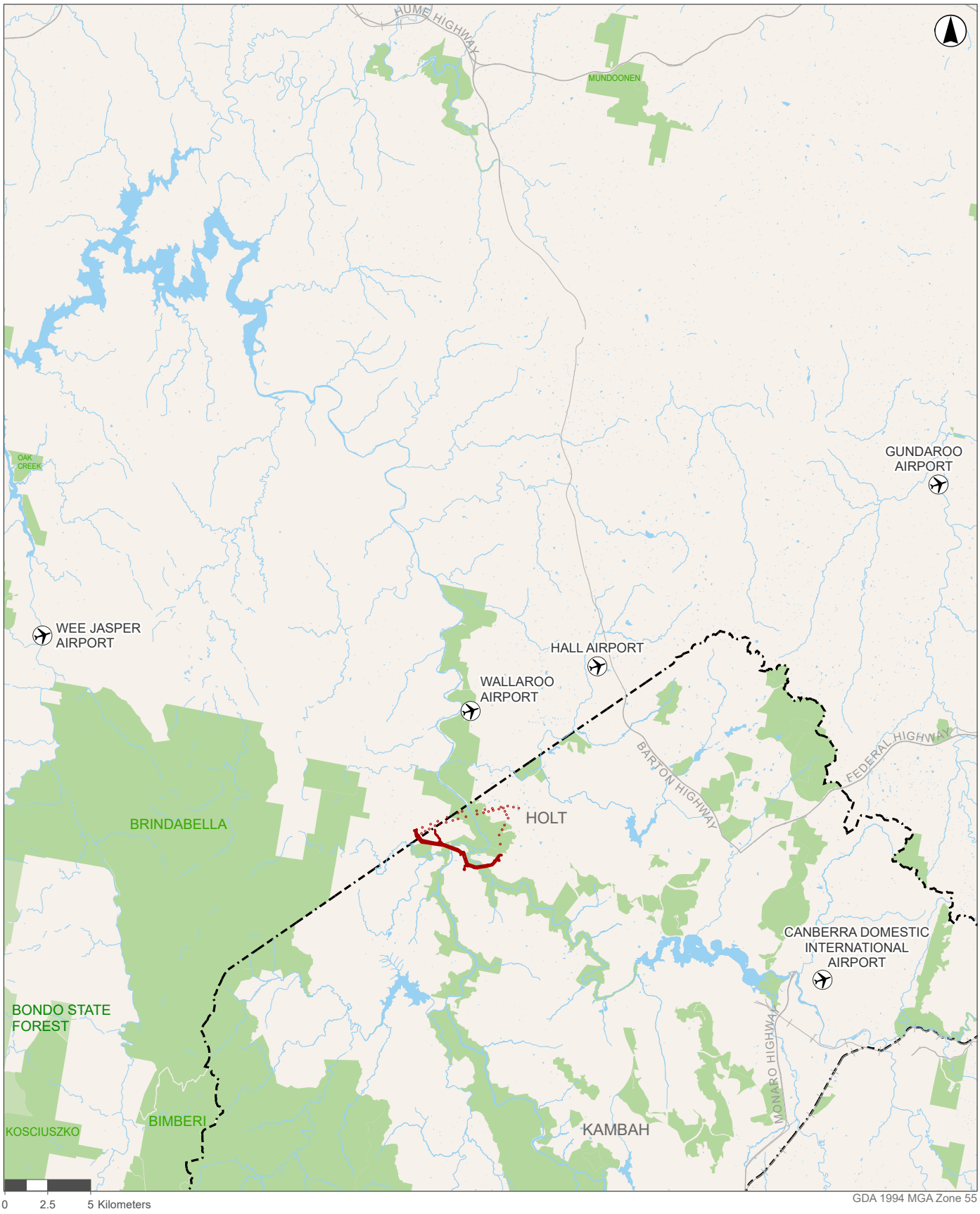
15.6 Aviation Risk Assessment

The Scoping Document requires that the risk of aircraft collision be considered in relation to the new transmission lines (see **Appendix A**). Airports or airstrips known to be within 30 km of the Proposal Area are listed in **Table 15.5**. Only the Canberra Airport is a public airport; all other airports are small private airstrips which generally only have a single runway (the exception is Gundaroo Airport which has the main bitumen

runway and a smaller perpendicular grass runway). As shown in **Figure 15.5**, Wallaroo Airstrip is closest to the Proposal (5.7 km (3.1 nautical miles (nm)) to the north). Only the Canberra Airport has instrument procedures.

Table 15.5 Airfields Near the Proposal Area

Airport Name	Location Relative to Proposal	Type of Airport	Runway Details
Wallaroo Airstrip (AU-0311)	5.7 km to the north	Private	Satellite imagery indicates NE/SW, bitumen
Hall Airport (YHAL)	9.4 km to the northeast	Private	Satellite imagery indicates NE/SW, bitumen
Canberra Airport (YSCB)	20.0 km to the southeast	Public, international airport	Runway 17/35: 168°/348° (SSE/NNW), 2.98 km, bitumen Runway 12/30: 117°/297° (ESE/WNW), 1.68 km, bitumen
Wee Jasper Airport (YWJS)	24.4 km to the northwest	Private	Satellite imagery indicates NNW/SSE, grass
Gundaroo Airport (YGDO)	30.9 km to the northeast	Private	Runway 18/36: Approx. S/N, 1.09 km, bitumen Runway 09/27: Approx. E/W, 0.42 km, grass



Legend

- Proposal Area
- ACT/NSW Border
- Road
- Nature Reserve
- Nature Reserve
- Watercourses
- Drainage Line
- Airport

FIGURE 15.5

Airfields Near the Proposal Area

Image Source: **Data source:** Geoscience Australia; Forestry Corporation of NSW (2019); DSFI (2020); NPWS Estate (2019); State Government of NSW and Deparement of Planning, Industry and Environment (2020); ACTMAPi (2022)

The Proposal is located below Class C airspace, which is the controlled airspace surrounding a major airport such as the Canberra Airport (Airservices Australia, 2024). Aircraft operating under both Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) are permitted within Class C airspace and must communicate with air traffic control.

The Obstacle Limitation Surface (OLS) is a plane in the airspace that defines the desired limit to which objects may project into the airspace around a runway so that aircraft operations may be conducted safely. The Procedures for Air Navigation Services - Aircraft Operations (PAN-OPS) Surface is another plane that guarantees a certain minimum obstacle clearance for aircraft. Under some circumstances buildings may be permitted to penetrate the OLS, but cannot be permitted to penetrate a PANS-OPS surface.

It is not known precisely what the OLS or PAN-OPS Surface levels are for the Canberra Airport, however the OLS addresses collision risk for aircraft during take-off and landing so is typically close to the airport, within around 15 km. The PAN-OPS surface would be above this. As the Canberra Airport is more than 20 km from the new alignments and there is existing transmission infrastructure within the Class C airspace near the Proposal Area, the new alignments are expected to be permissible. This will be confirmed with Airservices Australia once detailed design has been finalised.

Other airfields in the vicinity of the Proposal Area are private airports which would likely be utilised by small, light private aircraft that rely on the VFR (visual cues) for flight. Wallaroo Airstrip and Hall Airport are the closest private airports to the Proposal. Both are located on rural farmland on the rolling plains adjacent to the Murrumbidgee River, in a similar landscape context to the new alignments and to the existing lines. As these airports are located to the north of the existing lines (see **Figure 15.5**), any aircraft travelling south towards the Proposal Area would need to navigate the existing lines. As the Proposal would relocate these lines rather than introduce new transmission lines into the landscape, the Proposal would not create a new aviation risk but would instead change the location of the risk. As such, the GJV or Transgrid will engage with the EPSDD to understand the ACT's requirements for addressing the aircraft risk of transmission lines (DITRDCA, 2024). This is expected to involve notifying the nearby airfields about the changed transmission line locations prior to construction commencing on the Proposal.

It is understood that aerial firefighting is conducted at low level using specialist aircraft under the VFR. Pilots are required to maintain forward visibility with the ground so that they can accurately and safely drop fire retardant. The GJV will liaise with the ESA (e.g. ACT RFS and Fire and Rescue (F&R)) to ensure their records are updated with the new transmission line locations.

Given the presence of existing transmission lines in the landscape, notifying nearby airport operators and relevant authorities (e.g. Airservices Australia, ACT RFS) about the changes to the transmission line locations is considered appropriate to mitigate the aviation risk of the new alignments.

15.7 Residual Risk Assessment

The residual risk assessment in **Table 15.6** provides revised risk ratings with consideration of the mitigation and management measures discussed in **Section 15.3.3**, **Section 15.4.3**, **Section 15.5.3** and **Section 15.6**. Residual risk ratings range from very low to high, with all risks able to be reduced to ALARP. Significant residual risks are associated with fire spread impacts in the event of a fire in the Proposal Area, and safety risks of people working with high voltage infrastructure, accessing the site without approval or aircraft collision. Although these events would be highly unlikely to occur, the consequences could be catastrophic due to the risk to life. This gives a residual risk rating of medium or high for these risks, which cannot be further reduced.

Table 15.6 Residual Assessment of Risks Associated with Hazards and Risks

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Construction								
HR1	Sparks from construction machinery, vehicles or electrical works start a fire, resulting in fire spreading into the surrounding landscape.	Very high	No	• All Proposal equipment will be regularly maintained to minimise the possibility of faults or failure and the risk of ignition. • Access tracks will be designed to accommodate fire-fighting appliances in accordance with the Transgrid transmission line access standards and NSW RFS Fire Trail Standards, to ensure fire-fighting appliances can access the Proposal Area in the event of a fire. Design standards to be achieved include: o Access tracks to have a minimum width of 4 m and be at least 6 m-wide where passing bays are located. o Access tracks to be designed and constructed to withstand the 40 t load capacity of Transgrid maintenance vehicles and fire-fighting appliances. o Site access gates to have a minimum opening width of 3.6 m. • Industry best practice CEMP will be implemented that includes a BEMOP that documents the control measures for managing fire-related risks during Proposal, including: o Detailed measures to prevent or mitigate fire ignition, such as:	Remote	Catastrophic	Medium	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				▪ A suitable fire response tanker trailer, 30 m fire hose and nozzle, and two rake-hoes will be provided at each construction compound. Each tanker will have a minimum water storage capacity of 1,000 L. ▪ All construction vehicles and machinery will be equipped with portable fire extinguishers. If emergency work is required during extreme or catastrophic fire danger weather, the ACT RFS will be contacted to arrange for construction staff to be accompanied if required. o Work that should not be carried out during total fire bans, including the use of heavy earthmoving equipment and hot works such as grinding and welding. o Location and availability of fire suppression equipment, access and water. o Storage locations of fuels and other flammable materials. o Appropriate procedures for construction personnel to follow in the event of a fire. The BEMOP will document the following minimum requirements: ▪ Name and location/address of assets. ▪ Proponent/construction contractor contact details (including phone number). ▪ Number of employees/contractors.				

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				▪ Details about the primary action in the event of a fire (evacuate or take shelter), including the location or address of the primary action. ▪ Details about back-up/pre-emptive procedures, including the location or address. ▪ Assembly point(s) and/or transportation arrangements for an evacuation. ▪ Action statements before, during and after a bushfire. ▪ Site layout of the Proposal, including the location of construction compounds. ▪ Employee list and contact details.				
HR2	Unapproved access to site leads to injury or death through contact with electrical equipment.	High	No	• Construction areas will be securely enclosed during construction to prevent unauthorised access to the site, with a security fence to be installed as early as possible following civil works, and only dismantled in the final stages of construction once equipment has been removed from site. • Vehicular access will only be possible along the dedicated site access roads via dedicated access gates, which will be locked when personnel are not on site (but available for use by host landholders). • Warning signs, security cameras and lighting will be used to further deter unapproved access.	Remote	Catastrophic	Medium	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
HR3	Working with high voltage infrastructure places construction workers at risk of injury or death.	Very high	No	• Only suitably qualified and experienced workers will be employed to work with energised high voltage infrastructure. Workers with be provided the necessary training and safety equipment. • Cables will not be energised until construction has been completed. • Appropriate testing will occur on existing cables prior to disconnection and demolition to confirm that cables are not energised. • Construction personnel will comply with all relevant standards during construction of the Proposal.	Remote	Catastrophic	Medium	Yes
HR4	Construction activities result in unintended damage to existing utilities and other essential infrastructure.	Medium	No	• All utilities in the vicinity of the Proposal Area will be marked on site plans and communicated to construction personnel during site inductions and toolbox talks. The locations of these utilities will be verified prior to excavation. • The Proponent will engage with Evoenergy and Icon Water during detailed design to deconflict clearance and earthing requirements. • Only Transgrid staff or Transgrid-approved contractors will be permitted to undertake line connection works at existing Transgrid substations and for cut-over of existing Lines 1 and 7 to the new lines. These personnel will be appropriately trained, competent and inducted to work on the electrical infrastructure.	Remote	Major	Low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				• All proposed equipment will be regularly maintained and serviced in accordance with manufacturer requirements to minimise the possibility of failure and associated safety risks, such as the risk of fire ignition. • Construction personnel and contractors will comply with all relevant standards during design, construction, and maintenance to ensure that the Proposal operates efficiently and as intended. • Potential indirect impacts on nearby utility infrastructure or staff arising from vibration, noise and increased traffic from the Proposal, will be managed in accordance with the measures provided for N1 and N2 (**Table 10.10**, **Section 10.6**), and T1 and T2 (**Table 11.6**, **Section 11.6**). • The CEMP will include protocols for communicating with utility owners about work being undertaken in proximity to their facilities. Information to be provided will include the nature of the work (e.g. excavation), timing of the planned work (dates and time of day), and contact details of the Proponent and the construction contractor.				
Operation								
HR5	Sparks from maintenance machinery, vehicles or electrical works start a fire, resulting in fire spreading into the surrounding landscape.	Very high	No	• Refer to mitigation and management measures listed for HR1. • Transmission line easements will be regularly inspected during the fire danger period, and the grassland vegetation managed to maintain a	Remote	Catastrophic	Medium	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				maximum height of 200 mm when the grassland vegetation reaches 70% cured. • All Proposal equipment will be regularly maintained and serviced in accordance with manufacturer requirements to minimise the possibility of failure and associated safety risks, such as the risk of fire ignition. The GJV and Transgrid (including contractors) will comply with all relevant standards during maintenance to ensure that the Proposal operates efficiently and as intended.				
HR6	Unapproved access to site leads to injury or death through contact with electrical equipment.	Medium	No	• Hazardous electrical equipment will not be accessible to the general public. Ladders on the towers/poles will be locked to prevent unapproved persons from climbing the structures and making contact with energised conductors. The substations will be enclosed in high security fencing with warning signs, security cameras and lighting to be used to further deter unapproved access.	Remote	Catastrophic	Medium	Yes
HR7	Maintenance of Proposal components is not undertaken appropriately or effectively over the life of the Proposal, resulting in increased bushfire risk to the surrounding landscape and/or the system not operating as designed.	Low	No	• All Proposal equipment will be regularly serviced in accordance with manufacturer requirements to minimise the possibility of failure and associated safety risks. • The Proposal will be designed, constructed and maintained in accordance with all relevant Australian and Transgrid standards, which will help ensure that it is operating efficiently and as intended. • The transmission lines and associated easements will be managed in accordance with the Transgrid	Remote	Moderate	Very low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				Line Clearance Management Plan July 2021–June 2026, or as revised.				
HR8	Impacts on human health and safety from exposure to electromagnetic fields (EMF) and frequencies associated with high voltage powerlines.	Medium	No	• The new alignments have been designed to minimise potential EMF impacts of the Proposal where practicable, in accordance with the following hierarchy: o Structures other than those associated with the Transgrid transmission lines will not be within a 17 m ground exclusion zone either side of each transmission line's centre line. o The new alignments were sited to avoid residences and commercial or industrial buildings such as the LMWQCC, thereby minimising the risk of public exposure. o Tower heights have been selected to ensure the powerlines would have appropriate clearance above the ground and that EMF exposure levels would be below the relevant reference levels. o All fences passing within the easements of the new alignments will have isolation panels installed and be earthed as per Transgrid fencing guidelines (Transgrid, 2016). o All metallic infrastructure that crosses or runs parallel to an easement of the new alignments will be tested to ensure that the required earthing and isolation is in place.	Remote	Moderate	Very low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
				• Commissioning of the new alignments will involve testing (low voltage current injection testing) to verify that the transmission lines have been adequately earthed and whether there are any hazards (e.g. metallic structures) that need to be mitigated which weren't identified during the Proposal's design stage. Contractors will have this requirement written into their scope of work beyond standard approaches to achieve best practice, as is done for other Transgrid construction projects such as the Stockdill Substation.				
HR9	Aircraft operating in the vicinity of the Proposal collide with the new transmission lines.	High	No	• The GJV will contact the EPSDD prior to construction commencing, to clarify how the National Airports Safeguarding Framework is applied in the ACT and what the requirements are for transmission lines. • It is anticipated that the GJV or Transgrid will need to notify airport operators (e.g. for Canberra Airport, Wallaroo Airstrip, Hall Airport, Wee Jasper Airport and Gundaroo Airport) and relevant authorities (e.g. Airservices Australia, ACT RFS and ACT F&R) of the changes to the transmission line locations, so that they can update their records and ensure the new infrastructure is avoided during flights.	Remote	Catastrophic	Medium	Yes

16.0 Planning and Land Status

Chapter Summary
This chapter provides an assessment of planning and land status risks associated with the Proposal. It considers the planning context of the area where the Proposal will be located, the planning and development status of any land or project relevant to the Proposal and the land use of the proposed land and any land to be affected. Note **Section 3.0** provides the full legislative and strategic context of the Proposal.

16.1 Preliminary Risk Assessment

An assessment of Proposal risks associated with planning and land status is provided in **Table 16.1.** No significant impacts are anticipated, with the risk ratings ranging from very low to low.

Section 16.2 to **Section 16.4** provide a detailed assessment of these risks. The residual risk assessment in **Section 16.6** provides revised ratings for each risk based on the mitigation and management measures described in **Section 16.5**.

Table 16.1 Preliminary Assessment of Risks Associated with Planning and Land Status

ID	Risk Scenario	Preliminary Risk Assessment			
		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Design					
LU1	Proposal is not consistent with land use zoning for the area.	Remote	Moderate	Very low	Yes
LU2	The location of the Proposal limits future land uses and management activities, hindering future development and use of surrounding land.	Unlikely	Moderate	Low	No

16.2 Investigations

A desktop assessment was undertaken to identify the existing planning and land status for the Proposal Area and surrounds. This was undertaken early in project planning, and is described in detail in **Section 3.0.**

16.3 Planning and Policy Context

As discussed in detail in **Section 3.2.2**, although the Territory Plan 2008 was repealed by the Territory Plan 2023 on 27 November 2023, upon advice from the EPSDD, this EIS considers the Territory Plan 2008 to ensure consistency with the Scoping Document. The Proposal Area is classified as Territory Land and passes through several properties which are either subject to a private lease or managed by ACT Government entities such as PCS or TCCS.

The new alignments are located across non-urban land use zones (NUZ2, NUZ3 and NUZ4; see **Table 2.2** and **Figure 2.2**). The objectives of these zones are primarily to conserve the non-urban values of the land, notably the rural landscape of NUZ2, the hill system of NUZ3, and the river corridors in NUZ4, and to ensure land development is compatible with these values. Under the Territory Plan, the Proposal is categorised as a 'Major Service Conduit' (comprising transmission lines with a voltage greater than 66 kV), and is permissible with development approval in all three land use zones.

Removal of the existing lines across both non-urban, and urban land use zones. The Proposal is permissible in both these zones.

- During preparation of this EIS, District Strategies were released by the ACT Government. The Proposal Area is covered by the Belconnen District Strategy. The Belconnen District Strategy defines a number of directions for the Belconnen District. Of relevance to the Proposal Area, are:
- Blue-green networks:
    - Protect and enhance woodland values between Aranda Bushland and Woodstock nature reserves.
- Sustainable neighbourhoods:
    - Develop Ginninderry as an exemplar 21st century community based on sustainable neighbourhood objectives.

To achieve these directions, the Strategy defines three categories of change areas, being:

- Category 1 – Change areas where detailed planning can proceed, consultation needs to occur, and change could happen within 0–5 years.
- Category 2 – Change areas where detailed planning can proceed, consultation needs to occur, and change could happen within 0–10 years.
- Category 3 – Change areas where detailed planning can be considered, consultation needs to occur, and change could happen within 0–15 years.

The Proposal will be located across areas mapped as 'sensitive ecological communities', and part of the 'urban ACT ecological network' on the District Strategy's Blue-green network, however will not significantly impact on woodland values within this network (**Section 5.0**).

The Proposal interacts with two Category 1 Change Areas within MacNamara and Strathnairn, where removal of the existing transmission lines will increase land availability and affordability, and amenity, helping to achieve the above direction of developing Ginninderry as a sustainable neighbourhood.
No Change Areas are proposed within or in close proximity of the new operational footprint of the Proposal that would be hindered by its presence.

16.4 Potential Impacts

The construction of new transmission lines could potentially impact on land availability for urban development in the future, however the rural zones within the new operational footprint are not identified as future Change Areas under the Belconnen District Strategy, nor future urban areas under the Territory Plan. In addition, permanent infrastructure already located in this area, including the LMWCC and the Stockdill Substation, and the nature reserves along the Murrumbidgee and Molonglo River corridors preclude future urban development from large parts of the Proposal Area.

The construction of new transmission lines could also potentially impact on existing land use and management within rural properties. However, transmission lines are not a novel feature in this landscape, and rural practices, primarily grazing, can occur around these structures without disruption.
Ongoing maintenance access requirements are minimal, and with appropriate communication, access can occur without disruption to rural land uses.

Construction exclusion zones will be staged, and temporary, and undertaken in close consultation with rural landholders to minimise disruption.

16.5 Mitigation and Management Measures

The CEMP will include a Communications Plan to ensure host landholders are aware of construction timing, any exclusion areas, and ensure rural land management and activities are not affected by construction activities.

Ongoing maintenance access will be undertaken with communication with host landholders to ensure land management and activities are not affected.

16.6 Residual Risk Assessment

The residual risk assessment in **Table 16.2** provides revised risk ratings with consideration of the mitigation and management measures discussed above. Residual risk ratings range from negligible to very low, with all risks able to be reduced to ALARP.

Table 16.2 Residual Assessment of Risks Associated with Planning and Land Status

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
Design								
LU1	Proposal is not consistent with land use zoning for the area.	Very low	Yes	• The Proposal comes under the umbrella term 'major utility installation' in the Territory Plan, with the new transmission lines classified as major service conduits (transmission lines with a voltage greater than 66 kV). Major utility installations are permissible in all relevant land use zones of the new alignments (NUZ2, NUZ3 and NUZ4) and require a minimum assessment of merit track under the PD Act. The Proposal Area is also subject to the Belconnen District Precinct Code, which contains additional rules and criteria for the area surrounding the LMWQCC (RC1) and Belconnen Landfill and Parkwood Egg Farm (RC2). Part of the Proposal Area is subject to additional prohibited development (PD1 and PD2), namely that ancillary residential use is not permitted in zone NUZ3 or NUZ4, and that outdoor recreation facilities are not permitted in NUZ4. This is not relevant to the Proposal. As such, all uses proposed for the Proposal are permissible under the Territory Plan and the Proposal is therefore not inconsistent with land use zoning in the area.	Remote	Moderate	Very low	Yes

ID	Risk Scenario	Preliminary Risk Assessment		Mitigation and Management Measures	Residual Risk Assessment			
		Risk Rating	Is the risk ALARP?		Likelihood	Consequence	Risk Rating	Is the risk ALARP?
LU2	The location of the Proposal limits future land uses and management activities, hindering future development and use of surrounding land.	Low	No	• The Proposal Area was selected to ensure that Proposal infrastructure and construction activities would not be inconsistent with or limit existing land uses, or be overly prominent in the existing landscape. The new alignments are primarily located on farming land where existing practices (grazing) would be able to continue without disruption once the Proposal is operational, and with minimal disruption during construction. Removal of the existing lines will increase the area of land available for existing land uses in those areas, once construction is complete. • The new alignments are located on non-urban zones where residential development is not permissible. The new alignments have also been co-located amongst other utility installations as much as possible. The Proposal is therefore considered a beneficial use of the land that would not hinder future development and use of the properties or surrounding land. • Construction activities will occur in a staged manner, in consultation with rural landholder to ensure no impact to rural land management and activities. • Maintenance access will be undertaken with communication with rural landholder to ensure no impact to rural land management and activities.	Unlikely	Minor	Very low	Yes

17.0 Community and Stakeholder Engagement

Chapter Summary

This chapter details the engagement process being implemented for the Proposal with key stakeholders and the broader community. It identifies the engagement activities that have occurred to date and those which are planned for future stages of the Proposal, and summarises the outcomes of engagement activities already undertaken.

17.1 Engagement Objectives

Stakeholder and community relations for the Proposal have been led by the GJV's project manager with support from community relation specialists within the GJV. The GJV has developed a needs-based approach for guiding the implementation of its Stakeholder Engagement Plan (see **Appendix I**), which reflects the different needs and interests of the various stakeholder groups relevant to the Proposal.

The GJV has identified appropriate methods of communication and engagement for each stakeholder group that has potential interest in the Proposal. The engagement approach has been designed to be open and responsive, with overarching goals to ensure an engaged and informed community and to obtain feedback that is able to be considered and addressed early in the Proposal's development process.

17.2 Methodology

The GJV's overarching approach to community and stakeholder engagement is as follows:

- Identify stakeholder groups and individual stakeholders with a potential interest in the Proposal (see **Section 17.3**).
- Identify appropriate engagement mechanisms for each stakeholder group, based on their needs and interests (**Section 17.4**).
- Undertake engagement activities.
- Consider feedback received and respond to stakeholders where needed (**Section 17.5**).

17.3 Stakeholder Identification

Stakeholder identification began early in the Proposal's development and is a tiered, ongoing process dependent on the character of the region (e.g. the setting – regional or big city; dominant industries, if any; key government policies; and interests of the local community).

Nine key stakeholder groups that would have an interest in the development of the Proposal have been identified. This includes host and neighbouring landholders, local community, government agencies and Members of Parliament. The first group engaged for the Proposal was the host landholders and direct neighbours, including PCS (in relation to nature reserves) and the Department of Finance, followed by other nearby landholders such as Icon Water (for the LMWQCC). Key government entities were identified through the regulatory EIS Scoping Document Application and EPBC Act referral processes.

As the Proposal has continued to develop, new stakeholders have been identified through communications with existing stakeholders and as new groups/individuals have become interested in the Proposal. In many cases, these interested parties have made contact with the GJV through the regulatory processes or as a result of advertising on the Proposal website or via community information sessions.

Table 17.1 provides the engagement objectives for each stakeholder group and the engagement activities that the GJV has identified to enable it to meet these objectives. These activities include one-on-one meetings, Proposal briefings, and information sessions.

Table 17.1 Stakeholder Engagement Objectives and Activities

Stakeholder Group	Engagement Objectives	Engagement Activities
Traditional Owners, local Indigenous communities	• The GJV is engaging with the RAOs to understand whether any elements of the Proposal are culturally relevant and/or sensitive.	• Engagement through the CHA process (refer to **Chapter 8.0** for more information).
Host and neighbour landholders / land managers	• The GJV is in ongoing communication and discussions with host landholders, seeking contributions of local knowledge and advice to guide the Proposal's development • The GJV seeks to create and maintain a close working relationship with landholders adjacent to the Proposal Area to ensure that impacts are minimised on these landholdings. This includes Icon Water, Neoen, Burns Golf Club, and others • The GJV has engaged with host landholders and near neighbours from early in the planning process and continues to provide opportunities for landholders to raise issues and provide feedback about the Proposal.	• Regular meetings. • One-on-one meetings. • Invitation to community drop-in sessions. • Access to Proposal updates via website.
Ginninderry residents	• The GJV is engaging with Ginninderry residents to seek contributions of local knowledge and advice to guide the Proposal's development • The GJV aims to keep the community informed about the Proposal from early in the planning process and provide ongoing opportunities for the community to raise issues and provide feedback about the Proposal.	• Invitation to community drop-in sessions. • Community newsletters. • Social media (e.g. Ginninderry Locals Facebook Group). • Access to Proposal updates via website.
Local ACT and NSW communities	• The GJV seeks to ensure that the local community is kept informed about the Proposal and given opportunities to provide feedback early in the Proposal's planning process.	• Invitation to community drop-in sessions. • Access to Proposal updates via website.

Stakeholder Group	Engagement Objectives	Engagement Activities
Nearby utility owners including Icon Water (also a near neighbour), Evoenergy and Telstra	• The GJV seeks to develop and maintain strong working relations with the owners and operators of nearby utilities to minimise impacts on these utilities and to provide opportunities for feedback early in the Proposal's planning process.	• Regular meetings. • One-on-one meetings.
Transmission infrastructure owner and operation (Transgrid)	• The GJV seeks to develop and maintain strong working relations with Transgrid as Transgrid is responsible for detailed design and will ultimately operate and manage the new assets.	• Regular design and operation meetings. • One-on-one meetings.
Special interest groups such as the Strathnairn Arts Centre	• The GJV seeks to create partnerships with local special interest groups that have an interest in the Proposal. The GJV is providing opportunities for groups to raise issues and provide feedback about the Proposal early in the Proposal's planning process.	• One-on-one meetings. • Community drop-in sessions. • Access to Proposal updates via website.
Government agencies	• The GJV seeks to meet the regulatory requirements of the Australian and ACT Governments while fostering a positive and collaborative relationship to achieve long-term goals for the community.	• One-on-one meetings. • Briefing sessions. • Email updates.
ACT Legislative Assembly members in the electorate of Ginninderry	• The GJV seeks to ensure that the local ACT Legislative Assembly members are kept informed of the Proposal and its progress.	• Briefing sessions • Email updates.

17.4 Engagement Mechanisms

The GJV has undertaken a range of engagement activities with various stakeholders throughout the early development stage of the Proposal, using a mix of in-person and virtual methods, as outlined in **Table 17.1**.

The various mechanisms for engagement are described below.

17.4.1 Proposal Website

The GJV has set up a website for the Proposal at https://ginninderry.com/project/proposed-transmission-line-relocation/. The website was established during the EIS process to provide clear and accessible information about the Proposal to the community. The website will continue to be updated to provide accurate information on the Proposal throughout the development process.

The Proposal website provides direction for people to provide comment on the Proposal, including:

- Direct contact via email at community@ginninderry.com.
- Direct contact via phone 1800 316 900.
- Feedback survey on the Proposal website.

- Information about upcoming community events or information sessions and other opportunities to provide feedback (e.g. during public notification of this EIS and the DA).

17.4.2 Stakeholder Meetings

The GJV has provided briefings and updates about the Proposal to a range of key stakeholders to date. The purpose of these meetings has been to introduce the GJV, discuss the Proposal and provide an opportunity for feedback on the Proposal.

The GJV has engaged with the following stakeholders through one-on-one meetings:

- Host and neighbouring landholders.
- Transgrid.
- Other nearby utility owners including Icon Water, Evoenergy and Telstra.
- Government agencies including EPSDD, DCCEEW, the Conservator's office, PCS, UTR and DoF.
- Special interest groups including the Strathnairn Arts Centre, Bush on the Boundary, and Ginninderry Conservation Trust.

Ginninderry will continue to engage with these stakeholders and others as identified in **Table 17.1** throughout the remainder of the EIS and DA process and during any subsequent stages of Proposal design, construction, and operation as required.

17.4.3 Community Drop-in Sessions

To date, the GJV has held two community drop-in sessions for the Proposal:

- 4–7 pm, Wednesday 20 November, at The Link in Ginninderry, targeting Ginninderry residents, other ACT community members and other interested stakeholders.
- 4:30–6 pm, Thursday 21 November, at Uriarra Crossing (Uriarra Recreation Reserve), targeting rural landholders in the ACT and NSW who live near the Proposal Area (e.g. off Fairlight Road).

Members of the public were invited to attend, with the events publicised through local media, letterbox drops in Ginninderry, and via the Ginninderry community noticeboard. Ginninderry current and future residents on Ginninderry's marketing database were also sent an electronic direct mail (EDM) and the sessions were advertised on both the 'Ginninderry Community' and 'Ginninderry Locals' Facebook pages. Other key stakeholders were contacted directly and personally invited to the events, including National Trail/Pony Club, CSG and Landfill representatives, and ICON water. Appendix I provides Ginninderry's Stakeholder Engagement Plan including examples of the advertising material.

The community drop-in sessions were designed to be casual events where the public could read information about the Proposal displayed on A1 corflute posters around the room and ask questions of the GJV and Umwelt Proposal team.

Attendees at the community drop-in sessions were invited to provide comments and feedback on the Proposal via an online feedback form, which was made available via QR codes on the posters and letterbox drops and is available on the website.

19 people attended The Link session, and 5 people attended the Uriarra Crossing session. To date, 39 survey forms have been submitted, with 11 comments received. The feedback from these responses and drop-in sessions is summarised in **Section 17.5.2**.

Posters and information will continue to be made public online and in The Link – Ginninderry's Project Office and Community Centre – until construction is complete.

17.4.4 EIS Public Exhibition

The EIS process includes public exhibition of the draft EIS, which provides the opportunity for any person to provide comment or feedback on the Proposal. The draft EIS was open for public exhibition between May and June 2025. No public comments were received.

17.4.5 Post-approvals

Stakeholder engagement activities would continue following approval of the Proposal. The GJV and Transgrid will continue to engage with key stakeholders prior to and during construction, particularly host and neighbouring landholders and community groups, to discuss timing of construction activities for minimising potential disruption. The GJV will provide community updates to residents of Ginninderry and surrounding areas, while Transgrid will undertake letterbox drops and provide online information as appropriate throughout construction and operation.

The GJV will also engage with local businesses to identify opportunities for local procurement, and with regulatory agencies in relation to environmental management plans. Engagement would be via dedicated meetings, emails to key stakeholders and subscribers, and website updates.

The GJV will continue to provide Proposal updates via the website once the Proposal is operational, and would manage the complaints register through the website. Prior to decommissioning, the GJV would engage with host and neighbouring landholders and regulatory authorities to discuss timing of decommissioning activities to minimise potential disruption.

17.5 Engagement Outcomes

The GJV has engaged with a range of stakeholders throughout the development of the Proposal, via the mechanisms described in **Section 17.4**. The outcomes of these engagement activities are summarised below.

17.5.1 Stakeholder Meetings

As discussed in **Section 17.4.2**, the GJV has engaged with a range of stakeholders throughout the Proposal's development via one-on-one meetings. The outcomes of these meetings are summarised below.

17.5.1.1 DCCEEW (Cwth)

The GJV has met with assessment officers from DCCEEW (Cwth) on a number of occasions, including 24 April 2024, 17 March 2022 and 19 December 2022. These pre-referral meetings introduced DCCEEW to the Proposal and discussed potential impacts and mitigations for MNES.

The pre-referral meetings had a particular focus on determining the appropriate referral/assessment pathway for the Proposal under the EPBC Act, noting the cross-jurisdictional nature of the Proposal. DCCEEW ultimately confirmed that an assessment bilateral agreement could not be used for a cross-jurisdictional project, and that the Proposal needed to be either referred in its entirety or via split referrals for the ACT and NSW components. The latter approach was chosen to allow Transgrid to self-assess under the NSW EP&A Act, which would not have been possible had the entire Proposal been referred under the EPBC Act based on initial DCCEEW advice.

Draft referrals were provided to DCCEEW for adequacy checking on 26 September 2024, with advice received on 14 October 2024 which was subsequently incorporated into the submitted referrals.

Additional information was sought by DCCEEW following the public exhibition of the referrals, with information provided on 31 January and 5 February 2025.

17.5.1.2 EPSDD

The GJV has met regularly with staff from the EPSDD since 2019, most recently on 1 March 2023. The purpose of this meeting was to brief the Impact Track team on the status of the Proposal, including potential impacts, and to update them on recent discussions with DCCEEW about the Proposal's assessment pathway. The GJV committed to submitting the EPBC Act referrals as soon as possible, with the aim of receiving DCCEEW's referral decisions prior to submitting the draft EIS to the EPSDD.

17.5.1.3 Department of Finance

The GJV has met with staff from the DoF on several occasions. Early in the Proposal's development process, the purpose of these meetings were primarily to understand how the DoF land in NSW is managed and whether there would be any restrictions on the Proposal. More recently, the GJV has sought clarity from the DoF on the assessment and approval process required for the component of the Proposal located on DoF (Commonwealth) land. The DoF confirmed that an EPBC Act referral (and assessment if required) covering a whole-of-environment assessment on Commonwealth land is needed. This was undertaken as part of the EPBC Act referral for the NSW portion of the Proposal.

17.5.1.4 ACT Government Agencies

The GJV has met with various ACT Government agencies during preparation of the EIS. **Table 17.2** provides a summary of these meetings.

Table 17.2 Summary of Proposal Meetings with ACT Government Agencies

Agency	Meeting date	Outcomes from meeting
SLA	Multiple, from March 2019 to present	SLA is the representative of the ACT Government in the GJV. Updates on the progress of the Proposal were therefore provided regularly to upper management within the SLA, and to the SLA Board, to ensure the ACT Government was kept up-to-date on potential impacts, benefits, costs and progress of the Proposal.
PCS	Multiple, from March 2021 to present	Multiple meetings were held to discuss the scope of the Proposal and potential impacts and benefits on PCS managed land. Of relevance to this EIS, the GJV committed to providing an environmental business case to PCS. The cost-benefit analysis is attached at **Appendix G8.**

Agency	Meeting date	Outcomes from meeting
Conservator	15 August 2023	This meeting was to seek clarification on some of the Conservator's comments in the EIS Scoping Document (**Appendix A**): • The Conservator's office amended their requirement for superb parrot nesting trees to be surveyed within a smaller area along the new alignments to the east of the Molonglo River (referred to as the 'superb parrot tree assessment area' in **Chapter 5.0**; see **Figure 5.2**). • The Conservator's office requested an additional round of surveys for Austral toadflax, with surveys OK to be undertaken in spring. • The Conservator's office agreed to provide maps showing recent (unpublished) modelling of GSM habitat near the Proposal to inform the Proposal's GSM impact assessment (reproduced in **Figure 5.9** and **Figure** 5.10). Changes made to the entity requirements in the Scoping Document, in agreement with the Conservator's office, have been documented in **Appendix B**.
UTR	16 August 2023	This meeting was to seek clarification on some of the UTR's comments in the EIS Scoping Document (**Appendix A**): • The GJV clarified that no changes to the line connections into the Stockdill and Canberra Substations would occur as a result of the Proposal, and that this would be clearly described in the EIS. • Because of this, UTR confirmed that energy system modelling and an impact assessment of connection changes within the substations, is not required as part of the EIS. Changes made to the entity requirements in the Scoping Document, in agreement with UTR, have been documented in **Appendix B**.
TCCS	2023	The SLA engaged with TCCS on behalf of the GJV to discuss potential impacts of the Proposal on TCCS landholdings and proposed mitigation measures.

17.5.1.5 Transmission Infrastructure Owner and Operator (Transgrid)

The GJV has held regular meetings with Transgrid throughout the Proposal's development, to determine appropriate design elements from an engineering and constructability perspective, and to avoid ecological and heritage impacts where possible. The GJV has also engaged with Transgrid in relation to the Proposal's assessment pathway on NSW land and to seek input to this EIS (e.g. in relation to the Proposal design in **Chapter 2.0**; and mitigation measures, which are summarised in **Chapter 19.0**).

17.5.1.6 Burns Golf Club Belconnen

The Burns Golf Club Belconnen is the landholder of Block 2 Section 132 Holt, where Line 3C is located. The GJV has met with representatives from the Burns Golf Club Belconnen to identify ways to minimise impacts on the golf course during stringing of the additional conductors on Line 3C (subject to separate approvals).

In consultation with Transgrid, the GJV has been able to modify the construction design to avoid placing brake and winch locations on the golf course, thereby avoiding direct impacts on the grounds. The number of vehicles required to access the golf course during construction has also been minimised to three utes and trailers at any one time. Twelve days would be needed to string the additional conductors, of which just seven days would require restricted access to the Line 3C easement on the golf course to ensure the public's safety.

17.5.1.7 Utility Owners

The eastern end of the Proposal is located in an 'infrastructure hub' where various other utilities are located, including the LMWQCC and various electrical infrastructure owned by Evoenergy and Transgrid.

Early in the Proposal's development, the GJV considered locating the new alignments closer to the LMWQCC (see C1; **Figure 2.6**). The GJV engaged early with Icon Water to understand whether this was a viable option, but Icon Water did not find it acceptable due to infringement on the northern boundary of the LMWQCC property. Icon Water was pleased with the southern alternative which would not impact on the LMWQCC (see C5; **Figure 2.6**), and this option was ultimately progressed for assessment in this EIS.

The GJV has engaged with Evoenergy in relation to potential impacts of the Proposal on Evoenergy infrastructure, including the 11 kV overhead powerlines within the Proposal Area adjacent to Stockdill Substation. Evoenergy did not raise any particular concerns or requirements for the Proposal.

The GJV regularly meets with Transgrid to discuss the design and progress of the Proposal. Design decisions have been made to ensure that the proposed realignment would be compatible with existing Transgrid assets.

17.5.1.8 Neoen

Neoen is developing the proposed Territory Battery project on Block 1634 Belconnen, adjacent to the new alignments. The GJV has met with Neoen on several occasions to discuss potential electrical constraints on the designs of both projects, and the need for land access arrangements, coordination deeds and other consents. The GJV and Neoen have come to an agreement on relevant matters and both projects are able to proceed without limitation from the other. In particular, the proposed design of the new alignments safely passes over the Territory Battery site and would not impact the Territory Battery construction activities or electrical requirements.

17.5.1.9 Special Interest Groups

The GJV has held general discussions with various special interest groups including the Strathnairn Arts Centre, Bush on the Boundary, and Ginninderry Conservation Trust. Topics covered during these discussions included the proposed scope of works and development program.

Logistics for accessing and removing existing towers was discussed with the Ginninderry Conservation Trust in detail, as they manage the GCC.

17.5.2 Community Drop-in Sessions

A number of common themes were raised during the community drop-in sessions on 20 and 21 November 2024, which are summarised below:

- Overall support regarding the removal of Lines 1 and 7.
- Minor concern over additional strings on Line 3C, largely from a visual point of view for adjacent landholders.
- Desire for the removal of lines to be completed faster than the proposed timeframe.
- Concern over visual impacts at Uriarra Crossing, mainly the placement of a tower on the top of the hill to the east of Uriarra Crossing.
- Discussion of the historical value of Uriarra Crossing, including the use of a punt in the location in the late 1800s for transporting wool across the river, prior to the construction of the first bridge.
- Concern over visual impacts from NSW rural landholders, particularly the reflective sheen of newly galvanised towers, noting that transmission lines are already a visible feature in the landscape.

A large number of attendees also asked about plans for the future of Canberra Substation, however this is not part of the current Proposal.

Attendees of the drop-in sessions were encouraged to provide additional feedback via the survey link, or during public exhibition of the Draft EIS.

17.5.3 EIS Public Exhibition

No public comments were received on the draft EIS.

18.0 Residual Risks

Chapter Summary
This chapter provides a residual risk assessment of the Proposal based on the preliminary risk ratings provided in **Section 4.2** and with consideration of the mitigation and management measures identified in **Chapter 5.0** to **Chapter 16.0**.

Table 18.1 provides the full list of risks identified in the Proposal's preliminary risk assessment (**Section 4.2**) along with the avoidance, mitigation and management measures that will be implemented to address these risks, as detailed in **Chapter 5.0** to **Chapter 16.0**. The risks that may have a significant residual impact after the mitigation measures have been applied are those with a residual risk rating of medium or higher.

A number of significant residual risks remain for the Proposal, despite all risks able to be reduced to ALARP. The significant residual risks are associated with:

- Biodiversity impacts due to unavoidable clearance of native vegetation, TECs and threatened species habitat.
- Loss of visual amenity for local residents and users of the surrounding area during construction and operation, and impacts on landscape character.
- Cumulative impacts on biodiversity and visual amenity occurring as a result of the Proposal and other developments in the region.
- Safety risks associated with bushfire ignition (e.g. caused by sparks from construction or maintenance machinery), access to high voltage electrical equipment by construction workers or unapproved persons, insufficient traffic management measures during construction and demolition, or aircraft collision.

The Proposal has a very high residual risk due to potential biodiversity impacts primarily associated with superb parrot foraging habitat and gang-gang cockatoo potential breeding and foraging habitat.
The location and design of the new alignments have been developed through an iterative options assessment process over several years to reduce environmental, cultural, and social impacts. This has resulted in the avoidance and minimisation of impacts on several key ecological values, including BGW, NTG, PTWL habitat, and mature hollow-bearing trees. Further reductions in impacts are not considered practicable or possible in some areas (e.g. in the constrained infrastructure corridor adjacent to Stockdill Drive where woodland occurs), which has resulted in the very high residual risk associated with biodiversity impacts. Compensatory measures, including planting and revegetation have been proposed to account for residual biodiversity impacts.

There are medium and high residual risks associated with potential visual amenity and landscape character impacts during Proposal construction and operation. A key focus of the iterative design process was to ensure that the Proposal infrastructure and construction activities would not be inconsistent with or overly prominent in the landscape. Impacted landholders were consulted throughout the design process, and designs with too severe of a visual impact were rejected. The final Proposal design was accepted by impacted landholders. It is therefore not viable for these residual risks to be further reduced.

The significant residual safety risks are associated with spread of a fire from the Proposal Area, safety risks of people working with high voltage infrastructure or accessing the site without approval, and aircraft collision. Although these risks are highly unlikely, the consequences could be catastrophic due to the risk to

life. This gives a residual risk rating of medium or high for these risks, which cannot be further reduced.

Table 18.1 Residual Risks Associated with the Proposal

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
Design							
A1	Potential environmental impacts are unacceptable and approval is not granted.	Low	• Current and best available information has been used to prepare this EIS and gain an understanding of the potential environmental impacts of the Proposal. • Key government authorities such as the EPSDD, DCCEEW, Conservator's office and UTR have been consulted throughout the EIS process to identify any potential issues early in the Proposal's development process. • The avoid, mitigate and compensate hierarchy has been implemented as part of the EIS process to minimise potential environmental impacts of the Proposal and identify suitable management and other compensatory measures where required. • The EIS presents a technically accurate and comprehensive assessment of environmental conditions and impacts, using a risk-based approach. It addresses all requirements of the Scoping Document and presents a Proposal that balances its environmental impacts with positive social, environmental and economic outcomes.	Remote	Major	Low	Yes
A2	Risks are not adequately identified for the Proposal, resulting in an incomplete understanding of potential environmental impacts and constraints.	Medium	• Current and best available information has been used to prepare this EIS and gain an understanding of the potential environmental impacts of the Proposal. • The EIS has been prepared using a risk-based approach. The preliminary risk assessment provided in the Proposal's Scoping Document Application has been updated throughout the EIS preparation process to ensure that all risks are identified and managed.	Unlikely	Moderate	Low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			• This EIS has been prepared to comprehensively cover all potential environmental impacts of the Proposal, thereby mitigating the risk of extensive rework following the receipt of any comments during public exhibition of the draft EIS.				
A3	Delays in approval decisions result in delayed service delivery and financial implications for the Proposal.	High	• Planning and approvals processes were commenced early in the Proposal's development to minimise the risk of impacting the Proposal's overall schedule. • This EIS has been prepared to comprehensively cover all potential environmental impacts of the Proposal, thereby mitigating the risk of extensive rework following the receipt of any comments during public exhibition of the draft EIS. • Realistic expectations have been maintained around the length of time that is required for the approvals processes and potential sources of delays. • The GJV has kept the EPSDD and DCCEEW informed of the expected date of submission for the draft EIS and revised EIS to ensure sufficient resources are available to review the EIS.	Possible	Major	High	Yes
B1	The location of the Proposal leads to unavoidable removal of threatened ecological communities and/or threatened species habitat.	Very high	• The location and design of the new alignments have been developed through an iterative options assessment process over several years to reduce environmental, cultural, and social impacts. This has resulted in the avoidance and minimisation of several key ecological values, including BGW, NTG, PTWL habitat, and mature hollow-bearing trees. Further reductions in impacts are not considered practicable or possible in some areas (e.g. in the constrained infrastructure corridor adjacent to Stockdill Drive where woodland occurs). • Compensatory planting and rehabilitation commitments have been made for unavoidable residual impacts.	Almost certain	Moderate	Very high	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
B2	Presence or extent of threatened species habitat or ecological communities or other protected matters (e.g. native vegetation) is not identified prior to the design being finalised, resulting in unanticipated impacts.	Low	• Ecological field surveys have been undertaken over the past several years to identify constraints and opportunities for redesign to avoid high ecological values. For some species, multiple years of surveys have also been undertaken (e.g. GSM, Austral toadflax). As such, it is considered highly unlikely that new ecological values are identified post-approvals.	Remote	Moderate	Very low	Yes
B3	Cumulative biodiversity impacts occur as a result of the Proposal and other developments in the region.	Medium	• Impacts on native vegetation including TECs and threatened species habitat have largely been avoided through the refinement of the location and design of the new alignments. • The CEMP will include a Site Rehabilitation Plan that details how the Proposal Area will be progressively rehabilitated throughout construction, including through the re-seeding of native grasses. This will include a rehabilitation monitoring program for measuring the effectiveness of the rehabilitation activities. • Potential cumulative biodiversity impacts will be further mitigated through the implementation of the CEMP (refer to the mitigations provided for B6–B10 for more detail).	Possible	Moderate	Medium	Yes
B4	If required, an appropriate offset site is unable to be identified or established in the ACT.	Medium	• N/A The Project will not require Offsets.	Remote	Minimal	Negligible	Yes
C1	The Proposal is non-compliant with secondary ACT legislation such as the *Environment Protection Act 1997* (EP Act).	Low	• The GJV has engaged a range of suitably qualified experts to prepare this EIS and the specialist studies to ensure that relevant legislative requirements are identified early in the Proposal's development process.	Remote	Moderate	Very low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			• The GJV will engage one or more suitably qualified experts to undertake the works needed to obtain all required approvals under ACT legislation. • The GJV will consult with relevant ACT Government agencies to ensure that all relevant approvals will be sought.				
H1	The location of the Proposal results in adverse impacts on the heritage values of European heritage places.	Very low	• No impacts are anticipated on European heritage places due to the distance between the Proposal and these places. • Any major future design changes (e.g. re-routing of the new alignments) will be reassessed in a revised CHA against the listed heritage values of the Huntly property and the nominated heritage values of the NSW/ACT border marker (or listed heritage values once these become available), to avoid adverse impacts. Advice will be sought from ACT Heritage if impacts are unable to avoided.	Remote	Moderate	Very low	Yes
L1	The location of the Proposal results in a loss of visual amenity for local residents and users of the surrounding area and impacts on landscape character.	Medium	• The location of the new alignments was selected through an iterative design process over several years to ensure the Proposal infrastructure and construction activities would not be inconsistent with or overly prominent in the landscape. Impacted landholders were consulted throughout the design process, and designs with too severe of a visual impact were rejected. These stakeholders found that the final Proposal design (assessed in this EIS) was acceptable for further consideration, demonstrating the effectiveness of the GJV's avoidance efforts.	Possible	Moderate	Medium	Yes
L2	Cumulative visual impacts occur as a result of the Proposal and other developments in the region.	Medium	• Refer to avoidance measures described for L1.	Possible	Moderate	Medium	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			• As a considerable portion of the Proposal Area contains existing utility infrastructure (e.g. the Stockdill and Canberra Substations, other high voltage transmission lines and smaller powerlines, the LMWQCC, and the proposed Territory Battery), the Proposal would not result in the addition of new elements into the landscape, thereby minimising potential cumulative impacts.				
LU1	Proposal is not consistent with land use zoning for the area.	Very low	• The Proposal comes under the umbrella term 'major utility installation' in the Territory Plan, with the new transmission lines classified as major service conduits (transmission lines with a voltage greater than 66 kV). Major utility installations are permissible in all relevant land use zones of the new alignments (NUZ2, NUZ3 and NUZ4) and require a minimum assessment of merit track under the PD Act. The Proposal Area is also subject to the Belconnen District Precinct Code, which contains additional rules and criteria for the area surrounding the LMWQCC (RC1) and Belconnen Landfill and Parkwood Egg Farm (RC2). Part of the Proposal Area is subject to additional prohibited development (PD1 and PD2), namely that ancillary residential use is not permitted in zone NUZ3 or NUZ4, and that outdoor recreation facilities are not permitted in NUZ4. This is not relevant to the Proposal. As such, all uses proposed for the Proposal are permissible under the Territory Plan and the Proposal is therefore not inconsistent with land use zoning in the area.	Remote	Moderate	Very low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
LU2	The location of the Proposal limits future land uses and management activities, hindering future development and use of surrounding land.	Low	• The Proposal Area was selected to ensure that Proposal infrastructure and construction activities would not be inconsistent with or limit existing land uses, or be overly prominent in the existing landscape. The new alignments are primarily located on farming land where existing practices (grazing) would be able to continue without disruption once the Proposal is operational, and with minimal disruption during construction. Removal of the existing lines will increase the area of land available for existing land uses in those areas, once construction is complete. • The new alignments are located on non-urban zones where residential development is not permissible. The new alignments have also been co-located amongst other utility installations as much as possible. The Proposal is therefore considered a beneficial use of the land that would not hinder future development and use of the properties or surrounding land. • Construction activities will occur in a staged manner, in consultation with rural landholder to ensure no impact to rural land management and activities. • Maintenance access will be undertaken with communication with rural landholder to ensure no impact to rural land management and activities.	Unlikely	Minor	Very low	Yes
SE1	Unanticipated public concerns or comments received during the EIS process results in rework, delays or public animosity.	Medium	• The GJV has undertaken extensive targeted consultation and broader community engagement since 2020, including: o Site walkovers and Aboriginal cultural heritage mapping with the ACT RAOs.	Unlikely	Moderate	Low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			o Regular consultation and updates with all landholders impacted by the proposed realignment works including ACT, NSW and Australian Government agencies; and commercial and private landholders. o Valuations of the proposed easements for the new alignments and offers of compensation to all affected landholders. o Community updates about the Proposal to various special interest groups. o Two community drop-in information sessions in November 2024, targeting nearby ACT and NSW residents, respectively. o Public exhibition of the EPBC Act referrals. • The GJV has aimed to engage with the community early in the Proposal's development to identify any community concerns at a time when any rework to the Proposal design or specialist technical studies will have minimal impacts on the development timeline. Stakeholders will continue to be kept up to date with any changes associated with the Proposal.				
SE2	Siting of the Proposal results in a loss of agricultural land.	Negligible	• The Proposal would result in a small loss of grazing land along the new alignments relative to the total size of the agricultural blocks and rural leases. The surrounding areas would continue to be available for grazing following completion of construction. Any loss of income associated with the loss of grazing land would be offset through the financial arrangements in place between the GJV and the landholders. The Proposal is therefore not expected to cause a loss of income to the landholders or to the broader economy.	Unlikely	Minimal	Negligible	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
SE3	Impacts on human health and safety from exposure to electromagnetic fields (EMF) and frequencies associated with high voltage powerlines.	Medium	• Refer to the mitigation measures provided for HR8.	Remote	Moderate	Very low	Yes
Construction							
B5	The area of disturbance exceeds the area assessed and approved, resulting in non-compliance with the PD Act/Planning Act approvals (and/or EPBC Act if relevant).	Medium	• Industry best practice CEMP will be implemented that documents the approved disturbance area and identifies controls for ensuring that the boundary is clearly demarcated on site using signage and exclusion fencing. • Site workers will be inducted into the CEMP and will be informed of the approved clearance boundaries. • Pre-clearing surveys will be undertaken to demarcate the clearing boundaries. • Supervision by an appropriately qualified ecologist will be undertaken at sensitive construction and demolition sites.	Unlikely	Minor	Very low	Yes
B6	Clearing of a threatened ecological community and/or threatened species habitat leads to a loss of biodiversity in the region.	Medium	• Impacts on TECs and threatened species habitat have largely been avoided through the refinement of the location and design of the new alignments. • The CEMP will include a Site Rehabilitation Plan that details how the Proposal Area will be progressively rehabilitated throughout construction, including through the re-seeding of native grasses. This will include a rehabilitation monitoring program for measuring the effectiveness of the rehabilitation activities. • Tree clearance and modification will occur outside of the breeding season for superb parrot and gang-gang cockatoo (September to January).	Unlikely	Moderate	Low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
B7	Construction activities injure or kill threatened fauna.	Medium	• Fauna spotter catchers will be present during the clearing of native vegetation to ensure that no live animals or nests are harmed as a result of the Proposal. Specific requirements for the fauna spotter catcher will be outlined in the CEMP. • Tree clearance and modification will occur outside of the breeding season for superb parrot and gang-gang cockatoo (September to January).	Unlikely	Moderate	Low	Yes
B8	Clearing of native vegetation results in a loss of connectivity or increased fragmentation in the landscape, and/or obstruction of local movement corridors for threatened fauna.	High	• Impacts on native vegetation have largely been avoided through the refinement of the location and design of the new alignments. This has resulted in the avoidance and minimisation of several key ecological values, including BGW, NTG, PTWL habitat, and mature hollow-bearing trees, which has subsequently reduced impacts relating to habitat connectivity and fauna movements throughout the landscape. • The residual loss of movement trees for superb parrot and gang-gang cockatoo are considered unavoidable.	Likely	Minor	Medium	Yes
B9	Land disturbance during construction results in the spread of invasive species off-site.	Medium	• Drones will be used to carry new conductors between towers for stringing across sensitive ecological areas, including the Murrumbidgee and Molonglo River corridors and no-go zones. • The CEMP will include measures for managing pest animals and weeds in the Proposal Area, including: o Pest animals in the Proposal Area will be managed consistent with the ACT Pest Animal Strategy (ESD, 2012), for example: ▪ Control of rabbits, e.g. through warren destruction or poisoning.	Unlikely	Moderate	Low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			▪ Control of feral pigs, e.g. through trapping and/or 1080 baits (if evidence of feral pigs is identified in the Proposal Area, control measures will be agreed with the relevant landholder). o Protocols will be developed to address site specific risks of spread or infection associated with *Phytophthora cinnamomi* and will be informed by advice from the EPSDD. o Any invasive weeds in the Proposal Area will be managed using chemical and physical methods as appropriate, in accordance with the ACT Weeds Manual (Southern ACT Catchment Group, 2023). • The CEMP will include a detailed ESCP (which builds upon the preliminary ESCP in **Appendix G3**) that documents the controls to be implemented to minimise and manage erosion and sedimentation and to contain sediment-laden runoff. All areas of disturbance will have the following standard erosion and sediment controls (refer to the mitigations provided for S1 for more detail): o Sediment fence to be installed downslope of areas to be disturbed. o Stabilised site access points to be installed as required to reduce the tracking of soil material off-site and to provide a stable surface for vehicle access to the construction site, involving the use of aggregate or recycled concrete along the access track surface and earth bunds to divert stormwater runoff to a sediment trap. o Clean water diversions to be installed as an earth bank upslope of areas to be disturbed.				

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			o Level spreaders to be installed at the end of the clean water diversions to dissipate concentrated flow paths where required. • The CEMP will document the controls to be implemented for stockpile and spoil management, including separation of materials/waste types, sediment controls and stabilisation. • The CEMP will include a Site Rehabilitation Plan that details how the Proposal Area will be progressively rehabilitated throughout construction, including through the re-seeding of native grasses. This will include a rehabilitation monitoring program for measuring the effectiveness of the rehabilitation activities.				
B10	Noise, vibration, lighting, waste, dust and erosion and sedimentation cause impacts on threatened species.	Low	• A Construction Noise and Vibration Management Plan (CNVMP) will be developed for the Proposal as a sub-plan to the CEMP. The CNVMP will contain controls for minimising noise and vibration generated during construction which could impact nearby threatened species, such as (see also the mitigations provided for N1 for more detail): o Low noise equipment and construction methodologies to be selected where possible. o Equipment and vehicles to be turned off when not in use. o Equipment and vehicles to be regularly serviced in accordance with manufacturer requirements. o Acoustic covers on machine engines to remain closed at all times. o Plant to be located and orientated to direct noise away from sensitive habitats where possible. o Noisy machinery to not be operated simultaneously or in a concentrated location where possible (e.g. for earthmoving and ground-impacting operations).	Unlikely	Minor	Very low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			In particular, overlapping construction stages will be undertaken in different locations of the Proposal Area to minimise impacts on sensitive habitats. o Reversing of vehicles and plant to be avoided where possible, to minimise the noise emitted from reverse alarms. • The use of on-site lighting during construction will be limited to times when staff are on site and there is insufficient natural light for maintaining safe working conditions. Lighting during Proposal operation will be limited to times when maintenance work is being undertaken on site. • On-site lighting will be directed towards the Proposal Area and away from sensitive receptors. • The CEMP will include measures for mitigating and managing potential biodiversity impacts caused by dust emissions, such as: o Civil works to be staged to minimise areas of exposed soil, where practicable. o Silt and other materials to be removed from around any sediment and erosion control structures to prevent the deposits from becoming a dust source. o Vehicle speeds to be limited on any unsealed/non-gravelled areas. o Trucks to be covered when carrying dry earth material such as spoil. o Site entrances to be cleaned as needed to prevent the build-up of soil that could become airborne. o Dust generating activities to cease during high winds until dust suppression can be undertaken.				

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			o Dust suppression to be used on exposed soil and/or stockpiles to control any visible dust plumes. Water or similar (e.g. Spraygrass) would be used. Refer to the mitigation measures provided for S1 for further information about spoil management. o The CEMP will include a detailed ESCP that documents the controls to be implemented to minimise and manage erosion and sedimentation and to contain sediment-laden runoff. Refer to the mitigation measures provided for S1 for further information (also partially replicated for B9).				
B11	Cumulative biodiversity impacts occur as a result of the Proposal construction and other developments in the region.	Medium	• Impacts on native vegetation including TECs and threatened species habitat have largely been avoided through the refinement of the location and design of the new alignments. • The CEMP will include a Site Rehabilitation Plan that details how the Proposal Area will be progressively rehabilitated throughout construction, including through the re-seeding of native grasses. This will include a rehabilitation monitoring program for measuring the effectiveness of the rehabilitation activities. • Potential cumulative biodiversity impacts will be further mitigated through the implementation of the CEMP (refer to the mitigations provided for B6–B10 for more detail). • The CEMP will outline a program to monitor the effectiveness of rehabilitation works against the pre-clearance state of the Proposal Area. Any improvement in condition of the site will be measured against baseline conditions, which will be established prior to commencement of rehabilitation works.	Possible	Moderate	Medium	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
B12	Construction of access tracks results in connectivity barriers, and/or obstruction of movement corridors for fauna.	Very Low	• Access tracks coincide with existing farm access tracks wherever possible. New tracks are marked on relevant maps. Limited vegetation clearance would be required, due to siting of these tracks. Tracks would not create any barriers in the environment beyond what is already present.	Unlikely	Minor	Very Low	Yes
B13	Demolition of existing towers results in biodiversity impacts in rural areas and nature reserves	Low	• Within Nature Reserves: o Existing tracks to be utilised to access towers. o Towers to be removed without any vegetation modification. o Towers are to be laid down and dismantled in areas with no ecological value, to be confirmed by on-site ecologist. o Concrete footings to be retained in situ to prevent any ground disturbance. • Within rural and future urban areas: o Existing tracks to be utilised to access towers. o Towers to be removed without any vegetation modification. o Erosion and sediment control to be established around excavation area o Excavation around concrete footings to be minimised o Fill to be replaced back into hole, and clean fill to be utilised for any deficit o Disturbed areas to be reseeded with equivalent grass mix to surrounding vegetation.	Unlikely	Minor	Very Low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
C2	Construction activities result in environmental impacts that are not reported or otherwise acted upon adequately.	Medium	• The CEMP will include measures for managing potential environmental impacts of the Proposal as described in this EIS. On-site workers will be inducted into the CEMP and trained on the appropriate response actions in the event that an unexpected environmental impact occurs. • Construction work will be undertaken in accordance with the CEMP and relevant approvals. • The GJV, or the head construction contractor, will appoint a third party to conduct audits on performance against criteria identified in the CEMP and relevant approvals. Results of these audits will be reported to the EPSDD, DCCEEW and any other agencies as required. Reviews of the CEMP will be undertaken if significant site changes are required, significant legislative changes are made that impact the construction work, the scope of work is changed, or the conditions of the DA approval require CEMP amendments. • The CEMP will identify the corrective actions to be taken in the event of poor performance against the key performance indicators (KPIs). The CEMP and sub-plans (as applicable) will be adaptive documents that are continuously updated to ensure that mitigation and management measures remain fit-for-purpose. • Results of audits will be reported to EPSDD, DCCEEW and other agencies as appropriate.	Remote	Moderate	Very low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
C3	The CEMP, including monitoring and auditing requirements, is not properly implemented, leading to various environmental, social, and economic impacts and non-compliance with approval conditions.	Medium	• The GJV will ensure that its head construction contractor and on-site workers are inducted into the CEMP and trained to implement the CEMP properly. • The GJV, or the head construction contractor, will appoint a third party to conduct audits on performance against criteria identified in the CEMP and relevant approvals. Results of these audits will be reported to the EPSDD, DCCEEW and any other agencies as required. Reviews of the CEMP will be undertaken if significant site changes are required, significant legislative changes are made that impact the construction work, the scope of work is changed, or the conditions of the DA approval require CEMP amendments.	Remote	Moderate	Very low	Yes
CC1	Construction activities result in impacts on air quality (e.g. from vehicle and dust emissions), reducing local amenity and potentially resulting in community complaints and non-compliance with the EP Act.	Low	• Industry best practice CEMP will include measures for mitigating and managing potential air quality impacts caused by dust emissions, such as: o Civil works to be staged to minimise areas of exposed soil, where practicable. o Silt and other materials to be removed from around any sediment and erosion control structures to prevent the deposits from becoming a dust source. o Vehicle speeds to be limited on any unsealed/non-gravelled areas. o Trucks to be covered when carrying dry earth material such as spoil. o Site entrances to be cleaned as needed to prevent the build-up of soil that could become airborne. o Dust generating activities to cease during high winds until dust suppression can be undertaken.	Unlikely	Minimal	Negligible	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			o Dust suppression to be used on exposed soil and/or stockpiles to control any visible dust plumes. Water or similar (e.g. Spraygrass) would be used. Refer to the mitigation measures provided for S1 for further information about spoil management. • The CEMP will include measures for mitigating and managing potential air quality impacts caused by vehicle/ machinery emissions, such as: o Vehicles and machinery to be switched off when not in use to avoid idling and reduce air emissions. o Vehicles and machinery to use fuels as per the requirements of the *Fuel Quality Standards Act 2000* and Fuel Quality Standards Regulations 2019 as accessible, and be fitted with appropriate emission control equipment, maintained frequently, and serviced in accordance with manufacturer specifications. o Only machinery that complies with relevant emissions standards to be used on site. o Heavy vehicles to be serviced off site, unless an unexpected failure occurs while in operation on site. Any emissions filters or catalytic converters are to be tested for integrity. If found to be defective, they are to be replaced prior to equipment use on site. o Locally sourced materials to be used where possible to reduce transport vehicle fuel use and emissions.				
CC2	Cumulative air quality impacts occur as a result of Proposal construction activities and other developments in the region.	Medium	• The CEMP will include measures for mitigating and managing potential air quality impacts caused by vehicle/ machinery emissions and dust emissions (refer to specific mitigations listed for CC1).	Unlikely	Moderate	Low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			• The Proposal's construction schedule will be shared with developers in the vicinity of the Proposal Area who will be undertaking ground disturbing activities at the same time as Proposal construction (e.g. Ginninderry and Neoen for the Territory Battery), to identify staging opportunities to minimise concurrent emissions.				
CC3	Opportunities to minimise greenhouse gas emissions during procurement and construction of the Proposal are not considered, leading to a greater contribution to climate change from the Proposal.	Very low	• The CEMP will include measures for mitigating and managing vehicle / machinery emissions that would contribute to climate change (refer to specific mitigations listed for CC1). • In addition, the GJV / Transgrid will implement the following measures to minimise the Proposal's contribution to climate change: o Construction services and materials to be procured locally where possible, to minimise the distance travelled and therefore emissions of vehicles accessing the site. o Materials used during construction to be selected with a view of reducing the embodied energy of the products. o Energy-efficient work practices to be implemented where possible, such as switching off construction plant, vehicles and equipment when not in use to minimise idling and reduce air emissions. o Vegetation clearance to be limited to the minimum that is required for the Proposal. o Cleared vegetation to be disposed of at a registered compost facility in the Canberra region. Vegetation will not to be sent to landfill or burnt. o Measures for additional emissions mitigation to be identified during site inductions, training and pre-start talks.	Unlikely	Minimal	Negligible	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
H2	Construction activities result in the destruction or damage of Aboriginal cultural heritage items.	Medium	• The Proposal design assessed in this EIS has undergone multiple iterations to avoid impacts on Aboriginal cultural heritage sites. As such, no impacts are anticipated. • Protective barrier fencing consisting of high visibility flagging and star pickets will be installed around known heritage sites located within 20 m of proposed works, with a minimum buffer of 5 m (10 m if possible) to be maintained to prevent any accidental impacts. The fencing will be demarcated onsite and installed by heritage specialists in accordance with advice from RAOs. • An Unexpected Finds Protocol will be included within the CEMP, which details the procedures to be implemented in the event that any previously unidentified Aboriginal heritage items (or objects suspected of having heritage value) are identified during construction. This will build upon the Unexpected Discovery Plan provided at Appendix 2 of the CHA (**Appendix G4**). • Any future design changes will be reassessed in a revised CHA and discussed with the RAOs. This will include reconsideration of whether archaeological test excavations and/or salvage, and preparation of a SHE, are required.	Remote	Major	Low	Yes
H3	Construction activities result in destruction or damage of European heritage places.	Low	• No impacts are anticipated on European heritage places due to the distance between the Proposal and these places. • Protective barrier fencing consisting of high visibility flagging and star pickets will be installed around any NSW/ACT border markers located within 20 m of proposed works, with a minimum buffer of 5 m (10 m if possible) to be maintained to prevent any accidental impacts. The fencing will be demarcated onsite and installed by heritage specialists.	Remote	Moderate	Very low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
HR1	Sparks from construction machinery, vehicles or electrical works start a fire, resulting in fire spreading into the surrounding landscape.	Very high	• All Proposal equipment will be regularly maintained to minimise the possibility of faults or failure and the risk of ignition. • Access tracks will be designed to accommodate fire-fighting appliances in accordance with the Transgrid transmission line access standards and NSW RFS Fire Trail Standards, to ensure fire-fighting appliances can access the Proposal Area in the event of a fire. Design standards to be achieved include: o Access tracks to have a minimum width of 4 m and be at least 6 m-wide where passing bays are located. o Access tracks to be designed and constructed to withstand the 40 t load capacity of Transgrid maintenance vehicles and fire-fighting appliances. o Site access gates to have a minimum opening width of 3.6 m. • Industry best practice CEMP will be implemented that includes a BEMOP that documents the control measures for managing fire-related risks during Proposal, including: o Detailed measures to prevent or mitigate fire ignition, such as: ▪ A suitable fire response tanker trailer, 30 m fire hose and nozzle, and two rake-hoes will be provided at each construction compound. Each tanker will have a minimum water storage capacity of 1,000 L. ▪ All construction vehicles and machinery will be equipped with portable fire extinguishers. If emergency work is required during extreme or catastrophic fire danger weather, the ACT RFS will be contacted to arrange for construction staff to be accompanied if required.	Remote	Catastrophic	Medium	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			o Work that should not be carried out during total fire bans, including the use of heavy earthmoving equipment and hot works such as grinding and welding. o Location and availability of fire suppression equipment, access and water. o Storage locations of fuels and other flammable materials. o Appropriate procedures for construction personnel to follow in the event of a fire. The BEMOP will document the following minimum requirements: ▪ Name and location/address of assets. ▪ Proponent/construction contractor contact details (including phone number). ▪ Number of employees/contractors. ▪ Details about the primary action in the event of a fire (evacuate or take shelter), including the location or address of the primary action. ▪ Details about back-up/pre-emptive procedures, including the location or address. ▪ Assembly point(s) and/or transportation arrangements for an evacuation. ▪ Action statements before, during and after a bushfire. ▪ Site layout of the Proposal, including the location of construction compounds. • Employee list and contact details.				

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
HR2	Unapproved access to site leads to injury or death through contact with electrical equipment.	High	• Construction areas will be securely enclosed during construction to prevent unauthorised access to the site, with a security fence to be installed as early as possible following civil works, and only dismantled in the final stages of construction once equipment has been removed from site. • Vehicular access will only be possible along the dedicated site access roads via dedicated access gates, which will be locked when personnel are not on site (but available for use by host landholders). • Warning signs, security cameras and lighting will be used to further deter unapproved access.	Remote	Catastrophic	Medium	Yes
HR3	Working with high voltage infrastructure places construction workers at risk of injury or death.	Very high	• Only suitably qualified and experienced workers will be employed to work with energised high voltage infrastructure. Workers with be provided the necessary training and safety equipment. • Cables will not be energised until construction has been completed. • Appropriate testing will occur on existing cables prior to disconnection and demolition to confirm that cables are not energised. • Construction personnel will comply with all relevant standards during construction of the Proposal.	Remote	Catastrophic	Medium	Yes
HR4	Construction activities result in unintended damage to existing utilities and other essential infrastructure.	Medium	• All utilities in the vicinity of the Proposal Area will be marked on site plans and communicated to construction personnel during site inductions and toolbox talks. The locations of these utilities will be verified prior to excavation.	Remote	Major	Low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			• The Proponent will engage with Evoenergy and Icon Water during detailed design to deconflict clearance and earthing requirements. • Only Transgrid staff or Transgrid-approved contractors will be permitted to undertake line connection works at existing Transgrid substations and for cut-over of existing Lines 1 and 7 to the new lines. These personnel will be appropriately trained, competent and inducted to work on the electrical infrastructure. • All proposed equipment will be regularly maintained and serviced in accordance with manufacturer requirements to minimise the possibility of failure and associated safety risks, such as the risk of fire ignition. • Construction personnel and contractors will comply with all relevant standards during design, construction, and maintenance to ensure that the Proposal operates efficiently and as intended. • Potential indirect impacts on nearby utility infrastructure or staff arising from vibration, noise and increased traffic from the Proposal, will be managed in accordance with the measures provided for N1, N2, T1 and T2. • The CEMP will include protocols for communicating with utility owners about work being undertaken in proximity to their facilities. Information to be provided will include the nature of the work (e.g. excavation), timing of the planned work (dates and time of day), and contact details of the Proponent and the construction contractor.				

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
L3	Vegetation clearance results in a loss of visual amenity for local residents and impacts on landscape character.	Very low	• Industry best practice CEMP will be implemented which includes measures to mitigate visual impacts associated with vegetation clearance, including the installation of fences or barriers and rehabilitation of construction areas as soon as possible. Approved disturbance areas will be demarcated on site, to ensure that vegetation clearance and vehicle movements do not occur in areas not approved for these activities. • Poles will be used to minimise the need for vegetation clearance in sensitive ecological areas along Stockdill Drive, as they allow for greater separation between conductors and vegetation.	Unlikely	Minor	Very low	Yes
L4	Construction of the Proposal results in a loss of visual amenity for local residents and users of the surrounding area and impacts on landscape character.	Low	• Refer to mitigation measures listed for L3. Additionally, existing roadside vegetation will mitigate the visual impact of the new alignments at some viewpoints, particularly along Stockdill Drive. • Refer to mitigation measures listed for L3 and L4.	Possible	Minor	Low	Yes
L5	Cumulative visual impacts occur as a result of the Proposal and other developments in the region.	Medium	• Refer to mitigation measures listed for L3 and L4.	Possible	Moderate	Medium	Yes
M1	Waste materials produced during construction of the Proposal are not stored or managed such that environmental risks are minimised.	Low	• Industry best practice CEMP will include controls for managing waste during Proposal construction, such as: o Waste will be managed in accordance with the waste management hierarchy shown in **Plate 13.1**, prioritising the reuse of materials where possible.	Unlikely	Minimal	Negligible	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			o Transmission infrastructure being removed will be taken off-site as soon as practicable. If unable to be transported off site immediately, demolition material will be stored at the construction laydown areas until it can be removed from site. o Transmission infrastructure being removed will be reused, recovered or recycled wherever possible, including the steel transmission towers, electrical cabling and concrete foundations. o Spoil will be managed as follows: ▪ Soil excavated from site will be reused as fill where possible to minimise the volume of spoil that needs to be removed from site. Pre-construction soil testing will be done to identify soil that can be reused. ▪ Spoil will be managed in accordance with the ACT's Guideline for Stockpile Management (EPA, 2019) and guidance on spoil management (EPA f, n.d.). In particular, soil and rock will be disposed to landfill if unable to be reused off site. Fill, suspected contaminated material or building wastes will be segregated and stockpiled on site, and tested in accordance with the ACT's requirements for the reuse and disposal of contaminated soil (EPA e, n.d.) prior to reuse or disposal. ▪ The CEMP will include a detailed ESCP (which builds upon the preliminary ESCP in **Appendix G3**) that documents the controls to be implemented for stockpile and spoil management. Refer to S1 (**Table** 6.3, **Section 6.6**) for the detailed list of controls that will be implemented.				

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			o Green waste will be managed as follows: ▪ Green waste will be disposed of at a green waste recycling facility. Green waste skip bins will be used on site if required. ▪ Any invasive weeds in the construction footprint will be managed using chemical and physical methods as appropriate, in accordance with the ACT Weeds Manual (Southern ACT Catchment Group, 2023). ▪ The head construction contractor will provide instructions and training to construction staff on appropriate waste management procedures as detailed in the CEMP. o Packaging waste will be recycled where possible or disposed to landfill. The waste will be separated into waste streams as identified in the CEMP and recycled or disposed of accordingly. Skip bins will be used on site during construction, and regularly emptied. o Separate waste and recycling bins will be provided on site to allow for food waste to be recycled where possible. The need to recycle materials where possible will be included in site inductions and reiterated in toolbox talks. o Human waste will be captured in portable toilets on site during construction and emptied regularly. • The head construction contractor will provide instructions and training to construction staff on appropriate waste management procedures as detailed in the CEMP.				

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				Likelihood	Consequence	Risk Rating	
M2	Excessive amounts of resources used in Proposal construction lead to high volumes of waste to be disposed of.	Very low	• Detailed design will involve the identification of transmission infrastructure specifications that are needed for the new alignments. Only the required amounts of those materials will be ordered, with a small allowance for additional materials (e.g. conductors) as required. This will help to minimise the volume of materials that remain at the completion of construction which need to be managed. • Detailed cut and fill design plans will aim to achieve a balance between cut and fill to minimise the generation of excess volumes of spoil that need to be transported off site for reuse or disposal. • The CEMP will document the approved disturbance area and identify controls for ensuring that the boundary is clearly demarcated on site using signage and exclusion fencing. This will help prevent excess generation of spoil. • Trees and vegetated areas to be removed will also be clearly demarcated on site to avoid accidental clearance of any vegetation and excess generation of green waste. • The CEMP will require waste to be managed in accordance with the ACT waste management hierarchy shown in **Plate** 13.1, thereby minimising the volumes of waste to be disposed of. • Site workers will be inducted into the CEMP and will be informed of the approved clearance boundaries. This will be reiterated during toolbox talks.	Unlikely	Minimal	Negligible	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
N1	Proposal construction activities lead to an increase in noise levels in the surrounding area which reduces local amenity, potentially impacting nearby people and resulting in community complaints and/or non-compliance with the EP Act.	High	• Industry best practice CEMP will be implemented that includes a CNVMP for mitigating and managing noise impacts. It will include controls that are consistent with AS 2436 as well as the following: o Low noise equipment and construction methodologies to be selected where possible. o Equipment and vehicles to be turned off when not in use. o Equipment and vehicles to be regularly serviced in accordance with manufacturer requirements. o Acoustic covers on machine engines to remain closed at all times. o Plant to be located and orientated to direct noise away from the nearest occupied receivers where possible. o Noisy machinery to not be operated simultaneously or in a concentrated location where possible. o Controls for minimising traffic-related noise, such as decreasing vehicle speeds in the vicinity of residential areas, and avoiding compression braking and the use of air brakes near residential areas. o Reversing of vehicles and plant to be avoided where possible. o Hearing protection and training to manage noise impacts to be provided to Proposal construction personnel. • Traffic-related noise impacts will be managed using controls specified in a TMP (see T1), such as: o Heavy vehicle speed limits to be used in the vicinity of residential areas. o Compression braking and the use of air brakes to be avoided near residential areas.	Possible	Moderate	Medium	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			• The CEMP and/or CNVMP will contain protocols for community consultation and complaints handling. Noise affected properties will be notified of the timing, duration and nature of construction works at least seven days prior to works commencing. • The CNVMP will specify management strategies in the event that works are required outside of standard working hours. All on-site workers will be inducted on the CNVMP and be provided with training to manage noise impacts.				
N2	Proposal construction activities lead to off-site vibration which reduces local amenity, potentially impacting nearby people and resulting in damage to nearby structures.	Medium	• The CNVMP will include measures for mitigating and managing vibration impacts such as: o Equipment and vehicles to be turned off when not in use. o Equipment and vehicles to be regularly serviced in accordance with manufacturer requirements. o Vibration-intensive machinery to not be operated simultaneously or in a concentrated location where possible. o Vibration-generating equipment to be sized to avoid the risk of damage to nearby structures. o Once construction equipment has been selected, minimum working distances to be established for vibration-generating equipment not listed in **Table 10.6**. Site-specific vibration minimum working distances to be identified for all equipment once selected. • Additional mitigation measures will be included in the CNVMP depending on the results of geotechnical investigations and need for vibration-inducing equipment, such as the use of smaller or different machinery.	Unlikely	Minor	Very low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			• In the event that any vibration-generating equipment would be used within the recommended safe working distances nominated in **Table 10.6**, or in the event that undocumented heritage structures are discovered during construction, the following will be documented in the CNVMP and implemented: o An independent specific structural assessment of the structure will be undertaken to ascertain the structural integrity and its ability to withstand vibration, and to establish an appropriate vibration minimum working distance and impact criteria. o A dilapidation survey of the structure will be undertaken prior to works commencing, and regular inspections will be conducted throughout the construction activities. o Where appropriate, continuous vibration monitoring will be conducted on the structure for the duration of the period of construction while vibration generating equipment is being used. The vibration logger will be equipped with the ability to remotely alert construction staff to reduce or cease construction activities if vibration levels are approaching the criterion threshold. • The CEMP and/or CNVMP will contain protocols for community consultation and complaints handling. • The CNVMP will specify management strategies in the event that works are required outside of standard working hours. All on-site workers will be inducted on the CNVMP and be provided with training to manage vibration impacts.				

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				Likelihood	Consequence	Risk Rating	
N3	Cumulative noise and vibration impacts occur as a result of Proposal construction and other developments in the region.	High	• The CEMP will include a CNVMP with controls for managing noise and vibration associated with construction of the Proposal (refer to specific mitigations provided for N1 and N2). • The GJV will liaise with the developers of other construction projects in the area with the aim of scheduling noisy and vibration-inducing construction activities of the Proposal to minimise cumulative impacts on receivers.	Unlikely	Moderate	Low	Yes
S1	Construction activities such as vegetation clearance and civil works increase erosion and sedimentation, leading to soil degradation.	High	• Industry best practice CEMP will be implemented that includes a detailed ESCP (which builds upon the preliminary ESCP in **Appendix G3**) that documents the controls to be implemented to minimise and manage erosion and sedimentation and to contain sediment-laden runoff. All areas of disturbance will have the following standard erosion and sediment controls: o Sediment fence to be installed downslope of areas to be disturbed. o Stabilised site access points to be installed as required to reduce the tracking of soil material off-site and to provide a stable surface for vehicle access to the construction site, involving the use of aggregate or recycled concrete along the access track surface and earth bunds to divert stormwater runoff to a sediment trap. o Clean water diversions to be installed as an earth bank upslope of areas to be disturbed. o Level spreaders to be installed at the end of the clean water diversions to dissipate concentrated flow paths where required.	Possible	Minor	Low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			• The CEMP/ESCP will document the controls to be implemented for stockpile and spoil management, including: o Topsoil to be stripped while in a moist condition to maintain the soil structure. o Topsoil to be kept separate from subsoil during stripping and stockpiling. o Topsoil to be preserved on site for reuse in the stabilisation and rehabilitation activities, or for backfilling at demolition sites if possible. o Topsoil to be stockpiled at heights no greater than 2 m to assist in maintaining seed viability, and to minimise compaction of stockpiles to maintain soil structure. o Topsoil to be reapplied within 12 months of stripping where possible, during progressive site rehabilitation. o Spoil to be placed in designated and clearly demarcated stockpile locations within the Proposal Area at locations identified in the CEMP / ESCP. Stockpile locations to avoid high erosion areas, particularly areas of concentrated water flows such as roads, drainage lines and slopes steeper than 10%. o Stockpiles to be protected from wind, rain, concentrated surface water flow and excessive stormwater flows. Sediment fencing to be installed on the downslope side of stockpiles and a clean water diversion bund to be installed on the upslope side. o Stockpiles to be placed outside of sensitive areas including drainage lines and important habitat and where possible, close to stabilised site access points. o Stockpiles to be stabilised (vegetated) if in place for more than 14 days.				

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
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			• As part of site stabilisation and progressive rehabilitation, backfilling of holes created during construction or demolition will occur through preferentially using topsoil and subsoils sourced from construction or demolition activities as part of the Proposal. Where there may be insufficient fill generated from works on site for this purpose, VENM would be imported and used for this purpose. • If spoil is unable to be reused on site, it will be transported off site for reuse at other construction sites if possible, or for disposal. The CEMP will detail the requirements for transport and disposal of materials. • The CEMP will also include general best practice measures for minimising managing movement of soil throughout the Proposal Area and surrounds, including: o Onsite demarcation of approved disturbance areas to ensure that construction activities, facilities, infrastructure and materials are constrained to these areas to avoid unapproved impacts on adjacent areas. Disturbance areas will be set back from drainage lines, waterbodies and sensitive habitats. o Construction vehicles to only use approved disturbance areas, including demarcated access tracks. o Disturbance areas to be stabilised and rehabilitated as soon as practicable. • The CEMP/ESCP will detail the monitoring and maintenance requirements for the erosion and sediment controls during Proposal construction. This will include: o Visual inspections of all erosion and sediment controls each day during construction, prior to forecasted rainfall events greater with more than 10 mm in 24 hours, and after rainfall events with more than 10 mm in 24 hours.				

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			o Visual inspections of drainage lines and waterbodies immediately downslope of disturbance areas, and of outflows from clean water diversions each week during construction, after rainfall events with more than 10 mm in 24 hours, and as required, to identify and fix any deficient erosion and sediment controls. Water quality will be inspected, including signs of turbidity and hydrocarbon slicks/spills. • All inspections to be documented on the CEMP environmental inspection checklist and any actions to be closed out withing a reasonable and practical timeframe.				
S2	Fuel or chemical spills, or disturbance of existing contaminated material, lead to soil contamination which could result in environmental degradation and fines under the EP Act.	Low	• Intrusive soil investigations will be undertaken as part of the DA process in Blocks 1614, 1602 and 1461 Belconnen to confirm whether any contamination is present in the Proposal Area. Any contaminated material identified during the intrusive investigations will be avoided if possible through Proposal re-design, or managed in accordance with controls specified in the CEMP. • The CEMP will contain an Unexpected Finds Protocol in the event that contaminated soils or other materials are exposed during the intrusive investigations or Proposal construction activities which are confirmed or suspected of contamination. The following protocol will be implemented: o All earthworks will cease in the immediate vicinity of the contaminated material (or the material suspected of contamination). o Measures will be implemented to prevent run-on to the contaminated area and to contain runoff from the contaminated material (e.g. construction of an earth bund around the area).	Remote	Minor	Negligible	Yes

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			o The contaminated material and any rainfall runoff captured within the contained area will be classified in accordance with Environmental Standards: Assessment and Classification of Liquid and Non-Liquid Wastes (EPSDD, 2021). o If the material (and any captured rainfall runoff) are confirmed as contaminated, earthworks in the vicinity of the contamination (nominally within a 100 m radius) will cease and a contaminated lands specialist will be engaged to develop a plan to: ▪ Manage and dispose of the contaminated material. ▪ Assess the risk of encountering additional areas of contamination. ▪ Identify any requirement for additional soil sampling to detect any additional areas of contamination. ▪ If the classification process indicates soils are not contaminated, earthworks may proceed. • The CEMP will also document procedures for the transport, storage and management of fuels and any chemicals to be used during Proposal construction, including measures to manage accidental chemical spills or leaks (e.g. through the supply and maintenance of spill kits). It will include a procedure for remediation if any contamination occurs as a result of the Proposal.				
T1	Increased volumes of construction and demolition traffic on local roads, construction of Proposal access tracks, and stringing/destringing of conductors over public roads result in traffic disruptions to	Low	• Construction and demolition will be restricted to: o Monday to Friday: 7 am to 6 pm o Saturday: 7 am to 1 pm. • Heavy vehicles accessing the Proposal Area will be spaced evenly throughout the day where possible. • Any road closures to changed traffic conditions to be minimised, and timed to not interact with busy periods.	Unlikely	Minor	Very low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
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	residents and other road users, or damage to road surfaces.		• The CEMP will include a TMP with traffic management controls such as: o Local residents and businesses to be notified of potential traffic disruptions, with details such as the expected dates and timing of the disruption and the nature of the disruption to be provided. o Approved heavy vehicle access route to be documented and communicated to transport companies prior to delivery of equipment and materials. o The site access roads, access tracks and parking for construction workers are to be documented and demarcated on site, and included in site inductions and toolbox talks. • Any damage to road surfaces resulting from construction/demolition traffic would be rehabilitated appropriately.				
T2	Temporary traffic management measures implemented during construction are not suitable and result in near miss incidents, crashes, injuries or death.	High	• The CEMP will include a TMP with traffic management controls such as: o Signage to be placed along major roads to warn drivers of construction work and vehicles entering and exiting the Proposal Area. • The TMP will be implemented by qualified personnel from either the construction company or a separate temporary traffic management company. • The TMP will be adaptive and able to be updated in response to the identification of any inadequate traffic management controls. • The TMP will include procedures for monitoring the effectiveness of controls in an effort to identify any inadequate controls prior to any incidents occurring.	Remote	Catastrophic	Medium	Yes

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				Likelihood	Consequence	Risk Rating	
			• The CEMP will include a complaints handling procedure for ensuring that any feedback from the community, such as any relating to traffic management, can be communicated to the GJV for integration in the CEMP and sub-plans.				
T3	Uncontrolled access by construction vehicles leads to dispersal of litter or other pollutants, damage to habitats or areas to be retained, and spread of weeds within the Proposal Area and/or areas outside the Proposal Area.	Medium	• The CEMP will include controls such as: o No-go zones, site boundaries and fences to be established to prevent unauthorised access into areas adjacent to the Proposal Area. o The site access roads, access tracks and parking for construction workers are to be documented and demarcated on site. o All contractors to be informed of the Proposal Area boundary and relevant approval conditions prior to commencing construction during site inductions, and reminded during toolbox talks. o Pest and weed management and the inclusion of appropriate waste disposal. Refer to the mitigation measures for B9 for further detail.	Unlikely	Minor	Very low	Yes
T4	Construction of access tracks results in unanticipated vegetation clearance.	Medium	• Existing access tracks will be used for demolition activities. No additional clearing permitted. • Existing access tracks will be used for construction where marked on maps, with widening and formalisation only to occur where required for heavy vehicle access. • Construction of access tracks will be subject to erosion and sediment control, weed management, and rehabilitation where appropriate. • Additional consultation will be undertaken with rural landholders and land managers prior to construction and demolition activities to confirm access track locations, and document any requirements for their use, timing restrictions or rehabilitation.	Unlikely	Moderate	Low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
T5	Cumulative traffic congestion impacts occur as a result of the Proposal and other developments in the region	Low	• The CEMP will include a TMP with controls for managing traffic associated with construction and demolition works that are part of the Proposal (see mitigations provided for T1). • The head construction contractor will liaise with Ginninderry and any other nearby developments and businesses to minimise potential cumulative traffic disruption impacts on local road users where practicable.	Possible	Minor	Low	Yes
W1	Earthwork activities generate soil that increases sedimentation of nearby waterways when transported off site.	High	• Industry best practice CEMP will be implemented that includes a detailed ESCP (which builds upon the preliminary ESCP in **Appendix G3**) that documents the controls to be implemented to minimise and manage erosion and sedimentation and to contain sediment-laden runoff. Refer to S1 for detail about the standard erosion and sediment controls to be implemented • The ESCP will also detail any site-specific erosion and sediment controls that may be required, such as: o Temporary waterway crossings may be installed for site access tracks to avoid vehicles needing to cross steep or swampy watercourses. This would involve the use of aggregate to provide a stable surface and water diverting structures such as swales to divert runoff away from the crossing. o Any single disturbance area that is larger than 1 ha will require a sediment basin as per Chapter 5 of the Environment Protection Guidelines for Construction and Land Development in the ACT (EPA, 2022a). The design details for any sediment basins will be included in the ESCP.	Unlikely	Moderate	Low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			• The CEMP/ESCP will document the controls to be implemented for stockpile and spoil management, transport and disposal. Refer to S1 for detail about these controls. • The CEMP/ESCP will detail the monitoring and maintenance requirements for the erosion and sediment controls during Proposal construction. Refer to S1 for detail about the monitoring requirements.				
W2	Fuel or chemical spills, or disturbance of existing contaminated material, lead to contamination of groundwater and/or nearby waterways, which could result in environmental degradation and fines under the EP Act.	Low	• Intrusive soil investigations will be undertaken as part of the DA process in Blocks 1614, 1602 and 1461 Belconnen to confirm whether any contamination is present in the Proposal Area. Any contaminated material identified during the intrusive investigations will be avoided if possible through Proposal re-design, or managed in accordance with controls specified in the CEMP. • The CEMP will contain an Unexpected Finds Protocol in the event that contaminated soils or other materials are exposed during the intrusive investigations or Proposal construction activities which are confirmed or suspected of contamination. Refer to S2 for detail about this unexpected find protocol. • The CEMP will also document procedures for the transport, storage and management of fuels and any chemicals to be used during Proposal construction, including measures to manage accidental chemical spills or leaks (e.g. through the supply and maintenance of spill kits). It will include a procedure for remediation if any contamination occurs as a result of the Proposal.	Remote	Moderate	Very low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
W3	Any groundwater dewatering required is discharged directly or indirectly to surface waterbodies, impacting the water quality of the receiving waters.	Low	• Geotechnical investigations will be undertaken at each new tower location once detailed design is complete, which will confirm whether groundwater is likely to be intersected during excavation and require dewatering. • A Dewatering Plan will be prepared as part of the CEMP if dewatering is required, to ensure extracted water is disposed of appropriately to avoid impacting surface water quality and sensitive habitats. o The excavated water would be tested prior upon extracted and only discharged to ground if of suitable quality (subject to regulatory approvals and licences). o The water would be discharged downslope of the tower to prevent runoff into the excavation, away from steep slopes and drainage lines where concentrated flows could lead to erosion and sedimentation and away from sensitive habitats.	Remote	Minor	Negligible	Yes
W4	Any groundwater dewatering required results in localised changes to groundwater levels.	Very low	• Geotechnical investigations will be undertaken at each new tower location once detailed design is complete, which will confirm whether groundwater is likely to be intersected during excavation and require dewatering. • A Dewatering Plan will be prepared as part of the CEMP if dewatering is required, to ensure only the require amount of groundwater is extracted to minimise changes to groundwater levels. Refer to W3 for more information on the Dewatering Plan.	Unlikely	Minimal	Negligible	Yes
W5	Water generated during fire suppressing activities resulting from construction activities, results in run-off, and potential environmental degradation.	Medium	• Refer mitigation measures for W1 and HR1.	Unlikely	Moderate	Low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
SE4	People in areas near the Proposal are exposed to increased levels of noise, vibration, dust emissions, lighting and traffic from construction activities, reducing local amenity and potentially resulting in community complaints, non-compliance with the EP Act and/or safety issues.	Very high	• Industry best practice CEMP will be implemented that includes a range of sub-plans for mitigating and managing local amenity and traffic impacts. Refer to the mitigation measures provided for the following risks for information: o Noise and vibration: N1, N2 and N3. o Dust emissions: CC1 and CC2. o Lighting and visual amenity: L3, L4 and L5. o Traffic disruption and safety: T1, T2 and T5.	Unlikely	Catastrophic	High	Yes
Operation							
B14	Proposal Area becomes infested with weeds, leading to an increased risk to off-site areas.	Medium	• The Site Rehabilitation Plan will outline a program to monitor the effectiveness of rehabilitation works against the pre-clearance state of the Proposal Area. Any improvement in condition of the site will be measured against baseline conditions, which will be established prior to commencement of rehabilitation works. • The Site Rehabilitation Plan will be adaptive, so that any decline in condition which can be clearly attributed to the Proposal, and appropriate reparation actions, are able to be identified and implemented. The Site Rehabilitation Plan will outline triggers for reparation. • *Phytophthora cinnamomi* is not known to occur within the Proposal Area. Nevertheless, protocols will be implemented to reduce the potential risk of *Phytophthora cinnamomi* spreading into the Proposal Area or broader landscape, consistent with advice from the EPSDD.	Unlikely	Minor	Very low	Yes
B15	Non-compliance with the Offset	High	• N/A The Project will not require Offsets.	Remote	Minimal	Negligible	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
	Management Plan (if required) and/or approval conditions, inadequate management of offset site, or failure of offset site leads to Proposal financial and reputational issues, and environmental losses.						
B16	Operation of the transmission lines results in line collision by birds, particularly over river crossings	Low	• Flagging over river corridors may be considered retrospectively if bird fatality is observed, however no evidence currently to suggest this mitigation measure is required. • Monitoring program to be implemented to inform any additional measures.	Possible	Minor	Low	Yes
B17	Operational maintenance of new towers results in impacts to avoided areas of environmental sensitivity.	Medium	• Mapping of sensitive sites (in particular location of NTG) is to be provided to Transgrid to ensure ongoing avoidance by maintenance personnel	Unlikely	Moderate	Low	Yes
C4	The Proposal is non-compliant with approval management conditions.	Medium	• A Superintendent/Contract Manager will be engaged to supervise the works and ensure approval management conditions are met. • On-site workers will be inducted to site and trained to implement the management actions and approval management conditions properly. • The Proposal will be operated and maintained in accordance with relevant approvals and Transgrid requirements. • The GJV or Transgrid will appoint a third party to conduct audits on performance against relevant approvals and Transgrid requirements. Results of these audits will be reported to the EPSDD, DCCEEW and any other agencies as	Unlikely	Moderate	Low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			required.				
H4	Once operational, the Proposal results in adverse impacts on the heritage values of European heritage places.	Very low	• No impacts are anticipated on European heritage places due to the distance between the Proposal and these places. • Refer to H1 for measures that will be implemented during the Proposal's design stage to avoid adverse impacts on the heritage values of European heritage places in the event that any major design changes are made to the Proposal (e.g. re-routing of the new alignments).	Remote	Moderate	Very low	Yes
HR5	Sparks from maintenance machinery, vehicles or electrical works start a fire, resulting in fire spreading into the surrounding landscape.	Very high	• Refer to mitigation and management measures listed for HR1. • Transmission line easements will be regularly inspected during the fire danger period, and the grassland vegetation managed to maintain a maximum height of 200 mm when the grassland vegetation reaches 70% cured. • All Proposal equipment will be regularly maintained and serviced in accordance with manufacturer requirements to minimise the possibility of failure and associated safety risks, such as the risk of fire ignition. The GJV and Transgrid (including contractors) will comply with all relevant standards during maintenance to ensure that the Proposal operates efficiently and as intended.	Remote	Catastrophic	Medium	Yes
HR6	Unapproved access to site leads to injury or death through contact with electrical equipment.	Medium	• Hazardous electrical equipment will not be accessible to the general public. Ladders on the towers/poles will be locked to prevent unapproved persons from climbing the structures and making contact with energised conductors. The substations will be enclosed in high security fencing with warning signs, security cameras and lighting to be used to further deter unapproved access.	Remote	Catastrophic	Medium	Yes
HR7	Maintenance of Proposal	Low	• All Proposal equipment will be regularly serviced in	Remote	Moderate	Very low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
	components is not undertaken appropriately or effectively over the life of the Proposal, resulting in increased bushfire risk to the surrounding landscape and/or the system not operating as designed.		accordance with manufacturer requirements to minimise the possibility of failure and associated safety risks. • The Proposal will be designed, constructed and maintained in accordance with all relevant Australian and Transgrid standards, which will help ensure that it is operating efficiently and as intended. • The transmission lines and associated easements will be managed in accordance with the Transgrid Line Clearance Management Plan July 2021–June 2026, or as revised.				
HR8	Impacts on human health and safety from exposure to electromagnetic fields (EMF) and frequencies associated with high voltage powerlines.	Medium	• The new alignments have been designed to minimise potential EMF impacts of the Proposal where practicable, in accordance with the following hierarchy: o Structures other than those associated with the Transgrid transmission lines will not be within a 17 m ground exclusion zone either side of each transmission line's centre line. o The new alignments were sited to avoid residences and commercial or industrial buildings such as the LMWQCC, thereby minimising the risk of public exposure. o Tower heights have been selected to ensure the powerlines would have appropriate clearance above the ground and that EMF exposure levels would be below the relevant reference levels. o All fences passing within the easements of the new alignments will have isolation panels installed and be earthed as per Transgrid fencing guidelines (Transgrid, 2016). o All metallic infrastructure that crosses or runs parallel to an easement of the new alignments will be tested to ensure that the required earthing and isolation is in	Remote	Moderate	Very low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			place. • Commissioning of the new alignments will involve testing (low voltage current injection testing) to verify that the transmission lines have been adequately earthed and whether there are any hazards (e.g. metallic structures) that need to be mitigated which weren't identified during the Proposal's design stage. Contractors will have this requirement written into their scope of work beyond standard approaches to achieve best practice, as is done for other Transgrid construction projects such as the Stockdill Substation.				
HR9	Aircraft operating in the vicinity of the Proposal collide with the new transmission lines.	High	• The GJV will contact the EPSDD prior to construction commencing, to clarify how the National Airports Safeguarding Framework is applied in the ACT and what the requirements are for transmission lines. • It is anticipated that the GJV or Transgrid will need to notify airport operators (e.g. for Canberra Airport, Wallaroo Airstrip, Hall Airport, Wee Jasper Airport and Gundaroo Airport) and relevant authorities (e.g. Airservices Australia, ACT RFS and ACT F&R) of the changes to the transmission line locations, so that they can update their records and ensure the new infrastructure is avoided during flights.	Remote	Catastrophic	Medium	Yes
L6	Once operational, the Proposal results in a loss of visual amenity for local residents and users of the surrounding area and impacts on landscape character.	High	• The location of the new alignments was selected through an iterative design process over several years to ensure the Proposal infrastructure would not be inconsistent with or overly prominent in the landscape. Impacted landholders were consulted throughout the design process, and designs with too severe of a visual impact were rejected. stakeholders found that the final Proposal design (assessed in this EIS) was acceptable for further consideration, demonstrating the	Likely	Moderate	High	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			effectiveness of the GJV's avoidance efforts. • Additionally, the Proposal involves the relocation of Lines 1 and 7 (i.e. replacement of existing infrastructure with new infrastructure), which will avoid the accumulation of transmission lines in the landscape. • No additional mitigation such as vegetation screening is proposed, as this would have adverse impacts on views of the surrounding rural and riverine landscapes which are considered to outweigh benefits from screening views of the new alignments.				
L7	Cumulative visual impacts occur as a result of operation of the Proposal and other developments in the region.	Medium	• Refer to avoidance measures described for L6. • As a considerable portion of the Proposal Area contains existing utility infrastructure (e.g. the Stockdill and Canberra Substations, other high voltage transmission lines and smaller powerlines, the LMWQCC, and the proposed Territory Battery), the Proposal would not result in the addition of new elements into the landscape, thereby minimising potential cumulative impacts. • Further, the removal of existing lines as part of the Proposal will improve local amenity by reducing visual impacts on residential areas.	Possible	Moderate	Medium	Yes
N4	Once operational, noise from the Proposal (caused by corona discharge) reduces local amenity, potentially impacting nearby people and resulting in community complaints and/or non-compliance with the EP Act.	Low	• Detailed design at DA Stage will include consideration of measures for mitigating corona effects, including the use of line fittings (such as hardware corona rings) and conductor arrangements (i.e. increasing the conductor size, increasing the distance between conductors and/or using bundled conductors). • If corona discharge noise is identified as an issue via community complaints, noise monitoring will be undertaken to determine noise levels. As per standard practice, at-	Possible	Minor	Very Low	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
			property treatments, if triggered, would need to be determined in consultation with the landholder and informed by a detailed building condition survey and final confirmed noise levels. Noise monitoring during corona discharge conditions and building condition surveys would determine if acoustic treatment is required and the level of treatment required. • Complaints handling process will be communicated to sensitive receivers within the Proposal Area.				
N5	Cumulative noise impacts occur as a result of operation of the Proposal and other developments in the region.	Low	• Refer to the measures listed for N4 for mitigating operational noise impacts of the Proposal.	Unlikely	Minor	Very Low	Yes
T6	Increased volumes of maintenance traffic on local roads result in traffic disruptions to residents and other road users.	Negligible	• The TMP will include controls for management traffic associated with operation (maintenance) of the Proposal (see mitigations provided for T1).	Unlikely	Minimal	Negligible	Yes
SE5	Residents or landholders near the new alignments raise unanticipated or additional concerns to those raised during targeted in the development process, resulting in community complaints, public animosity and/or reputational risks.	Medium	• Refer to the mitigation measures provided for SE1.	Unlikely	Moderate	Low	Yes
SE6	People in areas near the Proposal are exposed to increased levels of noise and	High	• Refer to the mitigation measures provided for the following risks for information on how amenity impacts will be managed during Proposal operation:	Likely	Moderate	High	Yes

ID	Risk Scenario	Preliminary Risk Rating	Mitigation and Management Measures	Residual Risk Assessment			Is the Risk ALARP?
				Likelihood	Consequence	Risk Rating	
	reduced visual amenity once the Proposal is operational, reducing local amenity and potentially resulting in community complaints and non-compliance with the EP Act.		o Noise: N4 and N5. o Visual amenity: L6 and L7.				

19.0 Environmental Management Framework

Chapter Summary
This chapter provides a summary of the key commitments and mechanisms to be implemented during construction and operation of the Proposal to manage the environmental risks identified in this EIS.

19.1 Summary of Draft Environmental Management Commitments

The measures that will be implemented to mitigate and manage potential impacts associated with the Proposal are summarised in **Table 19.1**. These measures have been derived from the investigations undertaken for this EIS and are based on industry best practice. The full list of mitigation measures provided in **Table 18.1** (**Chapter 18.0**) are expected to form the basis of any conditions of consent for the Proposal and will be upheld by the GJV and Transgrid and their contractors.

Table 19.1 Summary of the Proposal's Environmental Management Commitments

Item	Mitigation and Management Measures
1	**Construction Impacts** A Construction Environment Management Plan (CEMP) will be prepared by the head construction contractor prior to construction commencing. The CEMP will establish the site management principles and construction procedures in accordance with industry best practice, and include a range of sub-plans as detailed below. An outline of the CEMP is provided in **Section 19.3**.
2	**Biodiversity** • The CEMP will include details about the following mitigation measures to be implemented during Proposal construction: o Demarcation of approved clearance boundaries (construction footprint): The approved disturbance area will be documented in the CEMP. Pre-clearing surveys will be undertaken to demarcate the clearance boundaries using signage and exclusion fencing. Site workers will be inducted into the CEMP and informed of the approved clearance boundaries. o Construction supervision by an appropriately qualified ecologist during construction in environmentally sensitive locations. o Fencing and access control: ▪ Signage and exclusion fencing will be used during construction to identify areas approved for clearance and areas not to be cleared, and to prevent vehicle access into no-go areas. ▪ Where possible, fencing will not include barbed wire on the top line of the fence. o Pest plant and animal management: ▪ Fauna spotter catchers will be present during the clearing of native vegetation, particularly any hollow-bearing trees, to ensure that no live animals or nests are harmed during construction. Tree clearance and lopping will occur outside of the breeding season for superb parrot and gang-gang cockatoo (September to January). ▪ Invasive weeds in the Proposal Area will be managed annually using chemical and/or physical methods in accordance with the ACT Weeds Manual (Southern ACT Catchment Group, 2023). ▪ Pest animals in the Proposal Area will be managed in accordance with the ACT Pest Animal Strategy (ACT Government, 2010), for example: • Control of rabbits, e.g. through warren destruction or poisoning. • Control of feral pigs, e.g. through trapping and/or 1080 baits (if evidence of feral pigs is identified in the Proposal Area, control measures will be discussed with the relevant landholder). ▪ Drones will be used to carry new conductors between towers for stringing across sensitive ecological areas, including the Murrumbidgee and Molonglo River corridors and no-go areas.

Item	Mitigation and Management Measures
	o *Phytophthora cinnamomi* management: *Phytophthora cinnamomi* is not known to occur within the Proposal Area. Nevertheless, protocols will be implemented to reduce the potential risk of *Phytophthora cinnamomi* spreading into the Proposal Area or broader landscape, consistent with advice from the EPSDD. • The CEMP will include a Site Rehabilitation Plan that details how the Proposal Area will be progressively rehabilitated throughout construction, including through re-seeding of native grasses. This will include a rehabilitation monitoring program for measuring the effectiveness of the rehabilitation activities. • A package of compensatory measures will be prepared prior to Proposal construction commencing, specifying locations for native replanting and research commitments. Success of plantings will be included in the rehabilitation monitoring program. Any works within or adjacent to Nature Reserves will including monitoring and weed management for 24 months.
3	**Soil** • The CEMP will include an Erosion and Sediment Control Plan (ESCP) which builds upon the preliminary ESCP provided in **Appendix G3**, to minimise and manage erosion and sedimentation and to contain sediment-laden runoff during construction. The CEMP or ESCP will detail the monitoring and maintenance requirements for the erosion and sediment controls. • Each type of construction activity (e.g. new tower construction, demolition of existing tower, laydown area construction, access track construction) will have the following standard erosion and sediment controls: o Sediment fence to be installed downslope of areas to be disturbed. o Stabilised site access points to be installed as required to reduce the tracking of soil material off-site and to provide a stable surface for vehicle access to the construction site, involving the use of aggregate or recycled concrete along the access track surface and earth bunds to divert stormwater runoff to a sediment trap. o Clean water diversions to be installed as an earth bank upslope of areas to be disturbed. o Level spreaders to be installed at the end of the clean water diversions to dissipate concentrated flow paths where required. • The CEMP or ESCP will document the stockpile and spoil management controls to be implemented during construction, including: o Topsoil to be stripped while in a moist condition to maintain the soil structure. o Topsoil to be kept separate from subsoil during stripping and stockpiling. o Topsoil to be preserved on site for reuse in the stabilisation and rehabilitation activities, or for backfilling at demolition sites if possible. o Topsoil to be stockpiled at heights no greater than 2 m to assist in maintaining seed viability, and to minimise compaction of stockpiles to maintain soil structure. o Topsoil to be reapplied within 12 months of stripping where possible, during progressive site rehabilitation. o Spoil to be placed in designated and clearly demarcated stockpile locations within the Proposal Area at locations identified in the CEMP or ESCP. Stockpile locations are to avoid high erosion areas, particularly areas of concentrated water flows such as roads, drainage lines and slopes steeper than 10%.

Item	Mitigation and Management Measures
	o Stockpiles to be protected from wind, rain, concentrated surface water flow and excessive stormwater flows. Sediment fencing to be installed on the downslope side of stockpiles and a clean water diversion bund to be installed on the upslope side. o Stockpiles to be placed outside of sensitive areas including drainage lines and important habitat and where possible, close to stabilised site access points. o Stockpiles to be stabilised (vegetated) if in place for more than 14 days. • As part of site stabilisation and progressive rehabilitation, backfilling of holes created during construction or demolition will occur through preferentially using topsoil and subsoils sourced from construction or demolition activities as part of the Proposal. Where there may be insufficient fill generated from works on site for this purpose, VENM would be imported and used for this purpose. • Spoil unable to be reused onsite or at another construction site will be disposed of. The CEMP will detail the requirements for transport and disposal of materials. • The CEMP or ESCP will detail the monitoring and maintenance requirements for the erosion and sediment controls during Proposal construction, including: o Visual inspections of all erosion and sediment controls each day during construction, prior to forecasted rainfall events with more than 10 mm in 24 hours, and after rainfall events with more than 10 mm in 24 hours. o Visual inspections of drainage lines and waterbodies immediately downslope of disturbance areas, and of outflows from clean water diversions each week during construction, after rainfall events with more than 10 mm in 24 hours, and as required, to identify and fix any deficient erosion and sediment controls. Water quality will be inspected, including signs of turbidity and hydrocarbon slicks/spills. o All inspections will be documented on the CEMP environmental inspection checklist and any actions will be closed out withing a reasonable and practical timeframe.
4	**Contamination** • Due to the potential fill and PFAS contamination identified near the Lower Molonglo Water Quality Control Centre (LMWQCC), intrusive soil investigations will be undertaken as part of the DA process in Blocks 1614, 1602 and 1461 Belconnen, to confirm whether any contamination is present in the Proposal's disturbance area. If contamination is confirmed, the Proposal design will be modified to avoid the contamination if practicable, or the contaminated material will be managed in accordance with controls specified in the CEMP to prevent any further soil degradation or contamination of nearby waterbodies. • The CEMP will include an Unexpected Finds Protocol in the event that contaminated soils or other materials are exposed during earthworks which are suspected of contamination. The following protocol will be implemented: 1. All earthworks will cease in the immediate vicinity of the material suspected of contamination. 2. Measures will be implemented to prevent run-on to the area with suspected contamination, and to contain runoff from the suspected contamination (e.g., construction of an earth bund around the area). 3. The material suspected of contamination and any rainfall runoff captured within the contained area will be classified in accordance with Environmental Standards: Assessment and Classification of Liquid and Non-Liquid Wastes (EPSDD, 2021a).

Item	Mitigation and Management Measures
	4. If the material (and any captured rainfall runoff) is confirmed as contaminated, earthworks in the vicinity of the contamination (nominally within a 100 m radius) will cease and a contaminated lands specialist will be engaged to develop a plan to: a. Manage and dispose of the contaminated material. b. Assess the risk of encountering additional areas of contamination. c. Identify any requirement for additional soil sampling to detect any additional areas of contamination. 5. If the classification process indicates soils are not contaminated, earthworks may proceed. • The CEMP will document procedures for the transport, storage and management of fuels and any chemicals to be used during Proposal construction, including measures to manage accidental chemical spills or leaks (e.g. through the supply and maintenance of spill kits). It will also include a procedure for remediation if any contamination occurs as a result of the Proposal.
5	**Surface water and groundwater** • Controls measures for erosion, sedimentation and contamination, which could have impacts on surface water and groundwater, will be detailed in the CEMP and ESCP as relevant (see Items 3 and 4 above for further information). • Geotechnical investigations will be undertaken at each new tower location once detailed design is complete, which will confirm whether groundwater is likely to be intersected during excavation and require dewatering. A Dewatering Plan will be prepared as part of the CEMP if dewatering is required, to ensure extracted water is disposed of appropriately to avoid impacting surface water quality and sensitive habitats.
6	**Aboriginal and European heritage** • Known Aboriginal cultural heritage sites located within 20 m of proposed construction works will be protected by barrier fencing consisting of high visibility flagging and star pickets, with a minimum buffer of 5 m (10 m if possible) to prevent any accidental impacts. The fencing will be demarcated onsite and installed by heritage specialists, with Representative Aboriginal Organisations (RAOs) invited to provide advice in relation to the protection of Aboriginal heritage sites. • An Unexpected Finds Protocol will be included within the CEMP, which details the procedures to be implemented in the event that any previously unidentified Aboriginal heritage (or objects suspected of having heritage value) are identified during construction. This will build upon the Unexpected Discovery Plan provided at Appendix 2 of the CHA (**Appendix G4**). • The location of the NSW/ACT border markers will be marked on final Proposal plans and within the CEMP as areas to be avoided.
7	**Landscape and visual** • The CEMP will include measures to mitigate visual impacts associated with vegetation clearance, including the installation of fences or barriers and rehabilitation. Approved disturbance areas will be demarcated on site to ensure that vegetation clearance and vehicle movements do not occur in areas not approved for these activities.

Item	Mitigation and Management Measures
8	**Noise and vibration** • The CEMP will include a Construction Noise and Vibration Management Plan (CNVMP) for mitigating and managing noise and vibration impacts during Proposal construction. The control measures will be consistent with *AS 2436 Guide to noise control on construction, maintenance and demolition sites*, as in force during Proposal construction, to ensure that noise exemptions in the Environment Protection Regulation 2005 can be applied. Species controls that will be implemented include: o Low noise equipment and construction methodologies will be selected where possible. o Equipment and vehicles will be turned off when not in use. o Equipment and vehicles will be regularly serviced in accordance with manufacturer requirements. o Acoustic covers on machine engines will remain closed at all times. o Plant will be located and orientated to direct noise away from the nearest occupied receivers where possible. o Noisy machinery will not be operated simultaneously or in a concentrated location where possible (e.g. for earthmoving and ground-impacting operations). In particular, overlapping construction stages will be undertaken in different locations of the Proposal Area to minimise impacts on receivers where possible. o Controls for minimising traffic-related noise will be implemented, such as decreasing vehicle speeds in the vicinity of residential areas, and avoiding compression braking and the use of air brakes near residential areas. o Reversing of vehicles and plant will be avoided where possible, to minimise the noise emitted from reverse alarms. o Hearing protection and training for managing noise impacts will be provided to construction personnel associated with the Proposal. o Vibration-generating equipment (e.g. vibratory rollers) will be sized to avoid the risk of damage to nearby structures. o Protocols for community consultation and complaints handling will be documented, including noise affected properties to be notified of the timing, duration and nature of construction works at least seven days prior to works commencing. o Management strategies will be documented in the event that works are required outside of standard working hours. • The CEMP will include a Traffic Management Plan (TMP) for mitigating and managing traffic-related noise impacts, including controls such as heavy vehicle speed limits in the vicinity of residential areas and avoiding compression braking and the use of air brakes near residential areas. See Item 9 below for further information. • The actual construction equipment to be used on site will be confirmed by the construction contractor during detailed design. For any vibration-generating equipment not listed in **Table 10.5**, minimum working distances will be established. • In the event that any vibration-generating equipment would be used within the recommended safe working distances nominated in **Table 10.5**, or in the event that undocumented heritage structures are discovered during construction, the following will be documented in the CNVMP and implemented: o An independent specific structural assessment of the structure will be undertaken to ascertain the structural integrity and its ability to withstand vibration, and to establish an appropriate vibration minimum working distance and impact criteria.

Item	Mitigation and Management Measures
	o A dilapidation survey of the structure will be undertaken prior to works commencing, and regular inspections will be conducted throughout the construction activities. o Site-specific vibration minimum working distances will be identified for the equipment once selected. o Where appropriate, continuous vibration monitoring will be conducted on the structure for the duration of the period of construction while vibration generating equipment is being used. The vibration logger will be equipped with the ability to remotely alert construction staff to reduce or cease construction activities if vibration levels are approaching the criterion threshold. • The GJV will liaise with the developers of other construction projects in the area with the aim of scheduling noisy and vibration-inducing construction activities to minimise cumulative impacts. • Measures for mitigating corona effect have been included in the design. Once the Proposal is operational, if corona discharge noise is identified as an issue via community complaints, noise monitoring will be undertaken to determine noise levels. As per standard practice, at-property treatments, if triggered, would need to be determined in consultation with the landholder and informed by a detailed building condition survey and final confirmed noise levels. Noise monitoring during corona discharge conditions and building condition surveys would determine if acoustic treatment is required and the level of treatment required.
9	**Traffic and transport** • Construction and demolition activities will be restricted to: o Monday to Friday: 7 am to 6 pm. o Saturday: 7 am to 1 pm. • Heavy vehicles accessing the Proposal Area will be spaced evenly throughout the day where possible. • Any road closures to changed traffic conditions to be minimised, and timed to not interact with busy periods. • The CEMP will include a TMP to manage minor traffic disruption impacts. The TMP will cover both construction and demolition traffic generation. It will document standard traffic controls such as: o Identification of the approved heavy vehicle access route to be used by heavy vehicles. Approved access routes to be communicated to transport companies prior to delivery of equipment and materials. o Demarcation of site access roads, internal access tracks, and parking for construction workers, with this information to be included in site inductions. o Signage to be placed along major roads to warn drivers of construction work and vehicles entering and exiting the Proposal Area. o Notifying local residents and businesses (e.g. LMWQCC) of potential traffic disruptions, providing details such as the expected dates and timing of the disruption and the nature of the disruption (e.g. lane closures). Deliveries will be scheduled to occur outside of peak commuting periods where practicable.

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	• The TMP will be implemented by qualified personnel from either the construction contractor or a separate temporary traffic management company. It will include procedures for monitoring the effectiveness of traffic controls, and be adaptive and able to be updated in response to the identification of any inadequate controls. • The GJV will liaise with relevant road authorities to confirm appropriate controls needed on transit routes to ensure that heavy vehicles can safely travel along these roads. In particular, the following road authorities will be engaged: o ACT City Services will be consulted to determine whether special permission is required to use Uriarra Road, given that this road is currently primarily used by heavy vehicles associated with just forestry and livestock. ACT City Services will also be consulted in relation to the use of Pro Hart Avenue, specifically the section which is not part of the approved heavy vehicle network. o ACT City Services and Transport for NSW (TfNSW) will be consulted to confirm whether access via Fairlight Road is suitable for the Proposal's heavy vehicles, or if other roads need to be utilised to avoid the bridge at Uriarra Crossing. Any temporary traffic management (TTM) measures required to manage heavy vehicle movements will also be determined in collaboration with these agencies. o TfNSW will be consulted to confirm whether special permission and/or any TTM measures are required along the NSW section of Parkwood Road, as this road is not listed as a heavy vehicle route under NSW legislation. • Existing access tracks will be used for demolition activities. No additional clearing permitted. • Existing access tracks will be used for construction where marked on maps, with widening and formalisation only to occur where required for heavy vehicle access. • Construction of access tracks will be subject to erosion and sediment control, weed management, and rehabilitation where appropriate. • Additional consultation will be undertaken with rural landholders and land managers prior to construction and demolition activities to confirm access track locations, and document any requirements for their use, timing restrictions or rehabilitation. • The traffic controls will be implemented in conjunction with soil and dust management controls associated with vehicle movements throughout the Proposal Area. For example, all loads will be covered to ensure that no materials or dust are lost from moving vehicles. Refer to Item 4 above for further information on the management of soil impacts, and Item 10 below for further information about dust management. • As part of the CEMP, pest and weed management and appropriate waste disposal measures will be implemented to manage the risk of litter and other pollutant dispersal from construction and demolition traffic and potential impacts on biodiversity. Refer to Item 2 above for further information. • The CEMP will include a complaint handling procedure for traffic management, ensuring feedback from the community is communicated to the GJV for integration into the CEMP and sub-plans.
10	**Air quality and climate change** • The CEMP will contain measures for minimising dust emissions during construction, including: o Civil works to be staged to minimise areas of exposed soil, where practicable. o Site to be rehabilitated/revegetated as soon as possible following construction and progressively throughout construction.

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	o Silt and other materials to be removed from around the sediment and erosion control structures to prevent the deposits from becoming a dust source. o Vehicle speeds to be limited on any unsealed/non-gravelled areas. o Trucks to be covered when transporting dry earth material such as spoil. o Site entrances to be cleaned as needed to prevent the build-up of soil that could become airborne. o Dust generating activities to cease during high winds until dust suppression can be undertaken. o Dust suppression to be used on exposed soil and/or stockpiles to control any visible dust plumes. Water or similar (e.g. Spraygrass) would be used. Refer to Item 3 above for further information about stockpile management. • The CEMP will include measures for minimising emissions from vehicles and machinery during construction, including: o Vehicles and machinery to be switched off when not in use to avoid idling and reduce air emissions. o Vehicles and machinery to use fuels as per the requirements of the Commonwealth *Fuel Quality Standards Act 2000* and Fuel Quality Standards Regulations 2019 as accessible (e.g. for diesel a sulfur content of less than 10 parts per million is stipulated), and be fitted with appropriate emission control equipment, maintained frequently, and serviced in accordance with manufacturer specifications. o Only machinery that complies with relevant emissions standards to be used on site. o Heavy vehicles to be serviced off site, unless an unexpected failure occurs while in operation on site. Any emissions filters or catalytic converters are to be tested for integrity. If found to be defective, they are to be replaced prior to equipment use on site. o Locally sourced materials to be used where possible to reduce transport vehicle fuel use and emissions. • The Proposal's construction schedule will be shared with developers in the vicinity of the Proposal Area who will be undertaking ground disturbing activities at the same time as Proposal construction (e.g. Ginninderry, and Neoen for the Territory Battery), to identify staging opportunities to minimise concurrent emissions. • The following measures will be implemented to minimise greenhouse gas emissions from the Proposal: o Construction services and materials to be procured locally where possible, to minimise the distance travelled and therefore emissions of vehicles accessing the site. o Materials used during construction to be selected with a view of reducing the embodied energy of the products. o Energy-efficient work practices to be implemented where possible, such as switching off construction plant, vehicles and equipment when not in use to minimise idling and reduce air emissions. o Vegetation clearance to be limited to the minimum that is required for the Proposal. o Cleared vegetation to be disposed of at a registered compost facility in the Canberra region. Vegetation will not to be sent to landfill or burnt. o Measures for additional emissions mitigation to be identified during site inductions, training and pre-start talks.

Item	Mitigation and Management Measures
11	**Materials and waste** • Waste management procedures will be detailed in the CEMP to manage waste generated during Proposal construction. Some waste generated by the Proposal will be able to be reused and recycled in accordance with the waste management hierarchy (reduce, reuse, recycle, recover, disposal), but other waste will need to be disposed of to landfill. The waste management strategies to be implemented for each of the main types of materials involved in Proposal construction include: o The steel transmission towers removed from Lines 1 and 7 will be cut into pieces during demolition and transported off-site for recycling and repurposing. o The electrical cabling removed from Lines 1 and 7 will be stripped using Transgrid's steel separator, allowing the outer aluminium layer to be separated, collected and smelted into new products, and the steel core to be recycled. o Concrete removed from the Line 1 and 7 tower foundations will be reused or recovered at an ACT facility such as the Mitchell Resource Management Centre or ACT Recycling. o Cut and fill plans will aim to achieve a balance to minimise the generation of excess volumes of spoil that need to be transported off site for reuse or disposal. o Soil excavated from site will be reused as fill where possible to minimise the volume of spoil that needs to be removed from site. Pre-construction soil testing will be done to identify soil that can be reused. o Fill, suspected contaminated material or building wastes will be segregated and stockpiled on site, and tested in accordance with the ACT's requirements for the reuse and disposal of contaminated soil (EPA e, n.d.) prior to reuse or disposal. o The trees and other vegetation to be removed during construction will be clearly demarcated on site to avoid accidental clearance of any vegetation and excess generation of green waste. o Green waste will be disposed of at a green waste recycling facility. Green waste skip bins will be used on site during construction if required. o Any invasive weeds in the construction footprint will be managed using chemical and physical methods as appropriate, in accordance with the ACT Weeds Manual (Southern ACT Catchment Group, 2023). Weed management controls will be detailed in the CEMP (see Item 2 above for further information). o Packaging waste will be recycled where possible or disposed to landfill. The waste will be separated into waste streams as identified in the CEMP and recycled or disposed of accordingly. Skip bins will be used on site during construction, and regularly emptied. o Separate waste and recycling bins will be provided on site to allow for food waste to be recycled where possible. o Human waste will be captured in portable toilets on site during construction and emptied regularly. • The head construction contractor will provide instructions and training to construction staff on appropriate waste management procedures as detailed in the CEMP. The need to recycle materials where possible will be included in site inductions and reiterated in toolbox talks.

Item	Mitigation and Management Measures
12	**Socio-economic** • The GJV, in conjunction with Transgrid, will continue to engage with stakeholders and the broader community during Proposal construction and operation. • Socio-economic impacts arising from impacts on local amenity will be managed in accordance with the CEMP and relevant sub-plans. Refer to Item 8 above for information about noise and vibration management, Item 10 above for dust management measures, Item 7 above for managing visual impacts, and Item 9 above for traffic management measures. o Lighting during construction will be limited to any periods of poor ambient light when safe work conditions require artificial lighting, and would be directed towards the construction footprint and away from sensitive receptors. • Potential electromagnetic field (EMF) impacts will be managed as described in Item 14 below.
13	**Bushfire** • A Bushfire Emergency Management and Operations Plan (BEMOP) will be prepared to identify all relevant risks and mitigation measures associated with construction and operation of the Proposal. The BEMOP will include detail about the following: o Measures to prevent or mitigate fire ignition. o Work that should not be carried out during total fire bans. o Location and availability of fire-suppression equipment, access, and water supply. o Storage locations of fuels and any other flammable materials. o Procedures for notifying the Emergency Services Agency (ESA) about any works that have the potential to ignite surrounding vegetation which are proposed to be carried out during a bushfire danger period, to ensure weather conditions are appropriate. o Bushfire emergency management planning. • The BEMOP will identify appropriate procedures for construction and maintenance staff to follow in the event of a bushfire and contain the following minimum requirements: o Name and address of facility. o Contact details (including phone number). o Number of employees/contractors. o Details about the primary action procedure (evacuate or take shelter), including the location or address of the primary action. o Details about back-up/pre-emptive procedures, including the location or address. o Assembly point(s) and/or transportation arrangements for an evacuation. o Action statements for before, during and after a bushfire. o Site layout of the Proposal, including the location of construction compounds and site offices.

Item	Mitigation and Management Measures
	o Employee list and contact details. • The detailed design process will also ensure there is appropriate access to the Proposal Area for fire-fighting operations, including: o The access tracks will be designed to have an average width of 5 m (4 m with 6 m-wide passing bays) to satisfy Transgrid transmission line access standards consistent with the NSW RFS (2016) Fire Trail Standards. o Access roads will be designed and constructed to withstand the 40 t load capacity of Transgrid maintenance vehicles and fire-fighting appliances. o Temporary and permanent access gates will have a minimum opening width of 3.6 m. • Fire protection measures that will be undertaken during construction of the Proposal will be detailed in the CEMP and/or BEMOP. They will include: o Activities involving heavy earthmoving equipment and hot works such as grinding and welding will not be undertaken during declared Total Fire Ban days. o Heavy machinery such as bulldozers and excavators will not be used in areas with surface rock during periods of high fire danger, which coincide with the official bushfire season in the ACT (1 October to 31 March). o The head construction contractor will provide a suitable fire response tanker trailer at each site office during periods of high fire danger. The tanker trailer(s) will have a minimum water storage capacity of 1,000 L and contain a 30 m-long fire hose and nozzle and two rake-hoes. o All vehicles and machinery will be equipped with portable fire extinguishers. If emergency work must be undertaken during extreme or catastrophic fire danger weather, the ACT Rural Fire Service (RFS) will be contacted to arrange for construction staff to be accompanied if required. • During Proposal operation, the transmission line easements will be regularly inspected during the fire danger period, and the grassland vegetation managed to maintain a maximum height of 200 mm when the grassland vegetation reaches 70% cured. • All Proposal equipment will be regularly maintained and serviced in accordance with manufacturer requirements to minimise the possibility of failure and associated safety risks, such as the risk of fire ignition. The GJV and Transgrid (including contractors) will comply with all relevant standards during design, construction, and maintenance to ensure that the Proposal operates efficiently and as intended.
14	**EMF / EMI** • Existing known metallic infrastructure will be subject to further investigation during detailed design to ensure that above ground and underground metallic objects are isolated and electrocution risks to construction personnel are minimised. All metallic infrastructure that is within one of the new transmission line easements will be tested to ensure that the earthing and isolation complies with Transgrid fencing guidelines (Transgrid, 2016). • Construction areas will be securely enclosed during construction to prevent unapproved access to the site. Security fencing will be installed as early as possible during construction, and only dismantled in the final stages of construction once equipment has been removed from site.
15	**Utilities** • All utilities in the vicinity of the Proposal Area will be marked on site plans and communicated to construction personnel during site inductions and toolbox talks. The locations of these utilities will be verified prior to excavation. • Engagement with Icon Water and Evoenergy will continue during detailed design to deconflict any clearance or earthing concerns.

Item	Mitigation and Management Measures
	• The CEMP will include protocols for communicating to adjacent utility owners about construction work that could impact each of the utilities listed in **Table** 15.3. Information to be provided to utility owners will include the nature of the work (e.g. excavation, heavy vehicle traffic movements), timing of the planned work (dates and time of day), and contact details for the GJV/Transgrid and head construction contractor. The GJV will continue to engage with the relevant utility owners throughout the life of the Proposal as required. • Potential indirect impacts on nearby utilities and utility staff relating to construction vibration, noise and increased traffic from the Proposal, will be mitigated and managed in accordance with the measures specific to each matter. Refer to Item 8 above for more information about noise and vibration mitigation measures and Item 9 above for the traffic mitigation measures.
16	**Aviation** • The GJV will contact the EPSDD prior to construction commencing, to clarify how the National Airports Safeguarding Framework is applied in the ACT and what the requirements are for transmission lines. • It is anticipated that the GJV or Transgrid will need to notify airport operators (e.g. for Canberra Airport, Wallaroo Airstrip, Hall Airport, Wee Jasper Airport and Gundaroo Airport) and relevant authorities (e.g. Airservices Australia, ACT RFS and ACT F&R) of the changes to the transmission line locations, so that they can update their records and ensure the new infrastructure is avoided during flights.

19.2 Monitoring and Reporting

Monitoring and reporting will be undertaken in accordance with the management commitments outlined in **Section 19.1**, the details of which would be included in the CEMP and its sub-plans. In general, the CEMP will identify the scope, objectives, frequency, duration, reporting requirements and responsible party for each monitoring activity to be undertaken, such as workplace inspections and internal and external audits. The CEMP will also identify which monitoring reports are to be provided to the EPSDD, DCCEEW and any other government agencies. It is expected that the audit reports would be provided at a minimum.

The CEMP will identify the corrective actions to be taken in the event of poor performance against the KPIs. The CEMP and sub-plans (as applicable) will be adaptive documents that are continuously updated to ensure that mitigation and management measures remain fit-for-purpose.

19.3 Indicative CEMP Outline

An industry best practice CEMP will be prepared for the Proposal prior to construction. The CEMP will detail the measures required to address identified and potential environmental risks and impacts and to manage unexpected finds during construction of the Proposal. It will form the framework for management, accountability, monitoring and reporting on the environmental performance of the Proposal's construction.

The head construction contractor will be required to prepare the CEMP and its sub-plans and protocols, and to have all relevant documentation approved by the EPSDD, DCCEEW and other agencies (where applicable). The CEMP will likely contain the information shown in the indicative CEMP outline in **Table 19.2**. The sub-plans listed in **Table 19.2** will either be prepared as separate sub-plans and attached to the CEMP, or be integrated directly into the CEMP.

The Site Rehabilitation Plan, Bushfire Emergency Management and Operations Plan, and Stakeholder Engagement Plan will be prepared separately to the CEMP and be standalone documents that are used throughout the lifetime of the Proposal.

Table 19.2 Indicative CEMP Outline

Section	Content of Section
Introduction	• Project description. • Scope and objectives of the CEMP. • Outline of the CEMP.
Site location and features	• Site location and approved clearance boundaries. • Site features, e.g. entry points, fencing, sensitive ecological areas (BGW, NTG, PTWL habitat, mature hollow-bearing trees), known Aboriginal heritage sites, and nearby waterbodies. • Maps. • Construction hours.
Risk register	• Environmental risks. • Other risks.

Section	Content of Section
Roles and responsibilities	• Organisational structure. • Key responsibilities of: o The GJV. o Transgrid. o Construction/project manager. o Site manager. o Work health and safety manager. o Head construction contractor. o Construction subcontractors. o Environmental consultants, e.g. auditor, archaeologist, ecologist.
Communication	• Consultation plans (informed by the Stakeholder Engagement Plan). • Internal communication procedures, e.g. daily pre-start meetings, toolbox talks. • External communication procedures. • Landholder communications. • Inductions. • Site attendance, including visitors and deliveries. • Event notification and incident investigation. • Dispute resolution.
Environmental management controls and KPIs	• Controls for each environmental risk, cross-referencing sub-plans where available: o Biodiversity management, including trees and flora and fauna management, progressive rehabilitation and cumulative impacts. o Approved disturbance areas boundaries. o Weed management, including *Phytophthora cinnamomic* protocols. o Unexpected finds protocols for heritage and contamination. o Stockpile and spoil management including separation of materials/waste types. o Sediment and erosion control. o Fuels and chemical storage and management. o Air quality control, including vehicle/plant and dust emissions. o Traffic management. o Noise and vibration control. o Bushfire risk. o EMF impacts.
Emergency response	• Emergency response contacts and procedures.
Reporting	• Related GJV/Transgrid/head construction contractor policies and systems, e.g. for work health and safety and the environment. • Notifiable events. • Work health and safety. • Environmental inductions/training. • Monitoring reports.

Section	Content of Section
Monitoring and review	• Objectives and targets. • Internal auditing requirements and procedures. • External auditing requirements and procedures. • Complaints, non-conformances and corrective actions. • Review and control of the CEMP and risk register. • Measuring emergency response effectiveness.
Appendix A	• Induction register.
Appendix B	• Complaints register.
Appendix C	• Sub-plans: o Erosion and Sediment Control Plan. o Unexpected Finds Protocol – Contamination. o Unexpected Finds Protocol – Aboriginal cultural heritage. o Construction Noise and Vibration Management Plan. o Traffic Management Plan. o Dewatering Plan (if required).
Appendix D	• Monitoring checklists.
Appendix E	• Construction plans.

20.0 Conclusion

This Environmental Impact Statement (EIS) relates to the proposed Upper and Lower Tumut 330 kV transmission line realignment (the Proposal), which involves relocating part of the Upper and Lower Tumut transmission lines near their point of connection in the Australian Capital Territory (ACT). The two transmission lines extend from Kosciuszko National Park in New South Wales (NSW), through Brindabella National Park in the ACT, before exiting and then re-entering the ACT near Uriarra Village in the ACT.

Having regard to the various environmental considerations associated with the Proposal, including the principles of ecologically sustainable development, the development of the Proposal is justified for the following reasons:

- The Proposal plays an important role in the Ginninderry residential development. The removal of sections of existing transmission lines within the West Belconnen future urban area (FUA) would increase the availability of land to be developed for housing, including affordable housing.
- The removal of the existing transmission lines would improve visual amenity for the West Belconnen residential areas. It would also remove infrastructure from within the Ginninderry Conservation Corridor (GCC) and Woodstock Nature Reserve, improving conservation outcomes and visual amenity in these areas.
- The removal of the existing transmission lines would allow for vegetation restoration within the current easements located within the GCC and Woodstock Nature Reserve, improving conservation outcomes and visual amenity in these areas, and reducing ongoing operational impacts into the reserve.
- The Proposal would have net benefits for both the Ginninderry Joint Venture (GJV) and other parties, including landholders, Transgrid (as the future owner and operator of the assets), and public land users, including:
    - Creation of additional residential lots, including affordable housing (a benefit to the GJV and current/future landholders).
    - Value uplift for future lot sales due to the removal of existing transmission lines near Ginninderry (benefit to the GJV).
    - Improved visual amenity due to the removal of existing transmission lines near Ginninderry (benefit to Ginninderry residents, nearby rural landholders, and visitors to public reserve areas including Shepherds Lookout, the GCC and the Molonglo and Murrumbidgee River corridors).
    - Payment for easements (benefit to host landholders).
    - Net reduction in transmission line maintenance costs due to reduction in length of transmission lines (benefit to Transgrid).
- The Proposal would assist with ensuring reliability in the electricity network.
- The Proposal would create jobs, primarily during construction and demolition.

This EIS has demonstrated that the Proposal would not result in any environmental, heritage or socioeconomic impacts that cannot be appropriately managed, and has demonstrated a strong commitment to avoidance and minimisation of impacts.

- All avoidance, mitigation and management measures for threatened species and ecological communities have been developed by taking into consideration relevant Commonwealth and Territory statutory documents, including conservation advices, recovery plans and threat abatement plans.
- The overall effectiveness of control measures to achieve the avoidance and minimisation of biodiversity impacts is considered high, as the measures are largely linked to standard construction management practices such as site access control, erosion and sediment control, and weed management. Salvage prior to or during construction for fauna and hollow-bearing trees is frequently undertaken in the ACT, and standard procedures are available to ensure these activities are undertaken in an effective manner.
- The Proposal is therefore consistent with the principles of ecologically sustainable development and with relevant land use and planning controls for the site.

Although the Proposal will impact on superb parrot and gang-gang cockatoo habitat, this has been determined not to be significant by DCCEEW. Compensatory measures will be developed to mitigate losses within the landscape.

The Proposal will benefit the community, and the commitments presented are realistic and achievable, with transparent governance and funding arrangements.

The EIS has addressed the issues outlined within the Proposal's EIS Scoping Document (**Appendix A**) and satisfies the objectives and requirements of the *Planning and Development Act 2007*. The future Development Application will satisfy the requirements of the *Planning Act 2023*. In light of these merits, it is requested that the application be approved.

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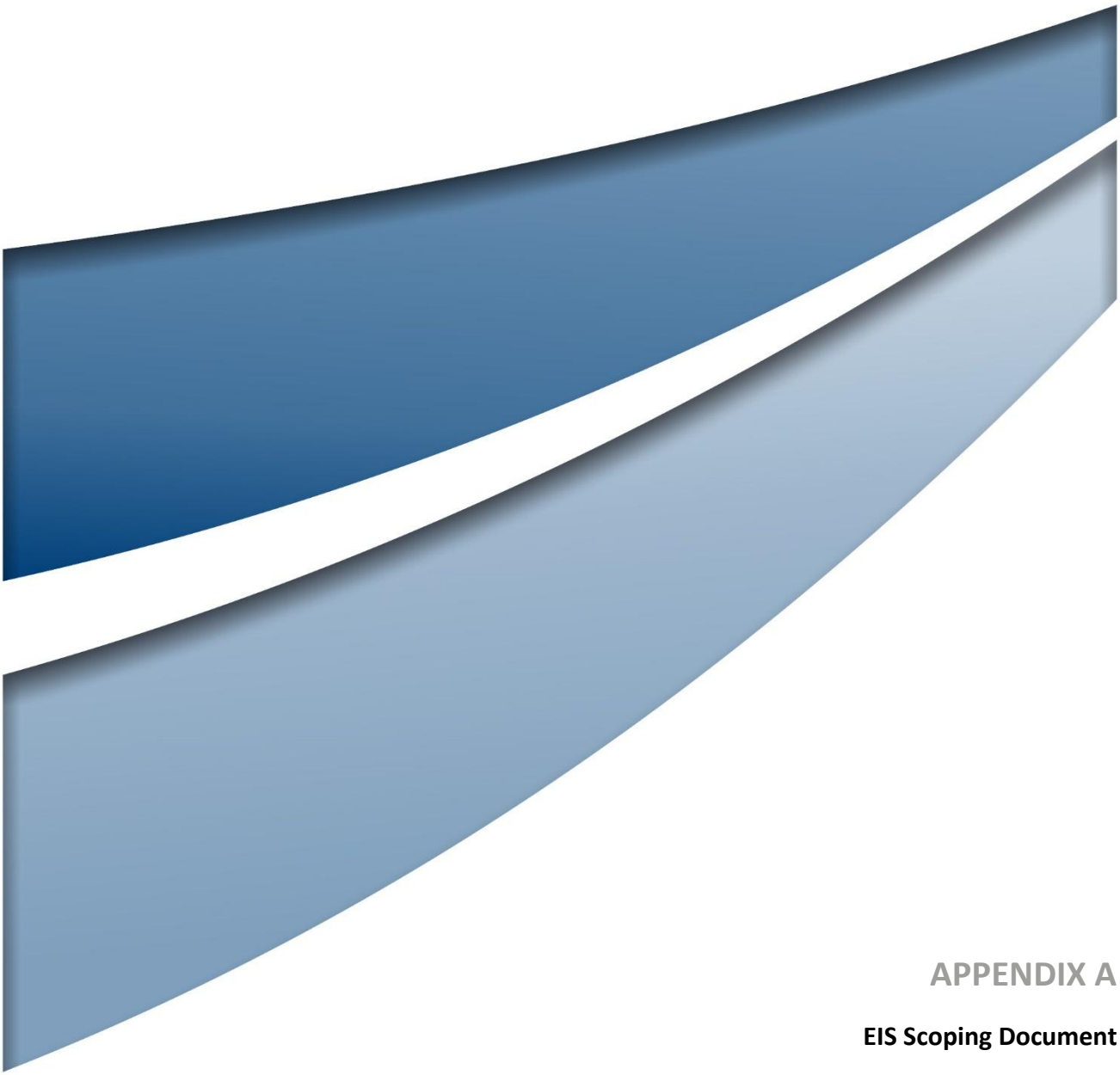
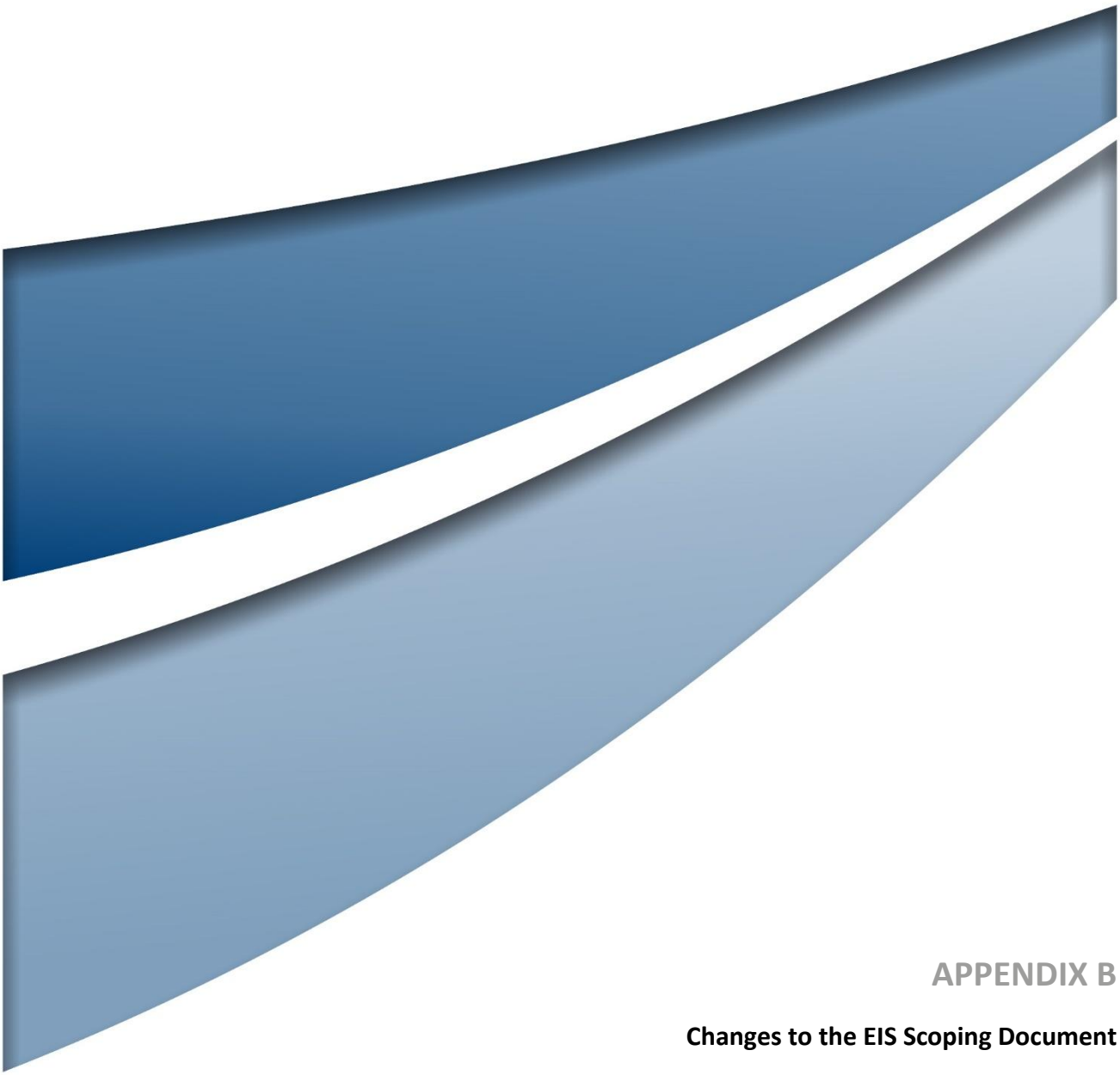


APPENDIX A

EIS Scoping Document

EIS Scoping Document PDF to be inserted



APPENDIX B

Changes to the EIS Scoping Document

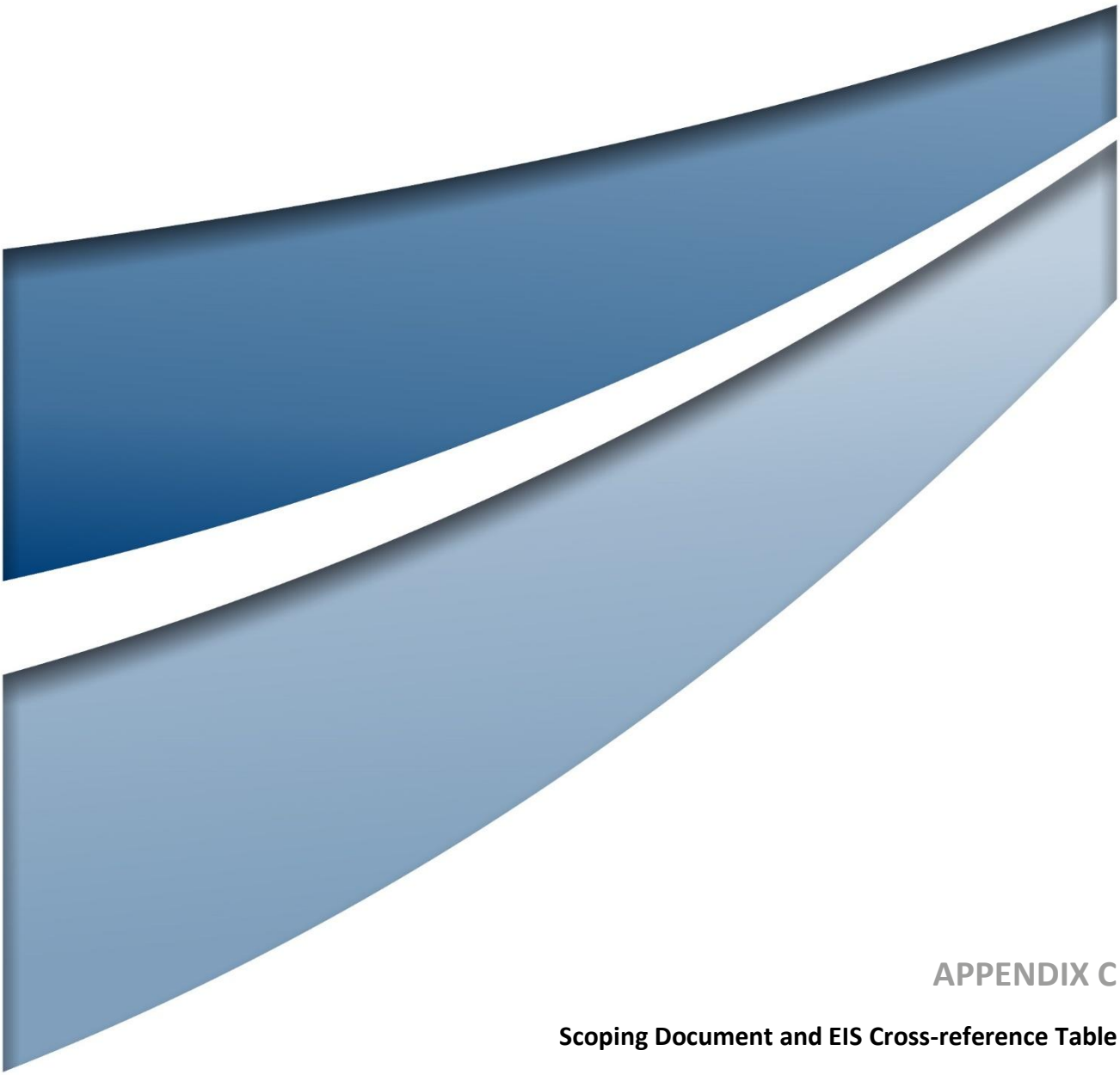
Table B.1 details the changes made to some of the entity requirements in the EIS Scoping Document, as agreed via meeting with the relevant entities.

Table B.1 Agreed Changes to the Entity Requirements in the EIS Scoping Document

Entity	Page of Scoping Document	Initial Requirement	Revised Requirement
The Conservator of Flora and Fauna	20–21	Impacts to flora and fauna 4. Areas of groundcover dominated (most abundant species) by either *Themeda australis* or *Microlaena stipoides* must be mapped and additional survey for *Thesium australis* undertaken. 2023 was a poor season for this species in the local region and even large populations could not be found. Therefore, the results of the one-off survey cannot be taken as proof of absence.	[15 August 2023] The Conservator's team clarified that when looking for potential *Thesium australe* habitat, areas of groundcover dominated by either *Themeda australis* or *Microlaena stipoides* must be considered as suitable habitat. Greg Bains considers that October – February is a suitable survey period for *Thesium australe.*
The Conservator of Flora and Fauna	21–22	Impacts to flora and fauna 10. Superb Parrot (SP) ACT Government research has shown that there is >50% likelihood that a tree is suitable for SP nesting if the tree has the following attributes: • tree species is *Eucalyptus rossii* or *Eucalyptus blakelyi*; and • trunk diameter at breast height >70 cm; and • >9 tree hollows (with entrance size >4 cm) are visible from the ground. If any trees within the impact zone fit these criteria their removal would be classified as significant, given that the transmission line is only 2.5 km from a highly productive SP breeding colony. Further, it is because SPs have high breeding site fidelity (as Umwelt notes) that opportunities to restore and extend SP breeding habitat are limited to landscapes that contain extant breeding colonies (as this one does). Therefore, piecemeal reduction of this potential habitat area is an important threat to avoid. The EIS must include an assessment of the area circled in red overleaf for trees that meet criteria underlined above and any impacts to any identified suitable trees if avoidance is not possible.	[15 August 2023] The Conservator's team clarified that suitable nesting trees (as per the criteria in the Scoping Document) are to be assessed within the red circle area within the impact footprint + 300 m buffer (i.e. not within the entire red circle).

Entity	Page of Scoping Document	Initial Requirement	Revised Requirement
		Finally, due to the Parkwood development area, landscape connectivity between the breeding colony and critical SP foraging habitat (circled purple below) through the southern boundary of Woodstock Nature Reserve is important. Research shows that trees 10 – 15 m in height support SP movement, so their removal should be avoided within the area circled red overleaf. The EIS must include a tree assessment of this area and identification and assessment of any impacts to trees that contribute to SP movement.	
The Conservator of Flora and Fauna	22	11. Golden Sun Moth A more robust assessment of significant impact is required for the Golden Sun Moth (*Synemon plana*). Preliminary distribution models for the species that focus on dispersal limited females, indicate that the area may hold moderate to high quality habitat for Golden Sun Moth (based on a combination of abiotic and landscape features identified at good condition sites across the ACT). The comments of the consultants appear to be at odds with the modelling ACT Government have been developing. More rigorous assessment of Golden Sun Moth habitat and population, during suitable survey periods should be included in an assessment of impact.	[15 August 2023] The Conservator's office agreed to provide shapefiles showing the preliminary GSM distribution models for Umwelt to identify areas that may contain moderate to high quality habitat that would be impacted by the Proposal. Umwelt committed to undertaking another season of targeted GSM surveys in the impacted areas where vegetation assessment by Umwelt has confirmed the presence of potential GSM habitat.
Utilities Technical Regulator	24–25	Although the proposed project has only been described as "330 kV Transmission Line Realignment", the project in fact also includes a change of electrical network configuration due to the reconnection of one of the transmission lines to a different TransGrid Substation, and may also include other connection changes within substations. This change can potentially affect the long-term electrical supply capacity available to the ACT under certain contingency event situations, and must therefore be included in the EIS Scoping Document for impact assessment. Accordingly, the following information is required for a loss of substation contingency event: a. For loss of Canberra substation event, what is the electrical supply capacity immediately available to the ACT i. Before the proposed Line reconfiguration. ii. After the proposed Line reconfiguration.	[16 August 2023] The GJV clarified that the Proposal does not involve changes to any transmission line connections or configurations at the Stockdill or Canberra Substation (the existing connections are simply being replaced). As such, the UTR agreed that potential impacts relating to connection changes do not need to be assessed in the EIS.

Entity	Page of Scoping Document	Initial Requirement	Revised Requirement
		b. For Loss of Stockdill substation event, what is the electrical supply capacity immediately available to the ACT i. Before the proposed Line reconfiguration. ii. After the proposed Line reconfiguration. c. For Loss of Williamsdale substation event, what is the electrical supply capacity immediately available to the ACT i. Before the proposed Line reconfiguration. ii. After the proposed Line reconfiguration.	



APPENDIX C

Scoping Document and EIS Cross-reference Table

Table C.1 Scoping Document and EIS Cross-reference

Requirement	Location in EIS
General requirements	
1. Cover page	
The cover page must clearly display the following: • The name of the proposal (project title). • The block identifier(s) and street address for the proposal. • The date of the preparation of the document. • Full name and postal address of the designated proponent. • Full name and postal address of the designated applicant. • Name and contact details of the person/organisation who prepared the documents (if different to the above).	Title page (second page)
2. Glossary	
Provide a glossary of technical terms, acronyms and abbreviations used in the EIS.	Abbreviations (page v) Glossary (page ix)
3. Executive Summary	
Provide a non-technical summary of the EIS including a description of the proposal, key findings, and recommendations.	Executive summary (page i)
4. Introduction	
Summarise the proposal background and justification for the proposal.	**Chapter 1.0**
5. Proposal details	
5.1. Project Description Provide a description of the proposal, including:	
a. The objectives and justification, with supportive evidence, for the proposal.	**Section 1.2** and **Section 1.3**
b. The location of the land to which the proposal relates, including detailed maps.	**Section 2.2.1**
c. The division and/or district names and block and/or section numbers of the land under the *Districts Act 2002*.	**Section 2.2.1**
d. If the land is leased – the lessee's name.	**Section 2.2.1**
e. If the land is unleased or public land – the custodian of the land.	**Section 2.2.1**
f. The purposes for which the land may be used.	**Section 2.2.1**

Requirement	Location in EIS
g. A clear identification of all lands subject to direct disturbance from the proposal and associated infrastructure and geomorphic features such as waterways and wetlands. This is to be supported by a map showing all affected lands. h. An outline of any developments that have been, or are being, undertaken by the proponent, or other person(s) or entities, within the proposal area and broadly in the region. Describe how the proposal relates to these developments. i. A description of all the components of the proposal, including the proposal specifications, the predicted timescale for implementation (design, approvals, construction and decommissioning) and project life. j. A plan/description of the precise location of any works to be undertaken, structures to be built or elements of the proposal that may have relevant impacts. k. A description of the construction methodologies for the proposal.	**Section 2.2** **Section 2.2.3** **Section 2.3** **Section 2.3** **Section 2.3.2**
5.2. Alternatives to the proposal Provide details of any alternatives to the proposal considered in developing the proposal including a description of: a. Any design and location alternatives to the proposal and provide reasons for selecting the preferred option with an analysis of site selection as an attachment to the EIS. b. The criteria used for assessing the performance of any alternative to the proposal considered. c. Any matters considered to avoid or reduce potential impacts prior to the selection of the preferred option. d. Details of the consequences of not proceeding with the proposal.	**Section 2.4**
6. Legislative and Strategic Context	
A description of the EIS process including any statutory approvals obtained or required for the proposal, and how the proposal is aligned with strategic priorities for the ACT.	**Chapter 3.0**
6.1. Statutory requirements The description must include information on statutory requirements for the preparation of an EIS: • *Planning and Development Act 2007* (including confirmation of relevant Schedule 4 triggers based on impacts identified in the scoping document and any studies undertaken in preparing the draft EIS) • Planning and Development Regulation 2008 • *Heritage Act 2004* • *Nature Conservation Act 2014* • *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) • Environment Protection and Biodiversity Conservation Regulations 2000 (Commonwealth)	• ACT statutory requirements: **Section 3.1.1** • Commonwealth statutory requirements: **Section 3.1.2**.

Requirement	Location in EIS
• related statutory approvals.	
6.2. Other requirements The description must also include information on how the proposal is consistent with each of the following: • Territory Plan 2008, including the Statement of Strategic Directions (Section 2.1) • ACT Planning Strategy • National Capital Plan • *Climate Change and Greenhouse Gas Reduction Act 2010* • The ACT Climate Change Strategy 2019–2025 • relevant Environment Protection Policies and Separation Distance Guidelines for Air Emissions (https://www.environment.act.gov.au/environment/legislation_and_policies) • *Environment Protection Act 1997* • Environment Protection Regulation 2005 • Plans of Management for any public land • any relevant Master Plan • other relevant planning and environmental guidelines and management plans.	• Territory Plan, ACT Planning Strategy, National Capital Plan, ACT Climate Change Strategy: **Section 3.2** • *Climate Change and Greenhouse Gas Reduction Act 2010*: **Section 3.1.1.10** • EPPs: **Section 3.1.1.4** • Separation Distance Guidelines for Air Emissions: Not applicable • EP Act and EPR: **Section 3.1.1.4** • Plans of Management: **Section 3.2.6**.
6.2.1. Ecologically sustainable development (ESD) Provide a description of how the proposed development demonstrates ESD. This is to include long-term and short-term considerations related to economic development, social development, and environmental protection at local, regional, and national scales. The proponent should ensure that the EIS adequately addresses the ESD principles as defined by section 9 of the PD Act.	**Section 3.3**
6.2.2. Territory Plan strategic directions A statement must be provided regarding the proposal's consistency with the principles in the Statement of Strategic Directions in the Territory Plan 2008 (Section 2.1 – Strategic Direction).	**Appendix H**
Requirements for Addressing Impacts in the EIS	
7. Risk Assessment	
7.1. Risk Assessment Methodology Provide a risk assessment in accordance with the Australian and New Zealand Standard for risk management AS/NZS ISO 31000:2009	• Risk assessment methodology: **Chapter 4.0**.

<table>
<tr><th>Requirement</th><th>Location in EIS</th></tr>
<tr><td>
Risk Management – Principles and guidelines. The proposed criteria for determining which risks are potentially significant impacts must be described.
<table>
<tr><th colspan="4">Assessment guide</th></tr>
<tr><td colspan="4">Provide a table with the headings below to describe the risks identified and the original risk rating without any mitigation strategies in place. This table format is one option, however alternative formats can be used provided the methodology is clearly described and in accordance with AS/NZS ISO 31000:2009 Risk Management – Principles and guidelines.</td></tr>
<tr><td>Risk</td><td>Likelihood</td><td>Consequence</td><td>Risk rating</td></tr>
</table>
The Preliminary Risk Assessment (PRA) submitted as part of the request for a scoping document must be revised to include, but not be limited to, the risks identified by the Authority in Table 1. The risks identified in Table 1 are based on the scoping document application and comments received from entities on the application. All of these risks are considered potentially significant (i.e. medium risk level or above) and must be addressed in the EIS. Should any risk levels change during the preparation of the EIS or any new risks become apparent, these must be assessed and included with a justification in the EIS, and where relevant, the residual risk assessment.
Table 1 – Identified impacts and requirements to be addressed in the EIS
<table>
<tr><th>Environmental theme</th><th>Risk identified</th><th>See Section/s below for further detail</th></tr>
<tr><td>Ecology and natural environment</td><td>• Impacts on fauna (including aquatic and arboreal species and threatened species such as Pink-tailed Worm-Lizard, Superb Parrot and Golden Sun Moth).
• Impacts on flora and ecological communities, including critically endangered Box Gum Woodland (BGW) and Natural Temperate Grassland (NTG).
• Removal of tree species suitable for Superb Parrot nesting.
• Clearance of native vegetation.
• Spread of invasive species/weeds off-site during construction.</td><td>Section 8.2.1</td></tr>
<tr><td>Heritage items and places</td><td>• Impact on heritage sites and objects.
• Impact on the heritage significance of the Huntly Heritage Homestead.</td><td>Section 8.2.2</td></tr>
<tr><td>Hazard and risk</td><td>• Impact of bushfire on the transmission line and associated infrastructure.
• Risk of the substation causing a fire or being damaged by fire.</td><td>Section 8.2.3</td></tr>
</table>
</td><td>
• A PRA and residual risk assessment are provided in each of the technical chapters (Chapter 5.0 to Chapter 16.0).
• Final residual risk assessment: Chapter 18.0.
</td></tr>
</table>

Requirement			Location in EIS
	• Safety hazards during demolition, construction and operation. • Safety impact of an electrical fault in relation to buried water and/or sewer pipes. • Unauthorised access to site and associated risk of contact with electrical equipment. • Potential flooding from rain or dam failure impacting the transmission lines.		
Planning and land status	• Incompatibility with current and known future land uses on adjacent sites.	Section 8.2.4	
Traffic and transport	• Traffic impacts during demolition/construction/operation. • Traffic damage to sensitive environmental and heritage items/areas.	Section 8.2.5	
Materials and waste	• Increased waste to landfill during demolition and construction. • Impacts from storage and disposal of materials.	Section 8.2.6	
Soils and geology	• Sediment and erosion during demolition and construction phases. • Impact from previously unknown soil contamination being exposed.	Section 8.2.7	
Utilities and services	• Impact on existing power infrastructure during demolition, construction and operation. • Impacts of removal of existing transmission lines and towers.	Section 8.2.8	
Landscape and visual	• Visual impact on landscape character.	Section 8.2.9	
Water and hydrology	• Impact on water quality in local waterways from runoff during demolition/construction. • Impact from potential flooding.	Section 8.2.10	
Health	• Impact of exposure to electro-magnetic fields (EMF) and frequencies associated with high voltage powerlines.	Section 8.2.11	
8. Assessment of Impacts			

Requirement	Location in EIS
8.1. Standard requirements Sufficient information is required to provide the Authority with an adequate understanding of the environmental impacts associated with the proposal. Each risk identified in Table 1, and in the proponent's PRA, must be addressed and structured as set out in Section 8.1.1–Section 8.1.5 below.	**Chapter 5.0** to **Chapter 16.0**
8.1.1. Environmental conditions and values Describe the environmental conditions and identify the environmental values for the environmental themes identified in Table 1. This section should discuss the baseline conditions for the area.	**Chapter 5.0** to **Chapter 16.0** (e.g. **Section 5.3**, **Section 6.3**)
8.1.2. Investigations Identify the findings and results of any environmental investigation in relation to the land to which the proposal relates.	**Chapter 5.0** to **Chapter 16.0** (e.g. **Section 5.2**, **Section 6.2**)
8.1.3. Impacts Describe the effects of the environmental impact as a result of construction and operation for the environmental themes identified in Table 1 and in the proponent's risk assessment (including cumulative, consequential and indirect effects) on physical and ecological systems and human communities. Particular emphasis should be placed on the potentially significant impacts identified in the risk assessment and this scoping document. Include a discussion of the timeframes of impacts i.e. short or long term, their nature and extent and whether they are reversible or irreversible, unknown or unpredictable. Include an analysis of the significance of the relevant impacts. Information must include any technical data and other information used or needed to make a detailed assessment of the relevant impacts.	**Chapter 5.0** to **Chapter 16.0** (e.g. **Section 5.4**, **Section 6.4**)
8.1.4. Mitigation and offsets Discuss the proposed safeguards and mitigation measures proposed to be taken for the environmental management of the land to which the proposal relates for the environmental themes identified in Table 1 and the proponent's risk assessment. This is to include: a. A description and an assessment of the proposed impact prevention, mitigation or offsetting measures to deal with the environmental impact of the proposal, along with which stage the mitigation measures will be adopted. b. Any statutory or policy basis for the mitigation measures. c. An outline of an environmental management plan (EMP) that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action, including any provisions for independent environmental auditing. d. The frequency, duration and objectives of monitoring proposed. e. The name of the agency responsible for endorsing or approving each mitigation measure or monitoring program.	• Avoidance, mitigation and management measures: **Chapter 5.0** to **Chapter 16.0** (e.g. **Section 5.5**, **Section 6.5**) • Offsets and Other Compensatory Measures: **Section 5.8.**

<table>
<tr><th>Requirement</th><th>Location in EIS</th></tr>
<tr><td>f. A description of the cost effectiveness of environmental mitigation or rehabilitation measures proposed and the expected or predicted effectiveness of those measures.

2. Proposed Offsets
If any offsets are required, the offset package must provide compensation for any unavoidable impacts arising from the proposal on listed threatened species and communities. The offset package must include, but not be limited to, measures to address the long-term protection and management of relevant listed threatened species and communities at offset sites in the ACT (or surrounding area) and may also include management measures to improve the ecological values. Further information on the provision of Commonwealth offsets is detailed in the EPBC Offsets Policy (2012) available from: http://www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy.
Offsets should directly contribute to the ongoing viability of protected matters impacted by the project and deliver an overall conservation outcome that improves or maintains the viability of protected matters as compared to what is likely to have occurred under the status quo, that is if neither the action nor the offset had taken place.</td><td></td></tr>
<tr><td>8.1.5. Residual risk
Provide a table that details the residual risk for the potentially significant impacts identified for the environmental themes in Table 1 and the proponent's risk assessment. A residual risk assessment is only required where the significance of impact is determined as medium or above. The calculation of the residual risk should take into account the influence of implementation of mitigation or offsetting measures on the impacts identified by the risk assessment. A discussion of how the calculations were determined should also be included, including the expected or predicted effectiveness of the mitigation measures.
<table>
<tr><th colspan="5">Assessment Guide</th></tr>
<tr><td colspan="5">Provide the residual risk assessment as set out in the table below.</td></tr>
<tr><td>Risk identified in Section 7.1</td><td>Original risk rating from items identified in 7.1</td><td>Residual likelihood</td><td>Residual consequence</td><td>Residual risk rating</td></tr>
</table>
</td><td>• Residual risk assessments: Chapter 5.0 to Chapter 16.0 (e.g. Section 5.2, Section 6.2)
• Final residual risk assessment: Chapter 18.0.</td></tr>
<tr><td colspan="2">8.2. Detailed requirements</td></tr>
<tr><td colspan="2">The following items (Section 8.2.1–Section 8.2.11), relate to the potentially significant environmental impacts identified in Table 1. They must be addressed in detail in the EIS.
Note: The information provided under the following headings is not an exhaustive list of matters that may be required to accurately detail the assessment scenarios.</td></tr>
<tr><td>8.2.1. Ecology and natural environment
• Provide a description of the ecological values (including native vegetation, endangered ecological communities and threatened species) and their habitat on, and adjacent to the site, including but not limited to:
o Yellow Box – Blakely's Red Gum Grassy Woodland (BGW)</td><td>Chapter 5.0</td></tr>
</table>

Requirement	Location in EIS
o Natural Temperate Grassland (NTG) o Pink-tailed Worm-lizard (*Aprasia parapulchella*, PTWL) o Superb Parrot (*Polytelis swainsonii*, SP) o Little Eagle (*Hieraaetus morphnoides*) o Perunga Grasshopper (*Perunga ochracea*) o Hoary Sunray (*Leucochrysum albicans*) o Gang-gang Cockatoo (*Callocephalon fimbriatum*) o Diamond Firetail (*Stagonopleura guttata*) o Scarlet Robin (*Petroica boodang*) o Southern White-face (*Aphelocephala leucopsis*) o Golden Sun Moth (*Synemon plana*) o Groundcovers including *Themeda australis* or *Microlaena stipoides.* • Ecological surveys must be undertaken by a qualified ecologist for each impacted species and their habitats. • Provide maps showing the location of all habitat and overlay all aspects of the proposed development to show the extent of any impact. • Describe the direct and indirect impacts on ecological values. The description must include all areas that may be impacted by the decommissioning, construction and installation of the transmission lines, including pole placement, laydown, access arrangements and any areas that will be impacted by maintenance works following completion of construction. • Consider the indirect impacts of the development on fauna species in relation to: o increased predation efficiency and predator abundance due to the erection of poles and lines adjacent to grasslands o increased mortality of birds due to collisions with power lines, with particular consideration for Superb Parrot and other avian species known to occur in the area. • Consider impacts of removal of tree species (*Eucalyptus rossii* or *Eucalyptus blakelyi*) suitable for Superb Parrot nesting and provide detailed assessment of the possible impacts on their breeding habitat. • Consider the impact of removing mature, hollow-bearing trees on connectivity for arboreal species.	

Requirement	Location in EIS
• Consider impacts on migratory species. • Consider the impact of weed spread due to soil disturbance and any key habitat that is at risk of being affected. • Detail any potential cross border impacts. • Describe measures for avoidance and mitigation of the impacts identified and, if proposed, any offset measures. • Outline alternative design options that have been explored to avoid or reduce the impact.	
8.2.2. Heritage items and places • Provide an in-depth heritage assessment of the site: o Consider direct and indirect impacts on known heritage values and any historical archaeological features and deposits identified through further research. o Consider the impact of the realignment on the heritage character / significance of the Huntly Heritage Homestead. • If testing or archaeological excavation is required to assess the heritage significance of the proposed development area, this investigation must be undertaken to inform the EIS. Where the application relates to Aboriginal places and objects, consultation with Representative Aboriginal Organisations (RAOs) regarding the proposed investigation should occur. • A Cultural Heritage Assessment (CHA) must be prepared by a suitably qualified heritage practitioner, and in consultation with RAOs covering the whole project footprint including any access roads and cabling infrastructure, in line with ACT Heritage Council requirements. • If Aboriginal places or objects are identified on site, design changes and/or management controls to avoid heritage impacts should be considered. • Develop a Conservation Management Plan that considers the impact of the proposed development on heritage items: o Survey and locate each item of heritage significance. o Describe the measures to be taken to prevent damage during construction. o Include a monitoring and evaluation framework to ensure that all items of heritage significance are protected during construction and operation and where impacts cannot be avoided present ways to minimise and mitigate heritage impacts. o Include an Unexpected Finds protocol for any additional items of heritage significance that may be identified during construction.	• **Chapter 8.0** • CHA: **Appendix G4** • Conservation Management Plan not required.

Requirement	Location in EIS
8.2.3. Hazard and risk • Consider the risk of a bushfire starting from malfunction of the project infrastructure (substation, faults in cable connections, weather impacts etc). • Consider the risk of bushfire during construction, including the cessation of construction works during periods of escalated fire danger. • Provide a detailed bushfire assessment report that considers the bushfire attack level of the project span and protection measures to be implemented in proximity to the infrastructure, including asset protection zones, vegetation management/fuel load reduction strategies. • Consider the safety impacts of an electrical fault in relation to buried water and/or sewer pipes. • Consider how separation to overhead conductors will be achieved for any firefighters undertaking asset protection in the event of a fire. • Consider potential safety hazards during the demolition, construction and operation of the proposal including: o Impacts of any hazards on residents, workers and the community. o Impacts of unauthorised access to site and associated risk of contact with electrical equipment. o Excessive step & touch potential due to Earth potential rise (EPR) or Electromagnetic Induction (EMI) on both in-service and abandoned metallic/conductive infrastructure such as pipelines, rural and urban fences, streetlight poles, telecommunication cables/cable pits. o The potential severity of hazards, with consideration given to current magnitude, time duration of current flow, soil electrical resistivity, earthing systems installed on both the impacted assets and the transmission line/substation infrastructure, proximity of metallic conductors (pipelines, unearthed fences, telecommunications lines as examples). o Electromagnetic Field (EMF) limits and any impacts on human health. • Provide details of mitigation and safety measures and evidence of compliance with Australian Standards AS 7000 and AS/NZS 4853, and other relevant Standards. • Consider possible Aircraft collision hazard due to the proposed heights of the poles.	• **Chapter 15.0** • Bushfire risk assessment: **Appendix G9**
8.2.4. Planning and land status • Include a description of planning context of the area where the project will be located. • Describe planning and development status of any land or project relevant to the proposal.	**Section 2.2** and **Chapter 16.0**

Requirement	Location in EIS
• Describe land use of the proposed land and any land to be affected (including, but not limited to, zoning, lessee(s) or custodian of the land, the permissibility of the proposed use defined in the Territory Plan).	
8.2.5. Traffic and transport • Consider damage to sensitive environmental and heritage items caused by construction vehicles accessing the site. • Describe arrangements for the transport of construction materials, equipment, products, wastes and personnel during demolition, construction and operation. • Include a description of the volume of traffic generated during demolition/construction and operation. • Include details of vehicle transit routes and transport of heavy and oversize loads (including types and composition). • Investigate the impact the development will have on traffic congestion and road safety and describe any mitigation measures that will be implemented. • A comprehensive Traffic Impact Assessment (TIA) must be prepared in accordance with the TCCS TIA Guidelines.	• Traffic and transport impact assessment: **Chapter 11.0** • Biodiversity impact assessment: **Chapter 5.0** • Heritage impact assessment: **Chapter 8.0** • TIA: **Appendix G7**
8.2.6. Materials and waste • Describe all materials to be stockpiled on site. • Investigate potential impacts of stockpiling materials, including any contaminated materials, and provide mitigation measures to reduce any impacts. • Provide detailed waste disposal procedure for the decommissioning of the existing poles and construction of the new infrastructure.	**Chapter 13.0**
8.2.7. Soil and geology • Describe the soil and geology features of the impacted area. • Describe the controls required to prevent spillage or runoff of soil into surrounding water bodies. • Describe how the site will be remediated if contaminated materials are found on site. • Describe impacts from clearing of vegetation in relation to erosion and sedimentation and measures to reduce the impacts. • Describe the composition and source of all fill intended for use at the site. • Provide a Sediment and Erosion Control Plan (SECP) that details measures to reduce the impacts of sediment and erosion, including dust suppression.	• **Chapter 6.0** • Preliminary ESCP: **Appendix G3** • An Unexpected Finds Protocol will be provided in the CEMP.

Requirement	Location in EIS
• Provide an Unexpected Finds Protocol (UFP) for all earthworks and construction activities on site.	
8.2.8. Utilities and services • Describe all existing utilities located on all land parcels subject to this proposal. • Describe any new utilities, removal or realignments required as a result of this development. • Investigate potential impacts to existing utilities and infrastructure and provide mitigation measures to reduce the impacts. • Consider impacts of decommissioning existing power infrastructure during demolition and construction phases. • Describe how the proposal will be designed, constructed, and maintained in accordance with the relevant Australian and International Standards.	**Section 15.5**
8.2.9. Landscape and visual impact • Provide a visual impact assessment that analyses the visual impacts of the development on surrounding residents, including residents in NSW. The visual impact assessment must: o Provide perspectives of the development from residential viewpoints and approach routes and provide a comparative assessment of existing and proposed views upon immediate surrounds and residential areas. o Identify impacts on important viewsheds, significant views and vistas to and from the site, and on residents surrounding the development. o Identify any measures to be adopted to reduce visual impacts.	**Chapter 9.0**
8.2.10. Water quality and hydrology • Provide an assessment of potential impacts to waterways (Murrumbidgee River/Molonglo River/Uriarra Creek / Swamp Creek) that may arise during demolition, construction and operation. • Describe any mitigation measures required to prevent sediment and erosion from impacting on water quality. • Describe current water flow across the proposal site and impacts from the proposal on water flow both on site and in the surrounding area/catchment. • Describe the current surface water and groundwater quality and measures proposed to maintain and monitor water quality. • Consider any potential flood risks and describe any mitigation measures to reduce the impact on the infrastructure. • Provide information on stormwater/wastewater management both during construction and operation including any on site detention, treatment systems and water quality protection measures. This should include consideration of any chemicals into	**Chapter 7.0**

Requirement	Location in EIS
the receiving environment. • Include the controls required to prevent spillage or leakage of hazardous materials into the surrounding groundwater and the mitigation measures to prevent the contamination of stormwater systems.	
Health • Consider any impact upon human health and safety as a result of exposure to electromagnetic fields (EMF) and frequencies associated with high-voltage powerlines, and compare this risk with national and international standards.	**Section 15.4**
8.3. Entity requirements The EIS must address the entities comments provided in Attachment B. If the issues raised by entities have been addressed in other sections of the EIS, this must be cross referenced.	See below.
9. Community and stakeholder consultation	
9.1. Consultation must be undertaken with: • Lease holders and land managers of land potentially impacted by the proposal. • Any recreational groups which may be affected by the proposal. • Any volunteer conservation, landscape management or land care groups active in the area to be affected by the proposal. • The local community; and businesses owners and employees.	**Chapter 16.0**
9.2. Provide a consultation report that includes: • A description of the methodology and criteria for identifying stakeholders and how they were identified. Details and plans must be provided showing potential impacts on the local and wider community to justify how stakeholders were identified. • An outline of the communication methods used. A variety of communication methods must be adopted to ensure all stakeholders are engaged appropriately, such as face to face, email/letters, community meetings and information sessions and website notifications. • Details on the information provided during the community consultation process. Note: A plain English statement explaining the proposal and conceptual drawings must be made available to the community and stakeholders. • A summary of the responses and the main comments raised by the stakeholders and the community. • Evidence must be provided demonstrating that consultation has been undertaken with each relevant group/person including specific detail on how these concerns were addressed.	**Chapter 16.0**

Requirement	Location in EIS
• A description on how any concerns have been considered and identify any changes that have been made to the proposal. Consultation must occur as early as possible and avoid, or make allowances for public holidays, school holidays and the summer holiday (Christmas) shutdown period. The level of engagement must be comparable with the size, location and nature of the development and potential impact on the wider community.	
9.3. Consideration of public representations from Draft EIS notification • The revised EIS must include a consultation report outlining the representations received, issues raised in the representations and a response to the issues and values identified. The summary response must clearly identify the representation(s) to which the responses relate.	**Section 17.5.3**
10. Recommendations	
Provide a summary of any commitments to impact prevention, mitigation measures, offsetting measures and other actions within the EIS. Describe the monitoring parameters, monitoring points, frequency, data interpretation and reporting proposals.	**Chapter 19.0**
11. Other relevant information	
The proponent may wish to include issues outside the scope of the EIS as a separate section of the EIS. This allows the proponent to identify matters not required to be addressed in the EIS, but that would be subject to development assessment consideration and notification. This can provide additional context for members of the public regarding management of environmental issues, by ensuring that the public is aware that these issues will be addressed in the detailed design of the proposal.	-
12. References	
A reference list using standard referencing systems must be included.	References (page 467)
13. Required Appendices	
13.1. Scoping document for the EIS A copy of the scoping document should be included in the EIS. Where it is intended to bind appendices in a separate volume from the main body of the EIS, the scoping document should be bound with the main body of the EIS for ease of cross-referencing.	**Appendix A**
13.2. Scoping Document Reference Include a table that cross-references the EIS to the scoping document. If the EIS addresses the scoping document in multiple places then this must be also referenced.	**Appendix B**
13.3. Proponent's Environmental History Provide details of any proceedings under a Commonwealth or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:	**Appendix D**

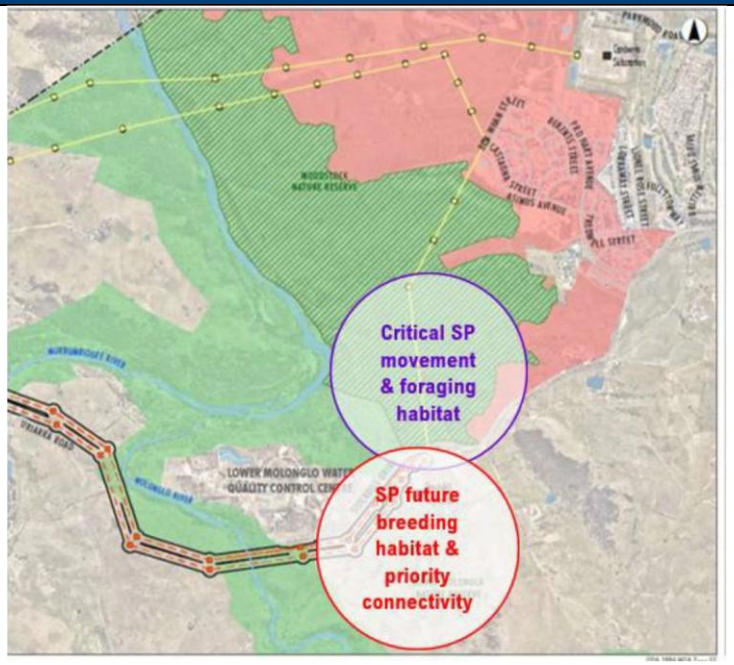
Requirement	Location in EIS
• The person proposing to take the action. • For an action for which a person has applied for a permit, the person making the application. If the person proposing to take the action is a corporation, then provide details of the corporation's environmental policy and planning framework. Enough information is required to satisfy s136(4) of the EPBC Act.	
13.4. Information Sources For information given the following must be stated: • The author or any reports or studies. • The publication date. • The source of the information. • How recent the information is (i.e. when a study was conducted or when primary sources were produced). • How the reliability of the information was tested. • What uncertainties (if any) are in the information.	**Appendix E**
13.5. Study team The qualifications and experience of the study team and specialist sub-consultants and expert reviewers must be provided.	**Appendix F**
13.6. Specialist studies All reports generated based on specialist studies undertaken as part of the EIS are to be included as appendices.	**Appendix G**
13.7. Research Any proposals for researching alternative environmental management strategies or for obtaining any further necessary information should be outlined in an appendix.	-
Entity Requirements	
ACT Emergency Services	
<u>ACT Fire & Rescue (ACTF&R)</u> Bushfire Threat Assessment and Compliance Report: This development is located inside the area declared by the ESA to be subject to the threat of bushfire. Although not essential for this type of development, it is classified as critical infrastructure and the application of appropriate bushfire protection measures (BPM's) are advised. BPM's can be sourced within the CFA document 'Design Guidelines and Model Requirements – Renewable Energy Facilities Version 3	**Chapter 15.0**

Requirement	Location in EIS
– Section 6.2.3 Landscape Screening and On-Site Vegetation, which refers to document 'The Electricity Safety (Electric Line Clearance) Regulations 2020. This Regulation prescribes the vegetation clearance requirements for electric lines based on the assigned fire hazard rating for land established under Section 80 of the *Electricity Safety Act 1998*. Essential Energy Bushfire Risk Management Plan CEOP8022 should also be referenced.	
ACT Rural Fire Services (ACTRFS) Bushfire Protection Requirements: While specific bushfire protection requirements will not be required for this development, ACTRFS requests that when submitting the development application, the proponent considers that any high-risk works, such as hot works, undertaken during the declared bushfire season, be undertaken with an approved fire permit and associated conditions to address bushfire risk. A fire permit to undertake a high-risk activity within the Rural Area can be obtained by contacting ACTRFS via email: rfs@act.gov.au	**Chapter 15.0**
ACT State Emergency Service (SES) Identified Flood Zone {1% AEP}: The proposed site is an area of land that may be inundated by a 1%AEP flood, through the Murrumbidgee River and the Molonglo River running through multiple blocks. ACTSES note that potential flooding may present a public safety risk due to the proximity of public access areas to land that may be subject to flooding. It is recommended that the project risk assessment consider flood risk, and that specific flood risk control measures are detailed in the Emergency Plan for this development. Identified Dam Infrastructure Failure Flood Zone: A portion of the proposed site is in an area that may become inundated should a dam infrastructure failure occur at Googong and Cotter dams. While an incident of this type is rated by the ACT Government as RARE and of MEDIUM risk, it is recommended that the project risk assessment consider this risk and that specific risk control measures are detailed in the Emergency Plan for this development.	**Section 7.4.2**
ACT Health	
The Health Protection Service (HPS) notes that the scoping document should address the potential for creation of inhalable dust particulates and advises that dust suppression strategies be implemented throughout the construction phase.	**Chapter 12.0**
ACT Heritage	
The application for the EIS Scoping document states that a revised CHA will be completed as part of the EIS. The Council supports this, as an updated CHA will ensure that all cultural heritage places or objects within the Proposal Area are identified, and the Proposal is able to avoid impacts in the first instance, and mitigate and manage any impacts that cannot be avoided, including any impacts on areas of Potential Archaeological Deposit (PAD). The following requirements are identified for the EIS: 1. The CHA must be updated as per the EIS Scoping application, and the updated CHA must also:	• **Chapter 8.0** • CHA: **Appendix G4**

Requirement	Location in EIS
a. Be undertaken by a suitably qualified heritage practitioner. b. Include the information as required by the Council's Cultural Heritage Reporting policy available at https://www.environment.act.gov.au/heritage/publications-and-resources. This must include detailed assessment of prevn the inious heritage studies undertaken, as a number of assessments undertaken in and near the footprint have not been considered iitial CHA. c. Include field survey of the revised project footprint, and provide more details on survey. 2. If testing or archaeological excavation is required to assess the heritage significance of the proposed development area, this investigation must be undertaken to inform the EIS. The investigation must include: a. Preparation of an Excavation Permit application by suitability qualified specialists, and including a Research Design and Methodology. b. Where the application relates to Aboriginal places and objects, consultation with RAOs regarding the proposed investigation, its methods and the management of any objects recovered. 3. Following approval of the application under Section 61F of the Heritage Act, completion of the investigation in accordance with the conditions of that approval. If the CHA and any archaeological investigation identifies that proposed works will cause damage to or diminish the significance of heritage places, recommendations must be presented to comply with *Heritage Act 2004* provisions. This must include consideration of alternatives to avoid heritage impacts, and if these alternatives are not reasonably practicable, measures that could be adopted to minimise heritage impacts. A redacted version of the CHA must be prepared, and only the redacted CHA is to be included in any future public notifications for the project. The EIS must redact information on some heritage places and objects, including in attached heritage reports. The Council also notes that, in accordance with *Heritage Act 2004* provisions, approval from the Council will be required where the proposal may diminish the heritage significance of Huntly or damage Aboriginal places and objects; in addition to any planning approvals required. Such approval is sought by making a Statement of Heritage Effect (SHE) application under Section 61G of the *Heritage Act 2004*, which are approved by the Council where it is satisfied on reasonable grounds that: the proposed activity is justifiable; and that there are no other reasonably practicable alternatives to heritage impacts; and that measures to minimise the heritage impacts of the proposal have been adopted.	
The Conservator for Flora and Fauna	
Impacts to flora and fauna 1. The Consequence rating for most of the identified risks to Ecology and Natural Environment appear too low, particularly given the significance of the threatened species and communities impacted. At a minimum most of the scores should be increased to major and the unmitigated risk scores updated to reflect this correction.	**Chapter 5.0** See **Appendix B** for changes made to the Conservator's comments and requirements for the EIS relating to Austral toadflax, superb parrot and

Requirement	Location in EIS
2. According to section 2.5.2 of the report, impacts to the habitats of the Pink-tailed Worm-Lizard (*Aprasia parapulchella*, PTWL) and Superb Parrot (Polytelis swainsonii, SP), and to the critically endangered Box Gum Woodland (BGW) and Natural Temperate Grasslands (NTG) are deemed to be considered 'not significant'. It is unclear how the removal of a minimum of 0.8 ha of PTWL habitat, 1.5 ha of BGW, 0.2ha of NTG and the removal of at least eight potential SP nesting trees is not considered a significant adverse impact. The works will lead to a long-term decrease in the size of an important population of the PTWL and reduce the area of occupancy of an important population of PTWL. The works will also reduce the extent and fragment, or increase fragmentation of, two threatened ecological communities. 3. The EIS should consider the impacts of the development on the following species that have been recorded on the alignment of the proposed and existing powerlines: a. Little Eagle (*Hieraaetus morphnoides*) b. Perunga Grasshopper (*Perunga ochracea*) c. Hoary Sunray (*Leucochrysum albicans*) d. Gang-gang Cockatoo (*Callocephalon fimbriatum*) e. Diamond Firetail (*Stagonopleura guttata*) f. Scarlet Robin (*Petroica boodang*) g. Southern White-face (*Aphelocephala leucopsis*). 4. Areas of groundcover dominated (most abundant species) by either Themeda australis or Microlaena stipoides must be mapped and additional survey for Thesium australis undertaken. 2023 was a poor season for this species in the local region and even large populations could not be found. Therefore, the results of the one-off survey cannot be taken as proof of absence. 5. Each impact area must be clearly mapped, especially around towers sites and access tracks (new and old). Existing towers in McNamara and Strathnairn are located within NTG and PTWL habitat and detailed maps must be available to accurately assess these impacts. 6. Impacts of removal of the existing lines must also be identified and assessed, including impacts to vegetation, especially trees. 7. Impacts on migratory species, including Rainbow Bee-eater (Merops ornatus) must also be considered. 8. Important connectivity pathways must be mapped and the impacts of the proposal on these pathways assessed. 9. Consideration and mitigation of impacts to native burrowing animals must also be included. 10. Superb Parrot (SP)	golden sun moth.

Requirement	Location in EIS
• ACT Government research has shown that there is > 50 % likelihood that a tree is suitable for SP nesting if the tree has the following attributes: o tree species is Eucalyptus rossii or *Eucalyptus blakelyi* o trunk diameter at breast height > 70 cm o >9 tree hollows (with entrance size > 4 cm) are visible from the ground. • If any trees within the impact zone fit these criteria their removal would be classified as significant, given that the transmission line is only 2.5 km from a highly productive SP breeding colony. • Further, it is because SPs have high breeding site fidelity (as Umwelt notes) that opportunities to restore and extend SP breeding habitat are limited to landscapes that contain extant breeding colonies (as this one does). Therefore, piecemeal reduction of this potential habitat area is an important threat to avoid. The EIS must include an assessment of the area circled in red overleaf for trees that meet criteria underlined above and any impacts to any identified suitable trees if avoidance is not possible. • Finally, due to the Parkwood development area, landscape connectivity between the breeding colony and critical SP foraging habitat (circled purple below) through the southern boundary of Woodstock Nature Reserve is important. Research shows that trees 10–15 m in height support SP movement, so their removal should be avoided within the area circled red overleaf. The EIS must include a tree assessment of this area and identification and assessment of any impacts to trees that contribute to SP movement. • It needs to be clearly noted that finding offsets for SP breeding trees is incredibly difficult, so any impacts to these breeding trees should be avoided. Impacts to the species must also be assessed against the ACT Action Plan for this species to determine if any buffers area required around identified habitat. • Cumulative impacts on biodiversity values is also important for SP. The EIS will need to provide an explicit description around cumulative impacts for this species. The risk mitigation measures identified in B1 in the risk are insufficient to address B3, as per the Risk Assessment provided.	

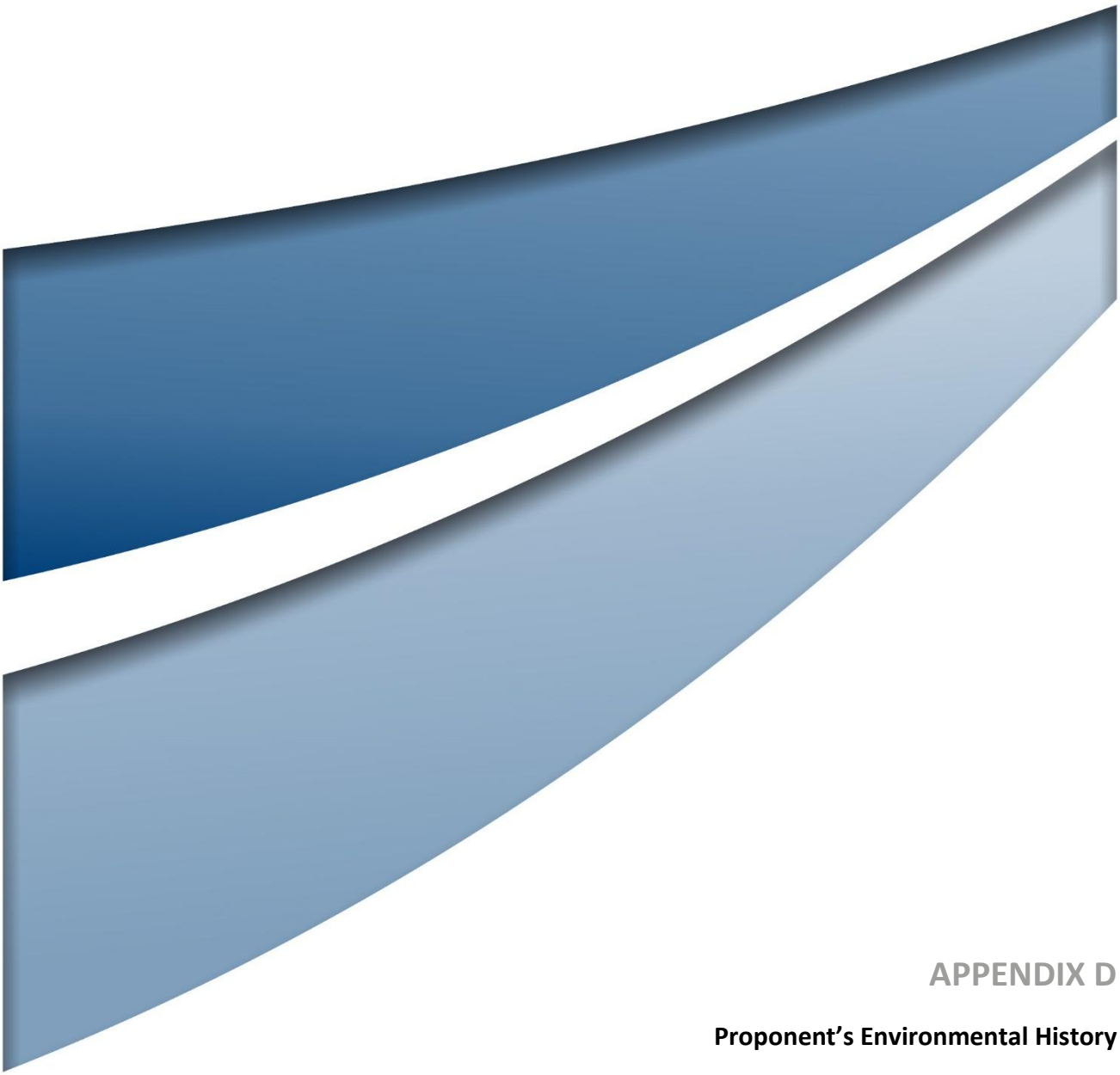
Requirement	Location in EIS
 11. Golden Sun Moth A more robust assessment of significant impact is required for the Golden Sun Moth (*Synemon plana*). Preliminary distribution models for the species that focus on dispersal limited females, indicate that the area may hold moderate to high quality habitat for Golden Sun Moth (based on a combination of abiotic and landscape features identified at good condition sites across the ACT). The comments of the consultants appear to be at odds with the modelling ACT Government have been developing. More rigorous assessment of Golden Sun Moth habitat and population, during suitable survey periods should be included in an assessment of impact.	
<u>Bushfire risk</u> 12. There is precedent for powerline operations to cause fire ignitions, especially on days of elevated fire danger due to hot and windy conditions. The design, specification, construction, and operational procedures all need to consider the risks posed by fire caused by powerlines. 1. The following risks must be considered in the EIS:	• Bushfire risk: **Section 15.3** • Transmission line maintenance: **Section 2.3.4**.

Requirement	Location in EIS
• Risk of bushfire from the operation of the project, including from infrastructure failure or clash of conductors. • Bushfire safety in design. How has the project been designed and specified, and how will the project be maintained, to reduce the risk of failure or other incident causing fire? • Risk to health of firefighters. Please consider the risk of injury/death to firefighters performing fire suppression under or near overhead conductors (including in conditions of thick smoke). • How will the lines be inspected and maintained to reduce the risk of line failure of conductor clash causing a fire?	
<u>General comments</u> 13. Site investigations prior to construction (and ideally during approval process) should include surveys for Matters of National Environmental Significance during appropriate survey periods, relative to the values being surveyed. 14. The EIS will need to make a commitment to regular checking and reporting on compliance measures as well as compliance with PCS and EPSDD best practice standards and immediate rectification of breaches. 15. The proponent must consider impacts from the removal of the existing powerlines. The report currently considers the removal of the existing powerlines as a positive environmental outcome and partly uses it to justify the realignment of the powerlines outside one conservation area and into another that arguably contains more values. This justification is not support by evidence. 16. The original impacts to the environment caused by the construction of the current alignment have already largely occurred. The works involved in the removal of the infrastructure will only contribute further to the whole of life impacts of the current alignment. The proponent must present all realignment options, including keeping the existing alignment or undergrounding the alignment though the future development area. This could be presented in a cost benefit analysis, which considers environmental, heritage, social and financial cost and benefits etc. 17. The EIS should also outline any commitments to the long-term rehabilitation of the decommissioned powerlines.	• Biodiversity impacts and mitigation/management measures, including rehabilitation: **Chapter 5.0** • Proposal alternatives considered: **Section 2.4** • Cost-benefit analysis: **Appendix G8.**
Department of Climate Change, Energy, the Environment and Water	
The department has considered the information and the following comments: • The department understands the proposal area traverses the NSW and ACT border and the Application is for the ACT portion only, as the land in NSW is not subject to the ACT planning framework. The department notes that the NSW portion will be assessed under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and the applicant intends to refer the proposal to the Commonwealth under the *Environment Protection and Biodiversity Act 1999* (EPBC Act) following consideration under the ACT and NSW processes. The department recommends the applicant ensures they are aware of their obligations under the EPBC Act prior to making a referral under the EPBC Act.	Biodiversity impacts: **Chapter 5.0**

Requirement	Location in EIS
• The department notes the Application does not consider potential impacts that may arise from the removal of the existing transmission lines and towers. The department requests that these potential impacts, including temporary impacts, are identified and discussed in the Environmental Impact Statement.	
Icon Water	
1. These works shall require Building Approval from Icon Water, this approval is separate to and additional to, approval of the Environmental Impact Statement. 2. Reference to the risk of induced currents or earth rise potential risks has not been detailed in the submitted documents, please update the documents to include this. The new route appears to cross buried water and/or sewer mains, as a result the safety impact of an electrical fault on the lines to personnel working at Icon Water's nearby Lower Molonglo Water Control Centre (LMWCC) need to be quantified and mitigated if necessary. The safety impact of an electrical fault in relation to buried water and/or sewer pipes needs to be assessed along the entire length of the new transmission line, not just around LMWCC. 3. Please note, Icon Water is aware of work done previously by TransGrid when they constructed the new 330 kV substation near the LMWCC which resulted in some changes to the infrastructure at LMWCC at the time to address the electric shock risk. This work may provide some assistance in fulfilling the above requirements.	EMF and electrical hazards: **Chapter 15.0**
Transport Canberra and City Services	
The EIS scoping document has been reviewed by TCCS and following are comments for consideration: • The proposal spans across TCCS assets including road networks. Appropriate measures and clearance requirements will need to be demonstrated during any Development Application (DA) or post DA process. • Any impacts to existing Trees within road reserves must be discussed with TCCS prior to or during the DA proposal. • Given access would be required from the existing road network including Stockdill Drive, Uriarra Road and Fairlight Road, a traffic management plan will be required during the DA. • A construction management plan will be requested during the DA process to ensure there are no adverse impacts to TCCS assets, public assets or their operation. • Any asset handover to TCCS will need to be discussed with TCCS prior to any DA lodgement for the proposal.	N/A
Utilities Technical Regulation	
1. The Utilities Technical Regulation (UTR) charter under the UTR Act includes: • ensure the safe, reliable, and efficient delivery of regulated utility services	**Chapter 15.0** See **Appendix B** for changes made to the UTR's comments and requirements

Requirement	Location in EIS
• promote the long-term serviceability of regulated utility networks and services • promote design integrity and functionality of regulated utility networks • ensure the safe and reliable operation and maintenance of regulated utility networks. Although the proposed project has only been described as "330 kV Transmission Line Realignment", the project in fact also includes a change of electrical network configuration due to the reconnection of one of the transmission lines to a different TransGrid Substation, and may also include other connection changes within substations. This change can potentially affect the long-term electrical supply capacity available to the ACT under certain contingency event situations, and must therefore be included in the EIS Scoping Document for impact assessment. 2. Accordingly, the following information is required for a loss of substation contingency event: a. For Loss of Canberra substation event, what is the electrical supply capacity immediately available to the ACT i. Before the proposed Line reconfiguration. ii. After the proposed Line reconfiguration. b. For Loss of Stockdill substation event, what is the electrical supply capacity immediately available to the ACT i. Before the proposed Line reconfiguration. ii. After the proposed Line reconfiguration. c. For Loss of Williamsdale substation event, what is the electrical supply capacity immediately available to the ACT i. Before the proposed Line reconfiguration. ii. After the proposed Line reconfiguration. 3. Provide the electrical rating for each of the two relocated lines. 4. The Umwelt project outline report does not include the removal of existing buried earth conductors associated with Towers that will be removed. 5. EMF assessment to be undertaken for Normal & Maximum load conditions, and for Maximum Line rating, for compliance with ARPANSA limits.	for the EIS.

Requirement	Location in EIS
6. Sound level and electrical interference assessment to be undertaken for Corona discharge, and the line designed so that ACT noise level requirements and electrical interference limits are met at edge of easement. Detailed assessment to be undertaken for possible excessive voltages due to Electromagnetic Induction/Low Frequency Induction (EMI/LFI) and Earth Potential Rise (EPR) and associated Step & Touch voltages, on nearby metallic infrastructure such as fences, telecommunication infrastructure, pipelines, streetlight poles due to transferred voltages from the MEN earthing system, etc. Some relevant standards would include AS/NZS 4853, AS EG0 and AS EG1. Mitigation measures to be identified if allowable limits are exceeded. Upon completion of the construction phase, the line commissioning phase should include overall verification of design hazard mitigation for EMI and EPR of nearby metallic infrastructure through low voltage current injection testing as undertaken on other similar projects as this has revealed hazard locations not identified during the design phase.	



APPENDIX D

Proponent's Environmental History

The GJV is a joint venture between the SLA and Riverview Developments (ACT) Pty Limited. The SLA is a statutory authority within the EPSDD that is responsible for urban development in the ACT on behalf of the ACT Government. SLA developments aim to balance social, economic and environmental benefits for all Canberrans through the following (SLA, 2023):

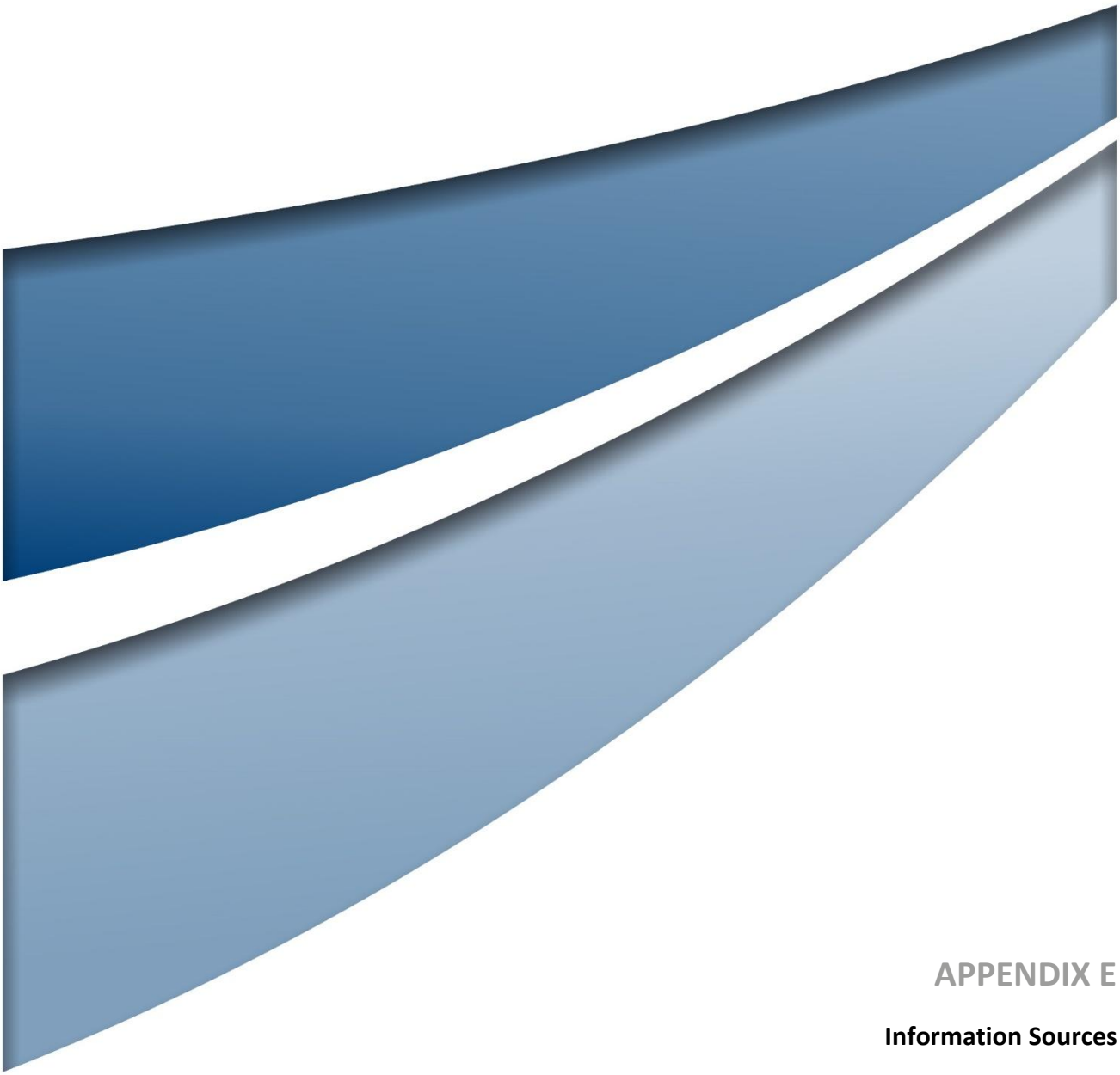
- Affordable living.
- A safe and healthy population.
- Social inclusion and diversity.
- Housing choices.
- Environmental sustainability.

Riverview Group is a subsidiary of Corkhill Bros Pty Ltd. It is a property development company that aims to create "communities of modern commerce and living that are at the forefront of international design and sustainability" (Riverview Group, 2020). Riverview Developments (ACT) Pty Limited (Riverview) acts as the development/project manager for the joint venture.

As the managing agent of the GJV, Riverview's past and future projects have been and will continue to be carried out in accordance with all relevant environmental protection policies and guidelines. The planning, design and construction of their projects have met industry best practice and will continue to operate in this manner. Riverview has a strong history of responsible environmental management and has not been subject to any proceedings under Commonwealth, State or Territory law.

The Ginninderry residential development is subject to the West Belconnen Strategic Assessment approval dated April 2017. For compliance purposes, the GJV prepares annual reports under the EPBC Act all of which have been submitted and endorsed and are publicly available as required by the approval. The first five-year audit report was completed in 2022 and has been endorsed by DCCEEW.

Transgrid would be the owner and operator of the Proposal's assets once they are operational. Transgrid operates and manages the high voltage electricity transmission network in NSW and the ACT. As such, it has a range of standards which regulate how the transmission assets must be maintained over the lifetime. The Proposal will be maintained in accordance with these standards.



APPENDIX E

Information Sources

Table E.1 provides a list of all specialist reports prepared for this EIS including author, publication date and any uncertainties. Information was sourced from reputable databases and desktop information, as described in each report, and verified in many cases through fieldwork. The investigations were undertaken in accordance with Territory and Commonwealth Government legislation, policies, guidelines and standards where available, or from publications by other State or International governments if appropriate. The most up-to-date information has been used in all reports. The authors were selected through a competitive tender process to ensure that appropriately qualified and experienced professionals were engaged for the Proposal.

Table E.2 provides a list of all the information sources that were used and referenced in the BAR, including Commonwealth and State conservation advices, recovery plans and threat abatement plans.

Table E.1 Specialist Reports Prepared for this EIS

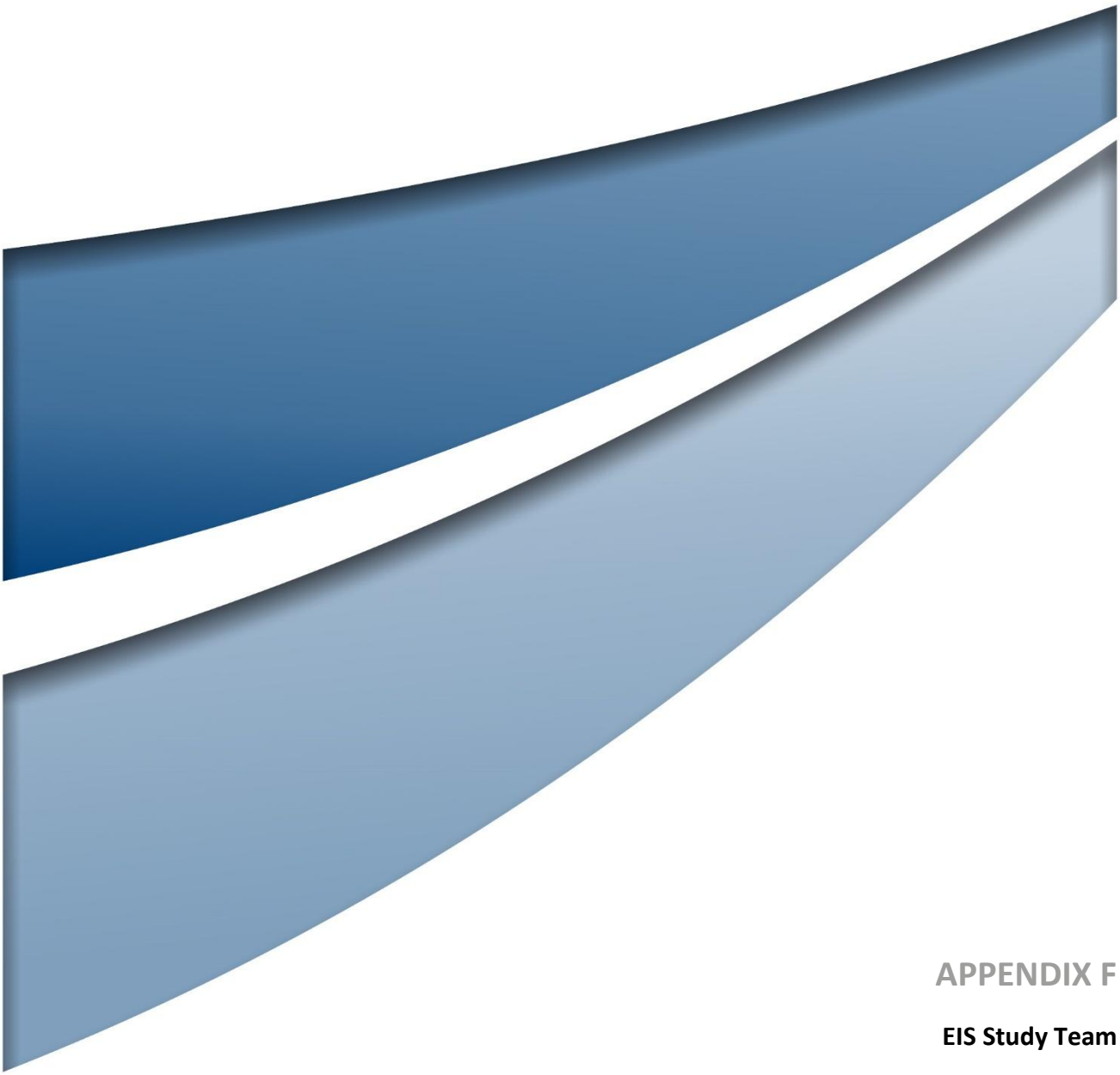
Report	Author	Publication Date	Uncertainties
Biodiversity Assessment Report	Umwelt	17 October 2024	None
Preliminary Site Investigation (Contamination)	Douglas Partners	30 January 2024	The PSI involved a desktop assessment and site walkover, but did not include any intrusive investigations to confirm the presence of potential contamination. Given the large area covered by the Proposal and undeveloped nature of the land, the level of work undertaken is considered appropriate for the EIS. Intrusive investigations will be undertaken as part of the DA process in Blocks 1614, 1602 and 1461 Belconnen, to confirm whether any contamination is present in the Proposal's disturbance area given that fill and PFAS may occur in these areas. If contamination is confirmed, the CEMP will detail the measures to be implemented to manage the contamination during construction to prevent any further soil degradation or contamination of nearby waterbodies.
Preliminary Erosion and Sediment Control Plan	Umwelt	20 December 2023	The preliminary ESCP describes the erosion and sediment control measures that will be implemented for each type of construction activity, including new tower construction, demolition of existing tower, laydown area construction, and access track construction. These control measures are not site specific. A detailed ESCP will be prepared once detailed design has been completed, as part of the CEMP, which outlines the control measures that will be implemented through the entire construction footprint.

Report	Author	Publication Date	Uncertainties
Cultural Heritage Assessment	Past Traces	16 January 2024	Past Traces identified several Aboriginal heritage sites in proximity to the Proposal, which will be avoided by direct impacts. Given that no subsurface testing was undertaken (due to the Proposal being able to avoid impacts on known sites), the risk of subsurface objects being present will be addressed through the implementation of an Unexpected Finds Protocol in the CEMP, which will detail the procedure to be followed in the event that any previously unidentified Aboriginal heritage items (or objects suspected of having heritage value) are identified during construction. This will build upon the Unexpected Discovery Plan provided at Appendix 2 of the CHA (Appendix **G4**).
Landscape and Visual Impact Assessment Report	dsb Landscape Architects	29 January 2024	None.
Noise and Vibration Impact Assessment	Umwelt	7 March 2024	The NVIA was based on assumptions for sound levels of the primary noise sources (construction machinery) operating at maximum capacity. These assumptions will be verified during detailed design once the make and model of the equipment have been selected. The type and nature of any additional mitigation measures will be detailed in the CNVMP.
Traffic Impact Assessment	Egis	2 February 2024	The TIA involved a comparison of indicative Proposal construction vehicle levels against the theoretical vehicle capacity of each road and the anticipated 2026 traffic volumes. Construction vehicle numbers will be verified once detailed design has been completed and integrated into the TMP to identify appropriate mitigation or management measures.
Cost-benefit Analysis	CIE	February 2024	The analysis is based on a range of assumptions including discount rate and value of the costs and benefits of the Proposal. Despite the reliance on assumptions, the approach is consistent with the ACT Government's economic appraisal methodology that forms part of its Capital Framework. Additionally, CIE is a reputable and experienced economic research firm.
Bushfire Assessment Report	ABPP	2 February 2024	None.
Electric and magnetic field (EMF) assessment	CDNP	January 2024	None.

Table E.2 Statutory Documents Referenced in the BAR

Document	Publisher	Publication Date	Reliability	Uncertainties
ACT Native Woodland Conservation Strategy and Action Plans	ACT Government	November 2019	High	None
Nature Conservation Key Threatening Processes List 2019	ACT Government	December 2019	High	None
Nature Conservation (Loss of Mature Native Trees) Conservation Advice 2018	ACT Government	September 2018	High	None
Loss of Mature Native Trees Key Threatening Process – Draft Action Plan	ACT Government	2021	High	None
Approved Conservation Advice for the White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland	TSSC	August 2023	High	None
Nature Conservation (Yellow Box – Blakely's Red Gum Grassy Woodland) Conservation Advice 2020	ACT Scientific Committee	May 2020	High	None
National Recovery Plan for White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Department of Environment, Climate Change and Water NSW	May 2011	High	None. Although this document is more than ten years old, the information it contains is generally considered to still be relevant.
Approved Commonwealth Conservation Advice (including listing advice) for Natural Temperate Grassland of the South Eastern Highlands (EC 152)	DoE	April 2016	High	None
Nature Conservation (Natural Temperate Grassland) Conservation Advice 2020	ACT Scientific Committee	May 2020	High	None
Polytelis swainsonii (Superb Parrot) Conservation Advice	TSSC	May 2016	High	None
National Recovery Plan for the Superb Parrot *Polytelis swainsonii*	DAWE	June 2022	High	None
Conservation Advice for *Callocephalon fimbriatum* (Gang-gang Cockatoo)	DAWE	March 2022	High	None
Conservation advice Painted Honeyeater *Grantiella picta*	DoE	March 2015	High	None
Nature Conservation (Painted Honeyeater) Conservation Advice 2019	ACT Scientific Committee	May 2019	High	None

Document	Publisher	Publication Date	Reliability	Uncertainties
National Recovery Plan for the Painted Honeyeater *Grantiella picta*	DAWE	June 2021	High	None
Conservation Advice for *Melanodryas cucullata cucullata* (hooded robin (southeastern))	DCCEEW	March 2023	High	None
Conservation Advice for *Aphelocephala leucopsis* (southern whiteface)	DCCEEW	March 2023	High	None
Conservation Advice for *Stagonopleura guttata* (diamond firetail)	DCCEEW	March 2023	High	None
Little Eagle (*Hieraaetus morphnoides*) Action Plan No. 35	ACT Government	2013	High	None. Although this document is more than ten years old, the information it contains is generally considered to still be relevant.
Aprasia parapulchella (Pink-tailed Worm-lizard) Conservation Advice	TSSC	October 2015	High	None
Action Plan Pink-tailed Worm-lizard *Aprasia parapulchella*	ACT Government	May 2017	High	None
Synemon plana (Golden Sun Moth) Conservation Advice	DAWE	December 2021	High	None
Perunga Grasshopper (*Perunga ochracea*) Action Plan	ACT Government	2017	High	None
Action Plan for Listed Migratory Species	ACT Government	March 2018	High	None
Conservation Advice *Hirundapus caudacutus* White-throated Needletail	TSSC	July 2019	High	None
Threat abatement plan for competition and land degradation by rabbits	DoEE	September 2016	High	None
Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*)	DoEE	March 2017	High	None
Threat abatement plan for disease in natural ecosystems caused by *Phytophthora cinnamomi*	DoEE	February 2019	High	None
Threat abatement plan for the biological effects, including lethal toxic ingestion, caused by cane toads	DSEWPC	2011	High	None. Although this document is more than ten years old, the information it contains is generally considered to still be relevant.



APPENDIX F

EIS Study Team

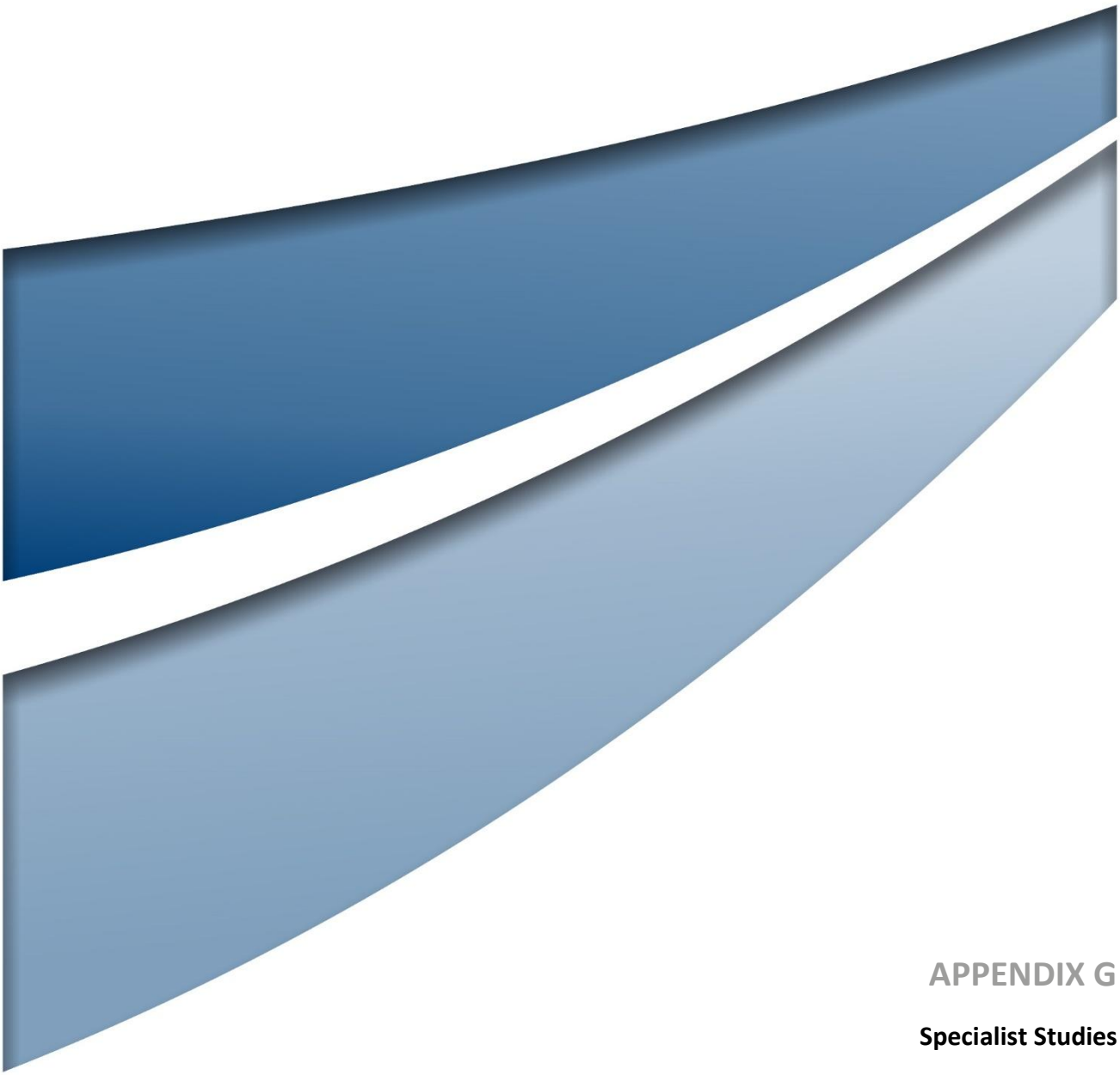
Table F.1 provides the credentials of the Umwelt team members that prepared this EIS and the specialists that prepared each of the supporting technical reports.

Table F.1 Credentials of the EIS Study Team

Name and Company	Role	Qualifications	Years of Experience
EIS			
Karina Carwardine Umwelt, Principal Environmental Consultant	Project Director Technical reviewer	Bachelor of Marine Biology Certified Environmental Practitioner / Impact Assessment Specialist	18
Alexander Garrett Umwelt, Senior Environmental Consultant	Project Manager for Revised EIS Author and reviewer	Bachelor of Environmental Science Certified Environmental Practitioner	8
Natasha Buckingham Umwelt, Senior Environmental Consultant	Revised EIS Author and Reviewer	Bachelor of Science (Soil Science) (Hons)	8
Keira Banks Umwelt, Senior Environmental Consultant (no longer at Umwelt)	Project Manager for Draft EIS Author and primary reviewer	Master of Environmental Management (Water Resources) Bachelor of Engineering (Renewable Energy) (Honours) Bachelor of Science (Environmental and Water Sciences)	9
Caitlin Adcock Umwelt, Principal Environmental Planner	Author and technical reviewer	Bachelor of Town Planning (Honours) Bachelor of Law Planning Institute of Australia Registered Planner	13
Kelly Steele Umwelt, Senior Environmental Consultant (no longer at Umwelt)	Author	Bachelor of Science (Resource and Environmental Management) Bachelor of Arts (Environmental Studies)	5
Samantha Sorley Umwelt, Environmental Consultant	Author	Bachelor of Environmental Science (Land Management)	10+
Travis Williamson Umwelt, Senior GIS Consultant	Spatial analyst and GIS specialist	Bachelor of Applied Geographic Information Systems	6
Biodiversity Assessment Report			
Clare McInnes Umwelt, Principal Ecologist	Lead ecologist Technical reviewer	Graduate Certificate (Business) Bachelor of Science (Honours) Bachelor Applied Science (Natural Resource Management)	20+
David Moore Umwelt, Principal Ecologist (no longer at Umwelt)	Lead ecologist – Draft EIS Technical reviewer – Draft EIS	Master of Environmental Management and Development Bachelor of Science (Honours) Accredited BAM Assessor Certified Environmental Practitioner	12

Name and Company	Role	Qualifications	Years of Experience
Beth Noël Umwelt, Principal Ecologist (no longer at Umwelt)	Field ecologist – Draft EIS Technical reviewer – Draft EIS	Master of Wildlife Management Bachelor of Applied Science (Geology) (Honours) Certificate IV in Management and Team Leadership Advanced Plant Identification UNSW short course Accredited BAM Assessor	20+
Sharae Hurley Umwelt, Ecologist	Primary author	Bachelor of Environmental Science (Applied Ecology, Water Science, Integrated Environmental Management and Sustainable Landscapes)	2
Ray Turnbull Umwelt, Ecologist	Field ecologist Author	Bachelor of Natural Resources Graduate Certificate of Ornithology Graduate Diploma of Ornithology	15
Sarah Hart Umwelt, Senior Ecologist (no longer at Umwelt)	Field ecologist – Draft EIS	Master of Science (Ecology and Zoology) Bachelor of Science (Zoology Graduate Diploma of Environmental Management Accredited BAM Assessor.	10
Preliminary Site Investigation (Contamination)			
Shannon Goodsell Douglas Partners, Environmental Scientist	Fieldwork lead Primary author	Bachelor of Environmental Science	7
Dean Woods Douglas Partners, Principal	Technical reviewer	Certified Environmental Practitioner in Site Contamination Chartered Environmental Engineer Bachelor of Environmental Engineering (Honours)	20+
Erosion and Sediment Control Plan			
Melissa Swan Umwelt, Senior Environmental Engineer	Primary author	Certified Professional in Erosion and Sediment Control Bachelor of Engineering (Environmental) (Honours)	11
Cultural Heritage Assessment			
Lyn O'Brien Past Traces, Principal Archaeologist	Lead archaeologist Technical reviewer	Bachelor of Arts (Australian Prehistory) (Honours)	30+
Nat Cracknell Past Traces, Archaeologist	Field archaeologist Primary author	Master of Arts (Archaeological and Evolutionary Science) Bachelor of Arts (History) (Honours)	4

Name and Company	Role	Qualifications	Years of Experience
Landscape and Visual Impact Assessment			
Michael Reeves dsb Landscape Architects, Director	Landscape architect Primary author	Graduate Diploma (Landscape Architecture) Graduate Certificate (Environmental Law) Registered Landscape Architect #486 Member Australian Institute of Landscape Architects Bachelor of Applied Science Built Environment	40+
Noise and Vibration Impact Assessment			
Tim Procter Umwelt, Lead Process and Environmental Engineer	Technical reviewer	Bachelor of Engineering (Chemical) (Honours)	35+
Ben Carlyle Umwelt, Principal Acoustician	Lead Acoustician	Bachelor of Science (Biology and Geoscience)	18
Amanda Buckeridge Umwelt, Senior Acoustician	Acoustician Primary author	Bachelor of Environmental Science	16
Traffic Impact Assessment			
Nicholas Holmes Egis, Project Engineer – Transport	Lead traffic engineer Technical reviewer	Road Safety Auditor (Level 1) Bachelor of Engineering (Honours)	6
Mark Ma Egis, Graduate Engineer - Transport	Traffic engineer Primary author	Master of Advanced Engineering (Transport)	1
Cost-benefit Analysis			
Hayden Fisher CIE, Director	Lead analyst Author	Bachelor of Economics (Honours)	25+
Laura Cassar CIE, Associate Director	Analyst Author	Master of Economics Bachelor of Resource Economics	18
Bushfire Assessment			
Graham Swain Australian Bushfire Protection Planners, Managing Director	Bushfire Specialist Primary Author	Architectural Drafting Certificate Licensed Builder/Project Manager Various qualifications from the Australizzzan Fire Protection Association, NSW Rural Fire Service, Victorian Country Fire Authority and other agencies	30+
EMF Assessment			
Toby Roxburgh Carbon Neutral Delivery Partners, Managing Director	Lead engineer Primary author	Bachelor of Engineering (Electrical and Control Engineering) (Honours)	20+



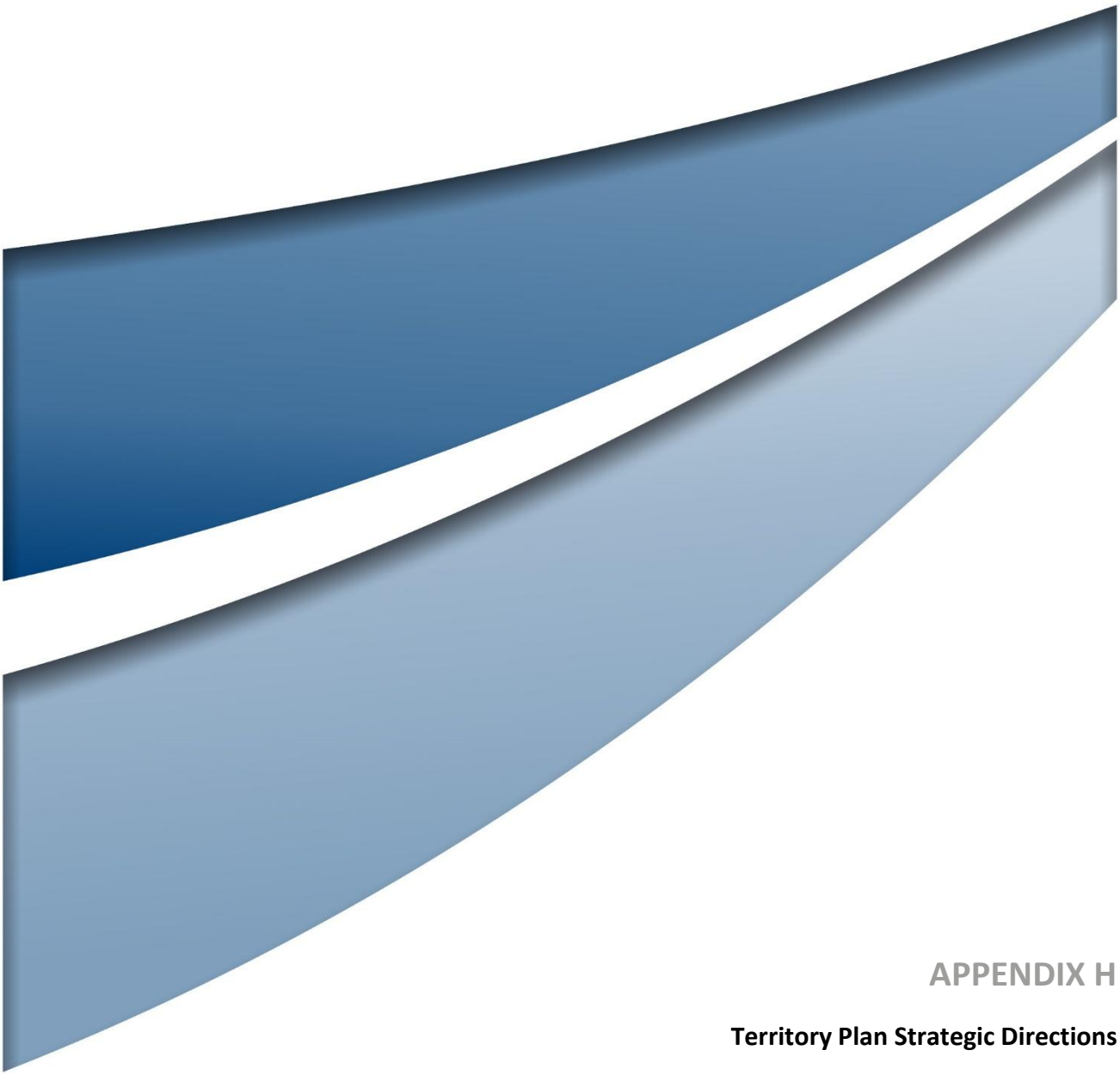
APPENDIX G

Specialist Studies

Table G.1 provides a list of all the specialist reports prepared for this EIS. The reports are attached to this appendix in the order shown in **Table G.1**.

Table G.1 Specialist Report Index

Appendix no.	Report name
G1	Upper and Lower Tumut 330 kV Transmission Line Realignment Biodiversity Assessment Report (Umwelt, 2024a)
G2	Report on Preliminary Site Investigation (Contamination) (Douglas Partners, 2024)
G3	Upper and Lower Tumut 330 kV Transmission Line Realignment Erosion and Sediment Control Plan (Umwelt, 2023)
G4	TransGrid Transmission Line Removal and Relocation, Molonglo West Belconnen – Cultural Heritage Assessment (Past Traces, 2024)
G5	Landscape and Visual Impact Assessment Report (dsb Landscape Architects, 2024)
G6	Upper and Lower Tumut 330 kV Transmission Line Realignment Noise and Vibration Impact Assessment (Umwelt, 2024b)
G7	Traffic Impact Assessment – Stage 1A – Strathnairn Transmission Line Realignment Project (Egis, 2024)
G8	Upper and Lower Tumut 330 kV transmission line relocation cost-benefit analysis (CIE, 2024)
G9	Bushfire Assessment Report for the Upper and Lower Tumut 330 kV transmission line project (ABPP, 2024)
G10	Electric and magnetic field (EMF) assessment – Transgrid transmission lines 1,7 relocation (CNDP, 2024)



APPENDIX H

Territory Plan Strategic Directions

Table H.1 provides a full list of the *Territory Plan 2008* strategic directions and cross-references to sections of this EIS in which the applicable strategic directions have been addressed.

Table H.1 Territory Plan Strategic Directions (Section 2.1 of the *Territory Plan 2008*)

Strategic direction		Location in EIS
1. Principles for Sustainable Development		
General Principles		
1.1	Planning processes and decisions will be focused on the combined achievement of economic vitality, community wellbeing, and environmental quality. Broad community involvement will be a key element in the pursuit of sustainable development, as will complementary regional strategies and agreements.	**Section 3.3**
1.2	Matters of broader National Capital, metropolitan and regional significance will be carefully considered when formulating Territory Plan policies and when making decisions about development proposals and sequencing.	
1.3	Economic, social and environmental objectives will be pursued in a balanced and integrated way, having regard to both short-term and long-term factors, such that present needs can be met without prejudicing the welfare of future generations, and without serious or irreversible loss of life-supporting natural resources or damage to the environment.	
1.4	Wherever appropriate, the broader global and regional context and potential cumulative impacts of decisions will be taken into account. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for failing to prevent environmental degradation.	
Environmental Sustainability		
1.5	Planning policies will seek to ensure the efficient use of all resources and to reduce consumption of non-renewable resources. Waste minimisation, reuse and recycling would be encouraged, whilst energy-rating and conservation measures would be applied wherever appropriate, particularly in transport, subdivision planning, and building design and construction.	**Chapter 13.0**
1.6	The pattern of development is to reflect land capability constraints resulting from topography, soils, geotechnical factors, drainage, natural hazards, microclimate and the sensitivity of ecosystems. Particular attention would be given to the need to conserve soil, water and vegetation; maintain biological diversity; safeguard important ecosystems and ecological processes; and provide and protect wildlife corridors.	• Biodiversity: **Chapter 5.0** • Soils: **Chapter 6.0** • Water: **Chapter 7.0**.
1.7	Land and water resources will be planned in accordance with the principles of integrated catchment management and water sensitive urban design. Policies will seek to protect identified environmental values, whilst focusing on opportunities for multi-purpose use of resources. Special attention is to be given to protecting sources of the Territory's water supply and to maintaining environmental flows in rivers and streams.	**Chapter 7.0**

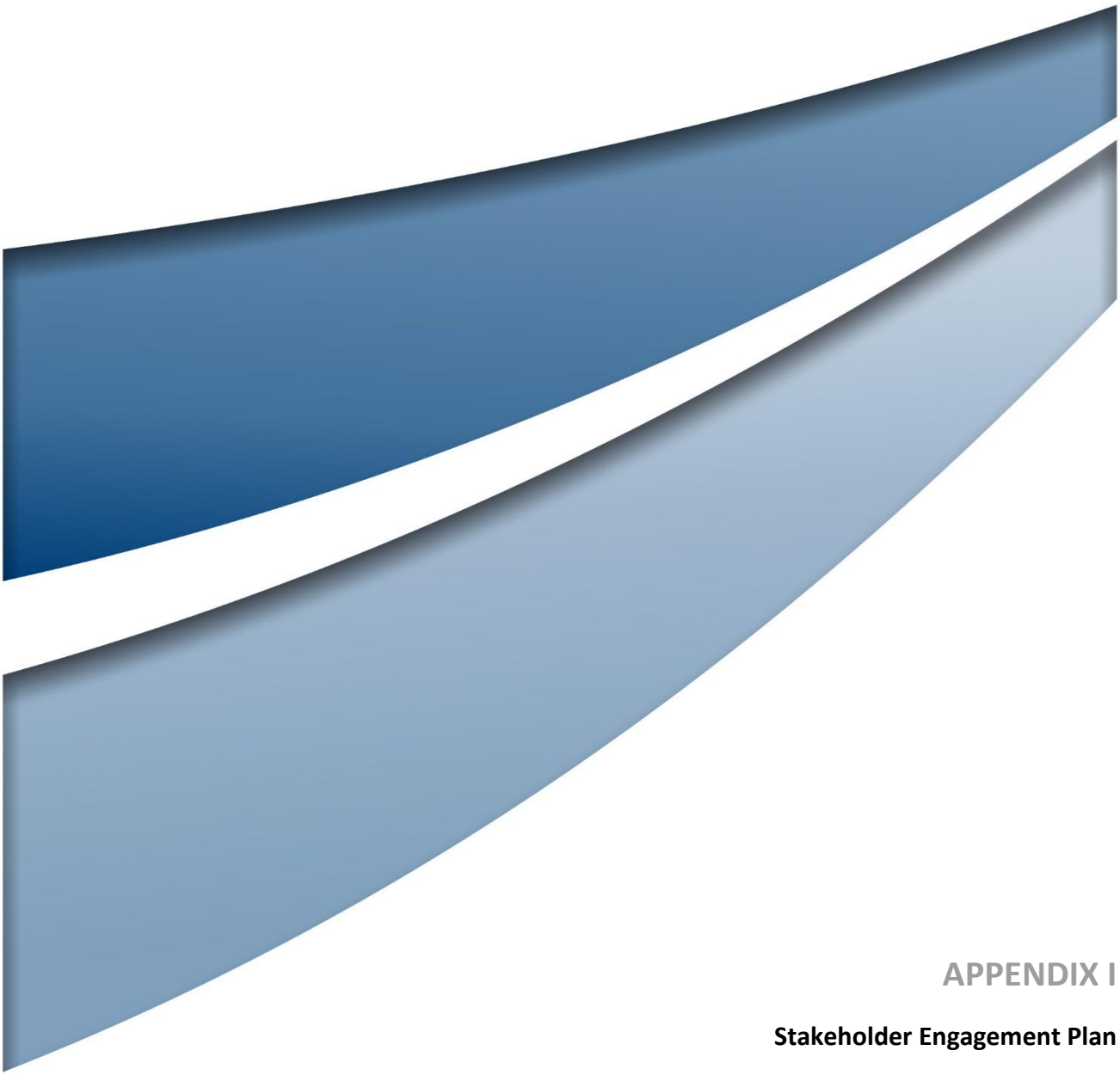
Strategic direction		Location in EIS
1.8	Planning policies will provide for the sustainable management of rural areas, ensuring that rural lands nominated for future urban development or other purposes can be retained in productive use and properly managed for the time being. Appropriate activities to reduce net greenhouse gas emissions will be encouraged.	• Land use: **Section 2.2.3** • Greenhouse gas emissions: **Chapter 12.0**.
1.9	Urban expansion will be contained in order to minimise impacts on valuable natural and rural areas.	Not applicable
1.10	Integrated land use and transport planning will seek to maximise accessibility and transport efficiency, prioritise active travel, reduce energy consumption, increase physical activity, support the preferred pattern of development, promote safety, safeguard environmental quality, and minimise greenhouse gas emissions.	**Chapter 11.0**
1.11	Policies for environmental planning and management would ensure amenity, minimise pollution, and protect public health and safety.	• Visual amenity: **Chapter 9.0** • Noise and vibration: **Chapter 10.0** • Air quality: **Chapter 12.0** • Waste management: **Chapter 13.0** • Hazard and risk: **Chapter 15.0**.
Economic Sustainability		
1.12	Planning policies will facilitate the widest possible range of commercial, retail, industrial, rural, tourism, and other forms of economic activity in order to promote new investment and a more diversified economy, to underpin employment growth, and to respond to changing economic opportunities.	Not applicable
1.13	The characteristics of the city that contribute to economic growth: Canberra's role as the national capital and the seat of Federal Parliament; the ease of getting around the city; the safe and clean environment; and the vibrancy of centres as places of social, cultural and business exchange, will be enhanced.	Not applicable
1.14	An adequate and diverse supply of industrial land will be maintained to facilitate both conventional and new forms of industry.	Not applicable
1.15	Tourism would be fostered by permitting a variety of entertainment, leisure and accommodation facilities, including opportunities for ecotourism, in appropriate locations throughout the Territory.	Not applicable
1.16	Sufficient land would be set aside for major communications, educational, scientific, or other activities requiring broadacre sites in appropriate locations outside urban areas.	Not applicable

Strategic direction		Location in EIS
1.17	In planning future development and redevelopment, particular emphasis will be placed on cost-effective provision and management of existing and new infrastructure and services, taking into account whole-of-life and whole-of system costs, including the ecological footprint of proposed developments and activities.	• ESD: **Section 3.3** • Cost-benefit analysis: **Appendix G8.**
Social Sustainability		
1.18	Provision will be made for a comprehensive range of readily accessible community, cultural, sporting and recreational facilities, distributed accordingly to the varying needs of different localities and population groups. In major centres and developing areas, sites will be safeguarded where necessary for particular community needs.	Not applicable
1.18A	Development is planned to promote active living through the following six principles: (a) providing connectivity between uses and activity nodes (b) preserving open space (c) encouraging mixed land use and density (d) ensuring public places are safe and attractive for all (e) providing supportive infrastructure that encourages regular physical activity (f) ensuring environments promote social inclusion, and are equitable and where practicable are accessible by all.	Not applicable
1.19	A variety of open space types will be provided in each district or local area to meet diverse recreational needs of residents and visitors, and to contribute to community health.	Not applicable
1.20	Planning policies for community facilities and open space will encourage multiple use and flexible design to allow for changing needs.	Not applicable
1.21	Provision of affordable, adaptable and special-needs housing will be promoted throughout the city, as well as modification or redevelopment of existing stock to meet emerging social needs.	Not applicable
1.22	Urban development will be planned in a manner that promotes community vitality and safety, applying principles of crime prevention through environmental design. Provision will also be made for emergency services infrastructure necessary to ensure a high standard of safety for residents and visitors.	Not applicable
1.23	The needs of people with disabilities will be recognised in all facets of urban planning, particularly including the design and operation of transport and access systems and the assessment of development proposals.	Not applicable
1.24	All new developments and re-developments will be planned with appropriate and segregated network facilities for pedestrians and cyclists; provision for accessible public transport; a legible and permeable hierarchy of roads; conveniently located commercial and community facilities; and a network of open spaces.	Not applicable

Strategic direction		Location in EIS
1.25	Heritage and cultural values will be safeguarded, including in particular those of the Territory's Aboriginal peoples and those derived from both its rural history and urban development as the National Capital. The distinctive qualities of residential areas and other places, as well as elements of community heritage, will also be recognised and their conservation promoted.	**Chapter 8.0**
1.26	Identified places of cultural heritage significance will be protected in accordance with requirements for their conservation contained in the Heritage Register and any relevant heritage guidelines under the *Heritage Act 2004*. Special provisions are included in the Heritage Act for recognition, registration and conservation of Aboriginal heritage.	**Chapter 8.0**
2. Spatial Planning and Urban Design Principles		
Urban Areas		
2.1	Canberra will continue to develop a series of discrete urban areas within a landscape setting of hills, ridges and other open spaces. Each town will offer a diversity of housing types; the broadest possible range of employment opportunities; and convenient, linked access to prioritising active travel to centres and community facilities and open space.	Not applicable
2.2	Future residential settlement will be accommodated through development of greenfield areas, subject to detailed feasibility and suitability studies; some expansion of existing towns; and appropriate use of suitable vacant or underdeveloped spaces.	Not applicable
2.3	Commercial and retail activity will be concentrated in centres and other planned nodes of intensive activity that are well served by public transport to ensure an efficient pattern of development. Primary emphasis will be placed on strengthening and enhancing existing and new centres and nodes, including improved urban design and encouragement of more mixed-use development.	Not applicable
2.4	Planning policies will support revitalisation of the City Centre as the preeminent centre of governance, commerce and entertainment for the ACT and its region, while keeping the City Centre in appropriate balance with other town centres. Within the City Centre, provision will also be made for a range of major community facilities and opportunities for high-density residential development.	Not applicable
2.5	A wide range of housing types will be permitted in identified residential areas close to centres and major transport routes to increase choice; maximise opportunities for affordable housing; and secure some intensification of development consistent with maintaining residential amenity. Outside of these areas, planning policies will protect the typically low density, garden city character of Canberra's suburban areas.	Not applicable
2.6	Higher density development will be encouraged within and near major centres, and in other suitable locations that are well served by public transport.	Not applicable
2.6A Development will provide suitable and well-designed supportive infrastructure that enhances the experience of the urban environment for people of all abilities and encourages and supports regular physical activity.		Not applicable

Strategic direction		Location in EIS
2.7	Development will be planned to encourage use of public transport, walking and cycling, including commuter cycling. Routes will be reserved for an enhanced inter-town public transport system. Requirements for vehicle parking will be related to commercial needs and transport policy objectives.	Not applicable
2.8	Industrial areas will be in locations accessible to suitable freight services, and where industrial activity is unlikely to have a significant adverse effect on the environment or the amenity of residential areas.	Not applicable
2.9	A planned hierarchy of roads will be maintained in order to promote road safety, protect the amenity of residential and commercial areas, and facilitate the efficient movement of major traffic flows and heavy vehicles.	Not applicable
2.10	Adequate provision of open space throughout the Territory will remain a high priority. Open space will be planned and carefully maintained as an integrated, hierarchical system that provides for a diversity of sport and recreation activities, contributes to the legibility and character of urban development, is cost-effective to maintain, and assists in the effective management of stormwater.	Not applicable
Non-urban Areas		
2.11	Planning policies will protect the landscape and environmental qualities of the hills and ridges surrounding urban areas, the Murrumbidgee and other river corridors, the mountains and forests west of the Murrumbidgee River, and productive rural landscapes.	**Section 2.2.3**
2.12	Planning for non-urban and natural areas will also recognise the values of land for research, education, recreation and tourism purposes.	**Section 2.2.3**
2.13	Clearance zones will be established where necessary around major facilities to protect the operational efficiency of those facilities and to minimise adverse environmental impacts.	**Chapter 15.0**
Urban Design		
2.14	Policies and procedures to promote high quality, creative design of development, urban spaces and landscape settings will be applied throughout the Territory, and innovation encouraged, in keeping with the spirit of the National Capital as an exemplar of best practice. Particular care will be taken to ensure high-amenity, quality design outcomes within residential areas, heritage areas, major centres and activity nodes, and along principal approach routes. The relationship between the public and private realms will also be emphasised in terms of the design quality of precincts and shared spaces, including spaces around buildings, as well as that of individual developments.	Not applicable

Strategic direction		Location in EIS
2.15	Policies will acknowledge Canberra as the national capital and the symbolic heart of Australia and will seek to preserve the landscape features that give the national capital its character and setting; respect and reinforce the key elements of Walter Burley Griffin's formally adopted plan for Canberra within the proposed urban settlement pattern; enhance and strengthen approaches and backdrops to the city and its national institutions; conserve open space between urban areas as visual separation buffers consistent with the landscape setting; retain areas that are identified as the rural setting surrounding the city; and retain key vistas created by the landscape network within new settlement areas.	Not applicable
2.16	Retention of Canberra's unique landscape setting, including the integration of natural and cultural elements that create its 'garden city' and 'bush capital' qualities, will be accorded the highest priority. Special attention will be given to safeguarding visual amenity, protecting vegetation and other important features within the established urban landscape, and ensuring the high quality of environmental design in new developments or redevelopment.	Not applicable
2.17	Advertisements and signs will be carefully controlled to maintain environmental amenity.	Not applicable



APPENDIX I

Stakeholder Engagement Plan

Stakeholder Engagement Plan

Transmission Line 1 + 7 relocation and Transmission Line 3C Stringing

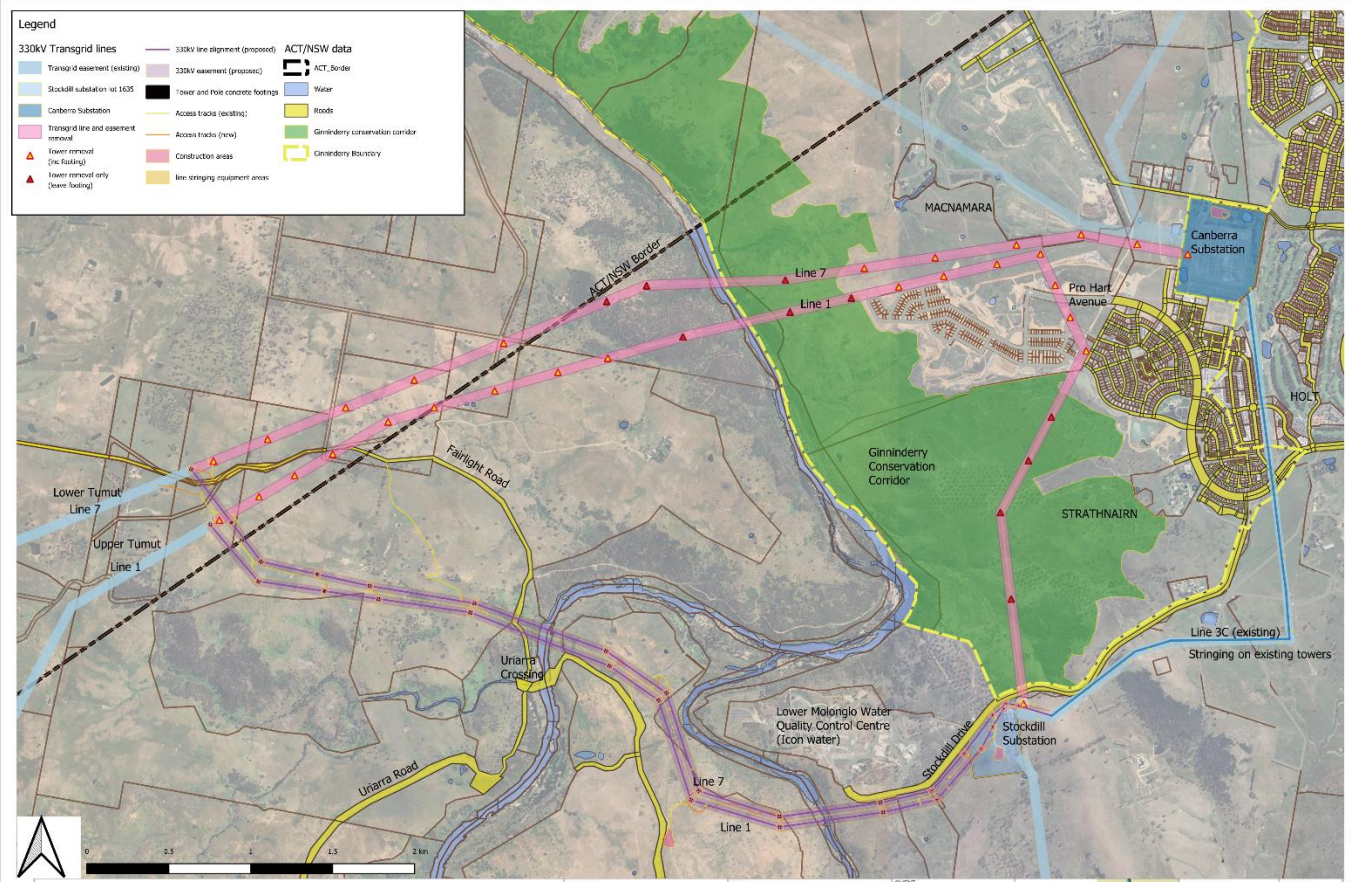
November 2024

The Proposal

This Stakeholder Engagement Plan relates to the proposed Upper and Lower Tumut 330 kilovolt (kV) transmission line realignment, which involves relocating part of the Upper Tumut (Line 1) and Lower Tumut (Line 7) transmission lines near their point of connection in the Australian Capital Territory (ACT) and stringing the Lower Tumut Line (Line 3C) as it passes by Stockdill Substation towards Canberra Substation.

The new alignments would divert from near the ACT/NSW border and extend southeast, crossing the Molonglo and Murrumbidgee Rivers in the ACT and then connecting to existing towers at the Stockdill Substation on Stockdill Drive in western Belconnen, ACT (see Figure 1 below). The new alignments traverse a combined distance of approximately 11.3 kilometres (km).

Figure 1 - Drawing showing the relocation of Line 1 into Stockdill substation and relocation of Line 7, which becomes 3C additional string after it passes by Stockdill substation and connects into the same location at Canberra Substation.



The Proposal also involves the decommissioning and removal of part of the Upper and Lower Tumut transmission lines shown in pink in Figure 1. The Lower Tumut transmission line currently runs through Macnamara and connects to the Canberra Substation in Strathnairn, while the Upper Tumut transmission line diverts south to connect to the Stockdill Substation. The sections to be removed traverse a combined distance of approximately 12.3 km.

The Proposal also involves the stringing of Line 3C, which includes three additional 330 kV cables installed on the existing transmission towers. This is referred to as the "stringing of additional conductors". Line 3C runs between the Canberra and Stockdill Substations along the edge of the suburb of Holt. The additional conductors would be a continuation of the new Lower Tumut transmission line as it runs past the Stockdill Substation and then continues to the Canberra Substation.

This engagement plan outlines the methodology being adopted by the Ginninderry Joint Venture to brief stakeholders and the wider community on the proposed works, and to seek feedback on possible alternatives and improvements to be considered as part of the Environmental Impact Statement and Development Application processes for the works.

Benefits and Issues

Benefits

As shown in Figure 1, the current transmission line alignment passes through future urban areas of Ginninderry and through a significant distance of the Ginninderry Conservation Corridor.

- Relocation of Transmission Lines out of the Ginninderry urban footprint will:
    - Improve biodiversity values from reduced impacts in conservation areas (including the Ginninderry Conservation Corridor) through additional funding for conservation activities.
    - Improved neighbourhood amenity by removing Transmission Lines from the urban area and surrounds (noise and visual amenity increases)
    - Unlocks potential housing supply - approximately 430 additional dwellings in appropriately zoned land
    - Increase the housing supply for low-to-moderate income households, with approximately 15% of the 430 dwellings earmarked for social, community and lower-cost housing.
    - Uplift in land value for future and current land owners within Ginninderry.
    - Reduced visual impact for current and future Ginninderry residents.
    - Perceived benefit of reduced EMF (electric and magnetic fields) for Ginninderry residents, despite guidelines indicating current easements are safe.
    - Provide a communitywide net benefit of $70 million over the project's 50-year life.
- Greater length of Transmission lines within buffer zone area of the Lower Molonglo Water Quality Control Centre. Colocation of infrastructure provides for more efficient land use.
- Location of new transmission towers have been placed to avoid cultural heritage locations and sensitive environmental areas.
- Restringing Line 3C uses existing transmission towers. This reduces the need for new towers, hence reducing additional visual impact.

Potential Issues

- General national press against transmission lines, particularly in Victoria, due to a lack of consultation with affected landowners. Mitigated by extensive research into alternatives, including undergrounding (not viable), using existing Transmission Towers (stringing only) and informative community consultation.
- Neighbouring landowners unhappy with transmission lines close to their property. This will be mitigated by informative, targeted community consultation sessions and ongoing meetings in addition to the thorough consultation undertaken to-date.
- Visual impact at some locations (such as Uriarra Crossing) is increased. This will be mitigated by early consultation with relevant interest groups and users to highlight its low impact.

- Impacts on golf course operations during stringing of Line 3C (possible hole closure required) will be mitigated by ensuring string pulling equipment is located outside golf course land, early consultation, and open communication with the Golf Course Owners.
- Additional noise (perceived or real) from a cable strung on the existing easement and tower near Ginninderra Estate. This is mitigated by conducting a noise study that shows minimal additional noise from added cable.
- Construction traffic impacts the local road network, mainly in relation to potential oversize, overmass transport vehicles. This is mitigated by access from Southern Cross Drive/Parkwood Drive (rather than Pro Hart Avenue). There is minimal additional impact compared to surrounding construction works.
- Ecological impacts. mitigated through design and extensive multiyear environmental and heritage surveys to identify (and avoid) high value areas.

Objective of the Engagement

Key objective:

- A widely engaged community that feels informed about the proposal.

Capital Region Engagement:

- Inform the broader community (including users of Uriarra Road and Crossing) of the proposal, and obtain feedback that is able to be considered and addressed (if needed) in the draft EIS.

Surrounding landowners:

- Inform surrounding landowners (particularly within Ginninderra Estate) of the proposal and obtain feedback that is able to be considered and addressed (if needed) in the draft EIS.
- Provide comfort that the works do not include another Transmission Tower (just restringing) and that noise studies suggest only minimal additional noise impact.
- Provide the Golf Club owners and operators with information around program timing to ensure they are aware of any impact on golf course users. Facilitate conversations between the golf course and Transgrid regarding any public safety requirements or impacts through construction.

Ginninderry Residents:

- Inform Ginninderry residents of the proposal, and obtain feedback that is able to be considered and addressed (if needed) in the draft EIS.
- Ensure residents are fully briefed on what to expect during construction, including any additional traffic issues, the de-stringing process, and the removal of the transmission towers.
- Ensure that programs are communicated along with any expected delays that may arise.

Stakeholders

1. **Host and neighbour landholders and land managers**
2. **Transgrid/Lumea**
3. **Evoenergy**
4. **Burns Club golf course (both management and operators)**
5. **Icon Water**
6. **Telstra**
7. **Local ACT Public** might include
   - Residents of Macnamara and Strathnairn suburbs
   - Residents close to Ginninderry development (including Ginninderra Estate)
   - Walkers, bird watchers, users of nature trails and national parks
   - People working, residing or using an area within a 3km noise radius
8. **Local NSW Public** might include
   - Residents travelling into ACT through Uriarra crossing
   - Residents close to Ginninderry

- Adjoining landowners
- Walkers, bird watchers, users of nature trails and national parks

9. **Government Agencies**
   - ACT Government agencies including
     - Environment Protection and Sustainable Development Directorate (EPSDD)
     - Suburban Land Agency
     - Transport Canberra and City Services (TCCS)
     - Parks and Conservation
     - Conservator of Flora and Fauna
     - Utilities Technical Regulator (UTR)
   - Australian Department of Climate Change, Energy, the Environment and Water (DCCEEW)
10. **Minister for Housing and Suburban Development (Minister Berry)**
11. **Special interest groups,** such as
    - Strathnairn Arts Centre
    - Ginninderry Conservation Trust
    - Bush on the Boundary
12. **Ginninderry project and conservation teams.**

Figure 2 – Stakeholder engagement. For additional information, see the engagement record in Appendix A.

	Level of Influence	Level of Interest	Engagement Approach	Engagement Tactic
Landholders, leaseholders and land managers	High	High	Consult.	Ginninderry.com/projects Letterbox drop; Information Session; One-on-One Meetings; Meeting Minutes
Transgrid/Lumea	High	High	Consult.	Meetings via Lumea project manager Carol
Evoenergy	Low	Medium	Consult.	Meetings via Evoenergy Ginninderry contacts
Burns Club golf course	Medium	High	Consult.	Ginninderry.com/projects Information Session; One-on-One Meetings; Meeting Minutes
Icon water	Medium	Medium	Inform.	Ginninderry.com/projects Information Session; One-on-One Meetings
Telstra	Low	Low	Inform.	Ginninderry.com/projects Information Session; One-on-One Meetings
Local ACT Public	Low	High	Consult.	Ginninderry.com/projects Letterbox drop; Information Session;
Local NSW Public	Low	Medium	Consult.	Ginninderry.com/projects Letterbox drop; Information Session;
Government agencies	High	Medium-High	Inform.	Ginninderry.com/projects Information Session; One-on-One Meetings; SLA led meetings

	Level of Influence	Level of Interest	Engagement Approach	Engagement Tactic
Ginninderry Residents	Low	High	Consult.	Ginninderry.com/projects Community Drop-In Session at The Link; Community Newsletter; Ginninderry Locals Facebook Group
Minister Berry	High	Low	Inform.	Email; Minister Berry Update;
Special Interest Groups	Medium	Medium	Inform; Consult.	Ginninderry.com/projects; Information Session or dedicated meeting (as appropriate).
Ginninderry project and conservation teams	Low	Medium	Inform	Email; Team Meeting.

Communication Approach

Engagement Mechanisms

- Development Projects on Ginninderry.com
- Surrounding Residents to Ginninderry (including Ginninderra estate)
    - Letterbox drop
    - Project Information Session (Wednesday 20 November at The Link, 4pm-7pm)
- NSW surrounding residents
    - Project Information session (Thursday 21 September at Uriarra Crossing, 4:30-6pm)
- Ginninderry Residents
    - Invitation
        - Email
        - 'Ginninderry Locals' Facebook Group
        - Letterbox drop
    - Engagement
        - Community Drop-In Session
    - Community information sessions feedback to be documented via a Listening Report (Appendix B), with the findings shared by:
        - Community Newsletter
        - Email
        - 'Ginninderry Locals' Facebook Group
- History of engagement – see attached engagement sheet in Appendix A

FAQs

- What is changing?
  - Two Transmission Lines (Lines 1 and Lines 7 being the Upper and Lower Tumut Lines) that currently run through Ginninderry are proposed to be moved, as per the drawings and visual impact report.
  - A second line will be strung on Line 3C towers running from Stockdill Substation to Canberra Substation (across Pro Hart Avenue), as per the drawings and visual impact report.
- Why is Ginninderry moving the transmission lines?
  - Release more land for development for a growing Capital Region, including affordable housing.
  - Transmission lines are currently located in key conservation areas – the project would move the transmission lines out of the Ginninderry Conservation Corridor to improve conservation outcomes.
  - Reduce visual impact for Ginninderry residents, visitors and neighbouring property owners.
- Why is the project being proposed now?
  - Ginninderry has been talking with Transgrid (the owner of the transmission lines) and with the Government about the opportunities to relocate transmission lines from within Ginninderry since 2014.
  - The current transmission lines run along the northern edge of the Macnamara which is currently under construction. By removing the lines, Ginninderry can provide approximately an additional 430 homes to the market – increasing much-needed housing supply to the ACT.
- When will the new transmission lines be operational?
  - Subject to environmental and planning approvals, construction timelines and feasibility, the current estimate is late 2028.
- Will there be any planned power outages during construction?
  - No. The new lines will be constructed first, and power will be transferred to them before the old lines are removed.
- Who is seeking to move the Transmission lines?
  - The Ginninderry Joint Venture, which is being delivered by a joint venture comprising Suburban Land Agency (SLA), acting as agent for the Australian Capital Territory, and Riverview Developments (ACT) Pty Ltd. Riverview Projects (ACT) Pty Ltd is the development manager for the Ginninderry Joint Venture (GJV).
- Who is funding the relocation?
  - The Ginninderry Joint Venture will be funding the relocation works.
- Does the ACT Government support the application?
  - The ACT Government has approved the project proceeding to the Development Application stage. The ACT Government agencies have been consulted, and feedback has been incorporated into project proposal. They will also provide feedback as part of the standard Environmental Impact Assessment process and then the Development Application process. ACT government agencies see the overall benefits of the project.

Action Plan

Stakeholder	Engagement Tactic/s	Timing
ACT Residents (inc. Ginninderry)	Invitation – Community Consultation Session	by 6/11/24
	Information Session	20/11/24
	Listening Report	28/11/24
	Further consultation	As needed
NSW Residents	Invitation – Community Consultation Session	by 6/11/24
	Information Session	21/11/24
	Listening Report	28/11/24
	Further consultation	As needed
Landholders and land managers	Direct meetings; Invitation – Community Consultation Sessions	Ongoing 6/11/24
Representative Aboriginal Organisations (RAOs)	Engaged under Heritage ACT 2004 - Heritage consultant engagement and consultation, feeding back into route planning, reduced impacts	through Heritage assessments and EIS process
Utilities (Transgrid/Lumea, ICON, Telstra etc)	Direct meetings; Invitation – Community Consultation Sessions	As needed 6/11/24
Burns Club Golf Course	Direct meeting; Invitation – Community Consultation Sessions	w/c 28/10/24
ACT Agencies	Direct meetings; Email update; Invitation – Community Consultation Session	As needed w/c 4/11/24 6/11/24
Special Interest Groups	Dedicated meetings: BoB CSDRG Ginninderry Conservation Trust Bicentennial National Trail Meeting minutes	 20/11/24 out of session w/c 4/11/2024 ongoing w/c 4/11/24 1 week following mtg
Minister Berry	Fortnightly updates.	Ongoing fortnightly
Project Team	Share this SEP with relevant Project Team members	Once approved

Approvals

Toby Roxburgh		24/10/2024
Project Lead	**Signature**	**Date**
Jessica Stewart		24/10/2024
Engagement Lead	**Signature**	**Date**
Stephen Harding		24/10/2024
Project Director	**Signature**	**Date**

Appendix A: Consultation Record

6/11/24	Rural landowner letterbox drop completed
6/11/24 – 8/11/24	Ginninderry Residents letterbox drop conducted by resident
7/11/24 – 8/11/24	Ginninderra Estate and Golf Course Estate letterbox drop conducted by Jess S
6/11/24	Facebook – Ginninderry Locals page update posted
6/11/24	Ginninderry website updated to include Projects and Initiatives page https://ginninderry.com/project/proposed-transmission-line-relocation/ Including feedback form and community consultation dates
13/11/2024	National Trail/ Pony Club (surrounding landowners)– direct email via Imogen Featherston informing of community consultation session
13/11/2024	CSG and Landfill Representatives (surrounding landowners)– direct email via Gareth Burdon informing of community consultation session
13/11/2024	ICON (surrounding landowners) – direct email via Steve Harding informing of community consultation session
22/11/2024	EPSDD – direct email to George Cilliers confirming indicative development timeline
20/11/2024	Bush on the Boundary Meeting – presentation by Matt Frawley. 7 people attended. Minutes recorded by Ginninderra Catchment Group
20/11/2024	Community Drop-in Session – The Link, ACT 19 people attended. Key questions recorded by Umwelt Environmental Consultants.
21/11/2024	Community Drop-in Session – Uriarra, NSW 5 people attended. Key questions recorded by Umwelt Environmental Consultants.

Appendix B: Examples of Letterbox Drop and Proposal Website

Ginninderry

The Link – Community and Information Centre
1 McClymont Way, Strathnairn ACT 2615
PO Box 484, Kippax ACT 2615
T. 1800 316 900

6 November 2024

Community Drop-in Sessions: Proposed Transmission Line Realignment

Dear Resident,

The Ginninderry Joint Venture is exploring options to relocate two 330kV transmission (power) lines from within the Ginninderry development footprint.

The proposal would involve relocating part of the Upper Tumut (Line 1) and Lower Tumut (Line 7) transmission lines which currently pass through Macnamara and Strathnairn, moving them south of the Icon Lower Molonglo Water Quality Control Centre and connecting into the Stockdill Substation on Stockdill Drive. The proposal would also include a stringing of an extension line (Line 3C) which would run on existing towers between Stockdill Substation and Canberra Substation. This is shown in Figure 1 below.

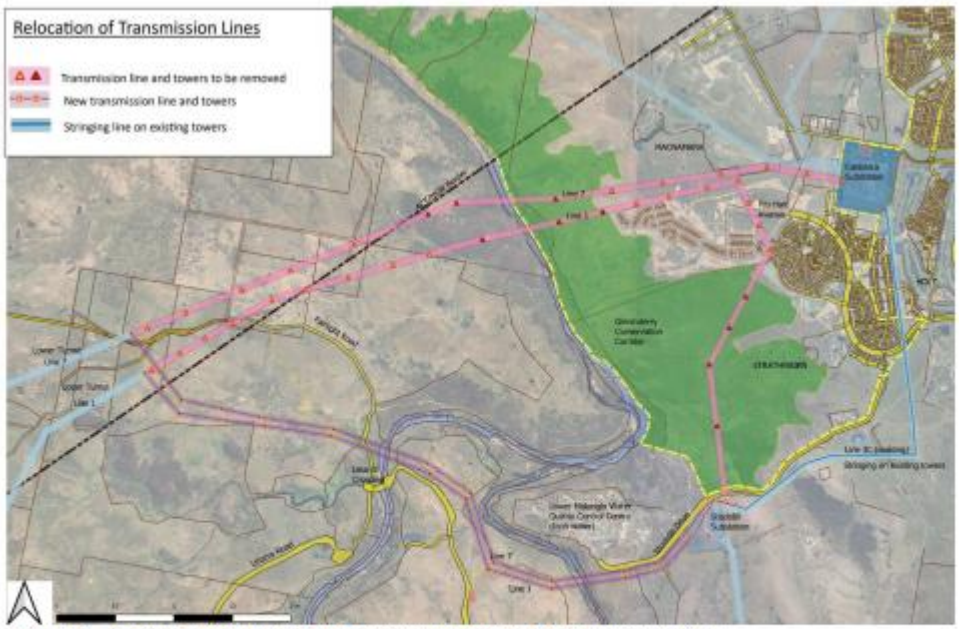


Figure 1 – indicative map showing the proposed relocation of transmission lines.

ACT Government | Suburban Land Agency | RIVERVIEW GROUP

The current transmission lines pass through future urban areas of Ginninderry and through a significant distance of the Ginninderry Conservation Corridor. The relocation of the lines would avoid cultural heritage locations and sensitive environmental areas. It would also unlock land for future housing supply and will reduce the overall visual impact on the landscape.

Proposed Timeline (subject to consultation and approvals)

Community Consultation:	November 2024 and ongoing
Environmental Approvals:	December 2024 – December 2025
Development Approvals:	December 2025 – Late 2026

Subject to Business Case and Government approvals, construction and demolition works could then commence in late 2026 with completion of the project currently estimated to be in late 2028.

Community Drop-in Sessions

Ginninderry will be holding a series of consultation sessions with the broader community, prior to submitting the proposal for environmental and development approvals. We would like to hear your feedback and to answer any questions via two drop-in sessions in November as outlined below:

20 November 2024	**21 November 2024**
4:00 – 7:00 pm	4:30 – 6:00 pm
The Link – Community and Information Centre	Swamp Creek, Uriarra Crossing, Coree, ACT
1 McClymont Way, Strathnairn, ACT	(At the corner of Uriarra Rd & Fairlight Rd)

If you would like further information in the meantime, please visit Ginninderry.com/TransmissionLines or email me via the details below.

Regards,

Jessica Stewart
Head of Sustainability and Community Development
community@ginninderry.com

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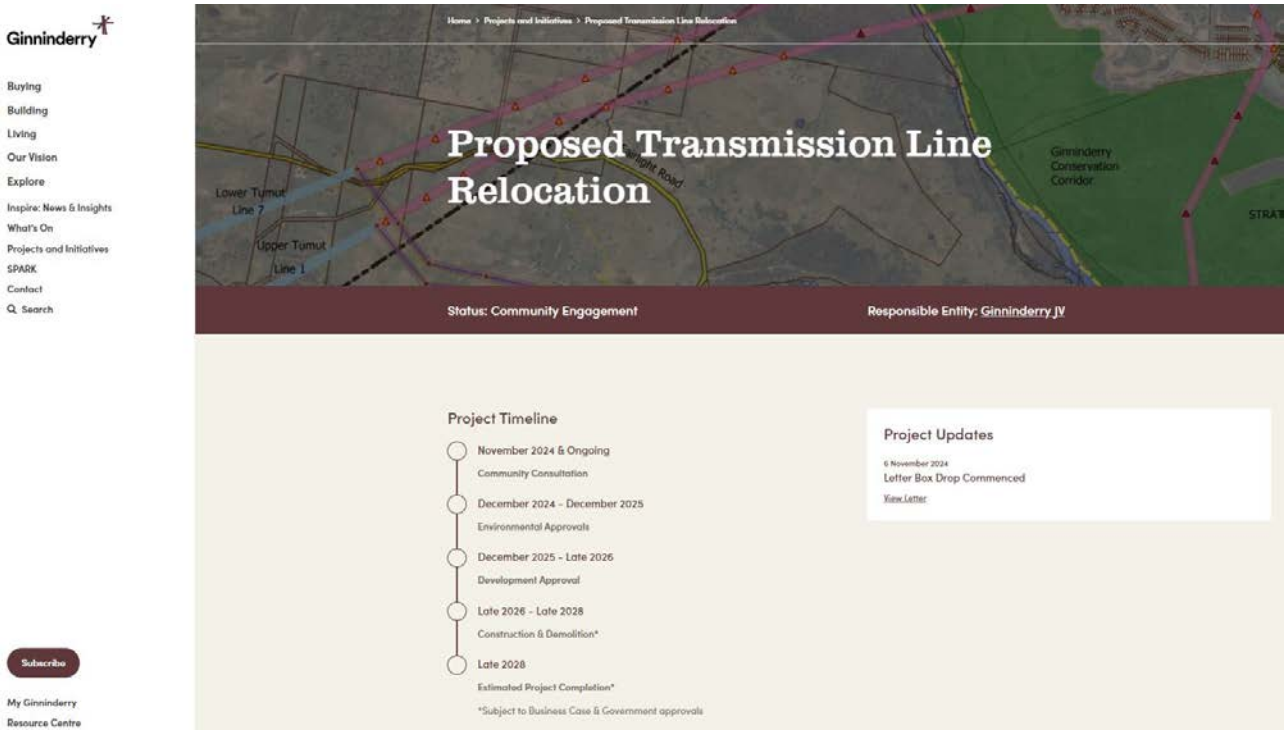
ginninderry.com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Proposed Transmission Line Relocation
Lower Tumut Line 7
Upper Tumut Line 1
Ginninderry Conservation Corridor
Status: Community Engagement
Responsible Entity: Ginninderry JV
Project Timeline
November 2024 & Ongoing
Community Consultation
December 2024 – December 2025
Environmental Approvals
December 2025 – Late 2026
Development Approval
Late 2026 – Late 2028
Construction & Demolition*
Late 2028
Estimated Project Completion*
*Subject to Business Case & Government approvals
Project Updates
6 November 2024
Letter Box Drop Commenced
View Letter

APPENDIX J

Gang-Gang Cockatoo Tree Use Survey

umwelt
Environmental & Social
Consultants

Umwelt (Australia) Pty Limited

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