Transgrid

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Submissions Report

Snowy 2.0 Transmission Connection Project

(March 2022)

Executive Summary

Project background

In 2020, Snowy Hydro Limited (Snowy Hydro) obtained approval to expand the existing Snowy Mountains Hydro-electric Scheme (Snowy Scheme) by linking the existing Tantangara and Talbingo reservoirs through a series of underground tunnels and constructing a new underground hydro-electric power station (referred to as 'Snowy 2.0'). Snowy 2.0 is expected to increase the generation capacity of the Snowy Scheme by almost 50 percent (%), providing an additional 2,000 megawatts (MW) of generating capacity, and making approximately 350,000 megawatt hours (MWh) of large-scale storage available to the National Electricity Market (NEM).

To connect Snowy 2.0 to the NEM, a new transmission connection is required. New South Wales (NSW) Electricity Networks Operations Pty Ltd, as a trustee for NSW Electricity Operations Trust (known as Transgrid), is seeking approval under Part 5, Division 5.2 of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act) for the construction and operation of the Snowy 2.0 Transmission Connection Project (the project) to enable the grid connection of Snowy 2.0 to the NEM.

The project has been declared critical State significant infrastructure (CSSI) under clause 9 of Schedule 5 of the *State Environmental Planning Policy (State and Regional Development) 2011* as part of the CSSI declaration for the 'Snowy 2.0 and Transmission Project' made by order under the EP&A Act dated 7 March 2018.

An Environmental Impact Statement (EIS) for the project was prepared to address the Secretary's Environmental Assessment Requirements (SEARs). The EIS was exhibited by the Department of Planning and Environment (DPE) (formerly the Department of Planning Industry and Environment (DPIE) for 42 days, between 23 February 2021 and 5 April 2021. Public exhibition of the EIS provided the community, interested parties and key stakeholders (including government agencies and councils) with an understanding of the project and the opportunity to make a submission on the EIS.

Consultation activities carried out during exhibition of the EIS included a number of EIS briefings to key stakeholders including government agencies and organisations, together with community information sessions to provide community members an opportunity to discuss the EIS with the project team. The EIS was available to view and download from the DPE Major Projects website (www.planningportal.nsw.gov.au/major-projects).

Purpose of this Submissions Report

This Submissions Report documents, considers and responds to the issues raised in all the community, government agency and organisations submissions received by DPE during public exhibition of the EIS, in accordance with section 5.17(6)(a) of the EP&A Act.

This Submissions Report also describes the actions that have been carried out since the public exhibition period, including further stakeholder consultation, identification of project amendments and further assessment of impacts, and provides an updated justification for the project.

This Submissions Report has been prepared having regard to DPE's *State Significant Infrastructure Guidelines*, dated July 2021, and in particular **Appendix C**, relating to the preparation of a submissions report.

Overview of submissions

DPE received 40 submissions on the project, including 24 submissions from individual community members, six submissions from organisations, and comments from 10 government agencies. Of the 40 submissions, 65% opposed the project and 35% provided advice/comments.

The issue type and key issue category for which most submissions provided comment or objection were:

- The project. Submissions requesting an underground connection to reduce the project's environmental impact, particularly for biodiversity and visual aspects
- Economic, environmental, and social impacts of the project (project impacts). Comments were raised in relation to adverse impacts on the following key issue categories:
  - Biodiversity including the ecological values of Kosciuszko National Park (KNP)
  - Impacts on natural and cultural heritage values of KNP
  - Visual amenity from vegetation clearing and the presence of new transmission infrastructure.
- Procedural matters. Environmental assessment and approvals process in line with statutory requirements.

Actions taken since exhibition of the EIS

Ongoing consultation with stakeholders

Following exhibition of the EIS, the consultation activities have focused on addressing the key issues raised in the submissions. As such direct consultation and engagement activities have been carried out since exhibition of the EIS with a range of stakeholders including relevant government agencies, Snowy Valleys Council, Snowy Hydro and Aboriginal stakeholders. This consultation has informed Transgrid's response to issues outlined in this Submissions Report.

Should the project be approved, Transgrid and its appointed contractor will continue to consult with community members, government agencies and other stakeholders during the pre-construction, construction and commissioning phases.

Project amendments

Since exhibition of the EIS, Transgrid has considered the issues raised in the submissions and identified amendments to the project as presented in the EIS. These amendments provide functional improvements to the design, confirm elements of the project that were highlighted as opportunities in the EIS and take into account ongoing development of the construction methodology.

The *Snowy 2.0 Connection Project Amendment Report* (Transgrid, 2021a) (Amendment Report) has been prepared following the exhibition of the EIS to document the design and construction changes to the project, project clarifications, and additional environmental assessment (biodiversity and Aboriginal heritage) carried out following exhibition of the EIS and updated mitigation measures. The project including the amendments described in the Amendment Report is referred to herein as the 'amended project'.

This Submissions Report should be read in conjunction with the Amendment Report.

Further options assessment

Since exhibition of the EIS, and in response to submissions referring to alternatives and options for the project, Transgrid commissioned a comprehensive review and further analysis of the options included in the EIS as well as other potentially feasible options raised in submissions and in consultation with DPE and National Parks and Wildlife Service (NPWS). This options assessment and analysis is documented in the *Transmission Connection Project for Snowy 2.0 - Options Report* (EMM, 2021) (Options Report).

The Options Report confirms and reinforces the initial EIS options assessment work and clearly demonstrates that an overhead transmission connection, substation and cut-in to Transgrid's existing Line 64, is the preferred option as it is the optimal solution which balances technical feasibility, cost, and environmental impacts. This was the preferred option assessed in the EIS.

Further assessment of the impacts of the amended project

The majority of the impacts associated with the amended project are expected to be generally consistent with those presented in the EIS. Where the amended project was anticipated to have new or varied environmental impacts, these have been assessed, including impacts to biodiversity, Aboriginal heritage, water, transport, visual impacts, and noise, refer to the Amendment Report.

A revised Biodiversity Development Assessment Report (BDAR), Addendum - Aboriginal Cultural Heritage Assessment Report (AACHAR) and Supplementary landscape and visual impact assessment (Supplementary LCVIA) have been prepared in response to agency submissions, and also assess the amended project.

Next steps

The EIS, this Submissions Report and the Amendment Report will be submitted for determination by the Minister for Planning and Public Spaces.

The Minister for Planning and Public Spaces will subsequently decide whether to grant approval, or to refuse the proposal, under Section 5.19 of the EP&A Act.

A copy of the Submissions Report and Amendment Report will be made publicly available on the DPE Major Projects website. The NSW Minister for Planning and Public Spaces determination, including the conditions of approval (CoA) and the Secretary of DPE's Environmental Assessment Report, would be also published on the DPE Major Projects website (www.planningportal.nsw.gov.au/major-projects) following determination.

If the project is approved, it is expected that construction would commence in quarter four 2022.

Contents

List of figures

List of tables

List of photos

Glossary of terms and abbreviations

Acronym	Definition
AACHAR	Addendum Aboriginal Cultural Heritage Assessment Report
ACHAR	Aboriginal Cultural Heritage Assessment Report
ACT	Australian Capital Territory
AEMO	Australian Energy Market Operator
AHIMS	Aboriginal Heritage Information Management System
APZ	Asset protection zone
ATZ	Asset track zone
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BCS	Biodiversity Conservation and Science within the Environment, Energy and Science Group (EESG) within Department of Planning and Environment (DPE).
BDAR	Biodiversity Development Assessment Report
BMP	Biodiversity Management Plan
BOS	Biodiversity Offsets Strategy
CEMP	Construction Environmental Management Plan
CHMP	Cultural Heritage Management Plan -
CSSI	Critical State Significant Infrastructure
CTMP	Construction Traffic Management Plan
DAWE	Department of Agriculture, Water and the Environment
DBH	Diameter at breast height
DEE	Department of Environment and Energy (now DAWE)
DPE	Department of Planning and Environment (formerly Department of Planning, Industry and Environment (DPIE))
DPI	Department of Primary Industries
DPIE	Department of Planning, Industry and Environment (now DPE)
ECZ	Easement clearing zone
EESG	Environment, Energy and Science Group of the DPE
EIS	Environmental Impact Statement
EMS	Environmental Management System
EPA	NSW Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ESCP	Erosion and sediment control plan
ESD	Ecologically sustainable development
FCNSW	Forestry Corporation of NSW
GIS	Geographic Information Systems

Acronym	Definition
HDD	Horizontal directional drilling
HNSW	Heritage NSW
HTZ	Hazard tree zone
IPART	Independent Pricing and Regulatory Tribunal
ISP	Integrated System Plan 2020
KFH	Key fish habitat
KNP	Kosciuszko National Park
KNP PoM	Kosciuszko National Park Plan of Management
LCVIA	Landscape Character and Visual Impact Assessment
LGA	Local Government Area
LTSS	Lower Tumut switching station
MEG	Regional NSW – Mining, Exploration and Geoscience
MNES	Matter of National Environmental Significance
MOU	Memorandum of Understanding
MVA	Megavolt amperes
M^3	Cubic metres
NCC	Nature Conservation Council
NEM	National Electricity Market
NOA	Naturally occurring asbestos
NPA	Natural Parks Association NSW
NPW Act	*National Parks and Wildlife Act 1974*
NPWS	National Parks and Wildlife Service
NRAR	Natural Resources Access Regulator (NSW)
NSW	New South Wales
PAD	Potential archaeological deposit
PCT	Plant Community Type
RFS	Rural Fire Service (NSW)
SAA	Seen Area Analysis
SEARS	Secretary's Environmental Assessment Requirements
Snowy 2.0	The expansion of the existing Snowy Mountains Hydro-electric Scheme (Snowy Scheme) by linking the existing Tantangara and Talbingo reservoirs through a series of underground tunnels and constructing a new underground hydro-electric power station.
Snowy 2.0 BOS	*Snowy 2.0 Main Works Revised Biodiversity Offset Strategy* (EMM, 2020)
Snowy Hydro	Snowy Hydro Limited
SSI	State Significant Infrastructure

Acronym	Definition
SWMP	Soil and Water Management Plan
TARP	Trigger Action Response Plan
TECs	Threatened ecological communities
TPZ	Tension and pulling zone
TSZ	Transmission structure zone
UTSS	Upper Tumut switching station
VNI	Victoria to NSW Interconnector
VCR	Vegetation clearance requirements
WQO	Water quality objectives
ZVI	Zones of Visual Influence

1. Introduction

This section provides an overview of the Snowy 2.0 Transmission Connection Project (the project) as described in the *Snowy 2.0 Transmission Connection Project - Environmental Impact Statement* (Transgrid, 2021) (EIS) and a summary of the assessment that has been carried out to date.

1.1. Background

In 2020, Snowy Hydro Limited (Snowy Hydro) obtained approval to expand the existing Snowy Mountains Hydro-electric Scheme (Snowy Scheme) by linking the existing Tantangara and Talbingo reservoirs through a series of underground tunnels and constructing a new underground hydro-electric power station (referred to as 'Snowy 2.0'). Snowy 2.0 is expected to increase the generation capacity of the Snowy Scheme by almost 50 percent (%), providing an additional 2,000 megawatts (MW) of generating capacity, and making approximately 350,000 megawatt hours (MWh) of large scale storage available to the National Electricity Market (NEM).

To connect Snowy 2.0 to the NEM, a new transmission connection is required. New South Wales (NSW) Electricity Networks Operations Pty Ltd, as a trustee for NSW Electricity Operations Trust (known as Transgrid), is seeking approval under Part 5, Division 5.2 of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act) for the construction and operation of the project to enable the grid connection of Snowy 2.0 to the NEM.

1.2. Key elements of the exhibited project

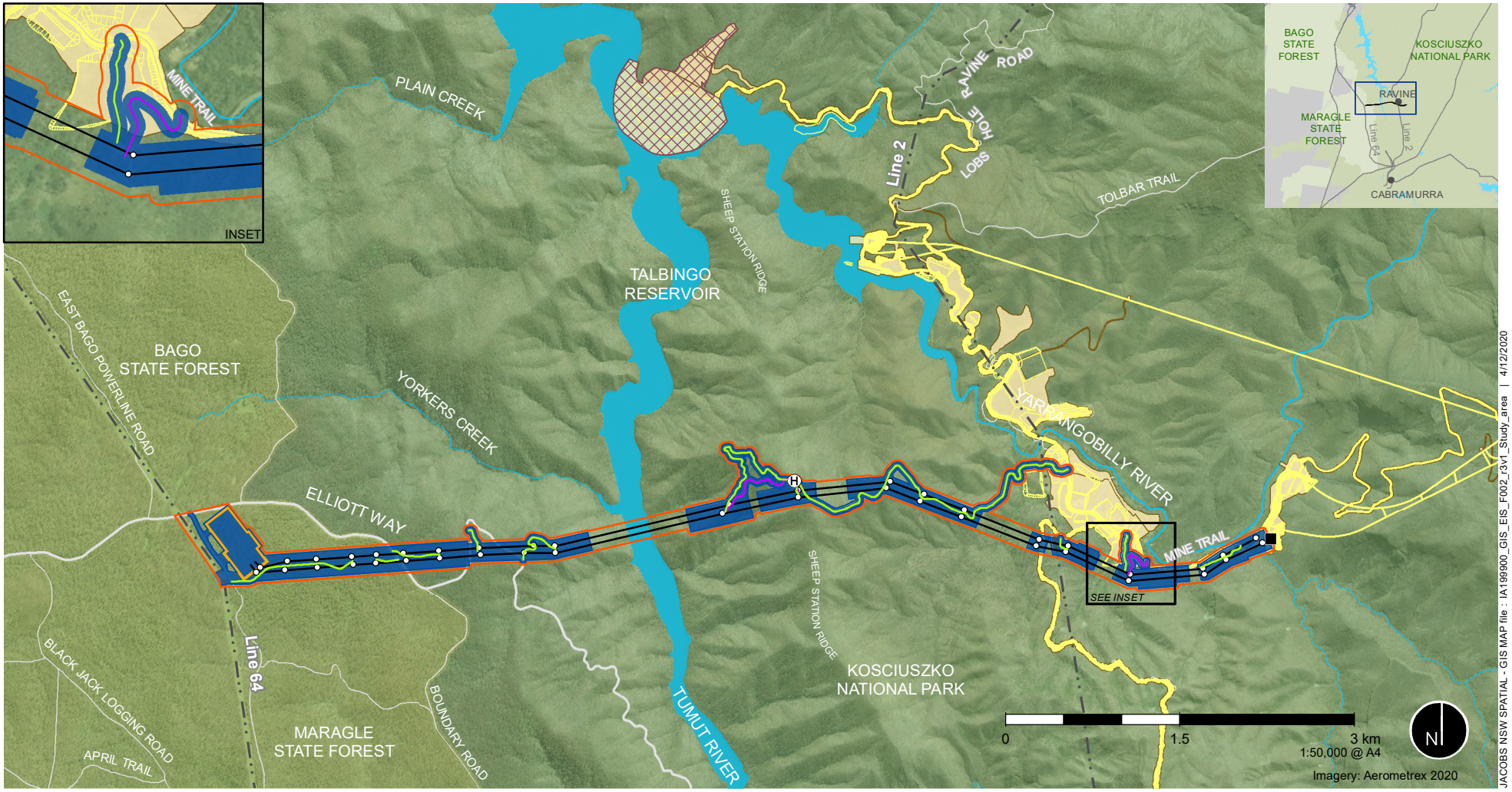
The key elements of the project as exhibited are shown on **Figure 1-1** and include:

- A new substation located within Bago State Forest and adjacent to Transgrid's existing Line 64, which forms a 330 kilovolt (kV) connection between Upper Tumut switching stations (UTSS) and Lower Tumut switching stations (LTSS). The substation would occupy a footprint of about 300 metres wide by 600 metres long inclusive of an approximate 25 metre to 45 metre wide cleared asset protection zone (APZ) surrounding the switchyard
- Upgrade and widening of an existing access road off Elliott Way to the substation including the construction of new driveways into the 330 kV and 500 kV switchyards
- Two new 330 kV overhead double-circuit transmission lines from the Snowy 2.0 cable yard to the new substation:
    - Total length of each line is approximately nine kilometres
    - Located in a transmission corridor ranging in width from approximately 120 metres to 200 metres
    - Each line would comprise approximately 21 steel lattice structures up to 75 metres in height.
- Short overhead 330 kV transmission line connection (approximately 300 metres in length) comprising both steel lattice structures and pole structures as required between the substation and Line 64
- Construction of up to 10 kilometres of new access tracks (Option A) or eight kilometres (Option B) to the transmission structures, and upgrade to existing access tracks where required. Option A minimises disturbance within a mapped high risk naturally occurring asbestos (NOA) zone. The access tracks would remain following the completion of construction to service ongoing maintenance activities along the transmission lines
- Establishment of a helipad (approximately 30 metres wide by 30 metres long) to support the transmission line construction activities carried out at higher elevations

- Ancillary construction activities, including the establishment of tensioning and pulling sites for conductor and earth wire stringing, crane pads, site compounds and equipment laydown areas, and the transport and haulage of equipment and waste to and from the project area
- The accommodation of up to 20 construction workers at the Snowy 2.0 works accommodation at Lobs Hole with the remainder of the construction workforce being accommodated as required in the nearby townships of Tumbarumba, Talbingo, Tumut, Adaminaby, Providence Portal and Cooma.

The eastern extent of the project is defined by the Snowy 2.0 cable yard location at Lobs Hole in Kosciuszko National Park (KNP), which has been approved separately as part of the Snowy 2.0 Main Works Infrastructure Approval (SSI-9867). The project then spans west across Talbingo Reservoir to Transgrid's existing Line 64 in Bago State Forest. Line 64 is the point of connection for the project to the NEM. The project would also provide a connection point into Transgrid's southern network reinforcement project (HumeLink), which when completed would strengthen the southern network, including reducing constraints on Line 64, and would allow the export of the full capacity of Snowy 2.0 across the broader transmission system. HumeLink is not the subject of this EIS or application.

Further information on the project's background, location, approval requirements, strategic need, options, and alternatives are provided in Chapters 1 to 5 of the EIS. The results of the assessment of the potential impacts of the project during construction and operation are described in Chapter 7 of the EIS.



- Project area
- Disturbance area
- Proposed 500kV substation
- Potential helipad location
- Proposed structure
- Proposed transmission line
- Proposed access track - Option A
- Proposed access track - Option B
- Snowy 2.0 cable yard
- Snowy 2.0 element
- Ravine Bay Emplacement Area
- Snowy 2.0 Disturbance footprint
- Electricity transmission line
- Waterway
- Water body
- State forest
- NPWS estate

Figure 1-1 | The project overview as displayed in the EIS

Data source:
Jacobs 2020, TransGrid, EMM 2020,
© Department Finance, Services and Innovation 2018

1.3. Key project amendments since public exhibition

Since exhibition of the EIS, and in response to the issues raised in submissions, Transgrid identified amendments to the project, refer to **Section 3.2.7.4**. These amendments provide functional improvements to the design, confirm elements of the project that were highlighted as opportunities in the EIS, and takes into account ongoing development of the construction methodology.

The amendments to the project since public exhibition are:

- A reduction to the disturbance area from approximately 143 hectares to approximately 125 hectares
- The inclusion of six distinct management zones within the reduced disturbance area
- Access track amendments including the introduction of an additional track and the realignment of another track to align with the positioning of the equipment laydown area adjacent to Transgrid's Ravine substation
- Increased substation footprint to accommodate a wider asset protection zone to meet compliance with AS5339-2018 Construction of buildings in bushfire prone areas
- Alternative spoil disposal within the approved Snowy 2.0 Main Works footprint to accommodate the disposal of spoil generated in project area east
- New water uptake sites to facilitate construction in project area west
- Removal of the helipad.

The project amendments and associated further assessment are discussed in further detail in the *Snowy 2.0 Transmission Connection Project Amendment Report* (Transgrid, 2021a) (Amendment Report) which should be read in conjunction with this Submissions Report.

1.4. Assessment process

The project has been declared critical State Significant Infrastructure (CSSI) in accordance with the provisions of the EP&A Act. The declaration acknowledges that Snowy 2.0 and the project are critical to the State for environmental, economic or social reasons.

As a CSSI project, the project is subject to Part 5, Division 5.2 of the EP&A Act which requires the preparation of an EIS in accordance with Secretary's Environmental Assessment Requirements (SEARs) and the approval of the NSW Minister for Planning and Public Spaces. In addition to requiring approval from the NSW Minister for Planning and Public Spaces, the project has been determined to be a controlled action under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and will require approval from the Commonwealth Minister for the Environment. The Minister for the Environment has accredited the NSW planning process for the assessment of the project, and it will be assessed under the Bilateral Agreement process between the Commonwealth and NSW Governments. Therefore, a single EIS was prepared to address the requirements set out by the NSW Department of Planning and Environment (DPE) (formerly the Department of Planning Industry and Environment (DPIE) and the Commonwealth Department of Agriculture, Water and the Environment (DAWE).

In accordance with the EP&A Act and Environmental Planning and Assessment Regulation 2000 (EP&A Regulation), the EIS was placed on public exhibition for a period of 42 days, between 23 February 2021 and 5 April 2021. The EIS was available for review by the community and stakeholders on the DPE Major Projects website www.planningportal.nsw.gov.au/major-projects.

A total of 40 submissions were received during the public exhibition period, including 24 submissions from individual community members and six submissions from organisations and comments from 10 government agencies. Of the 40 submissions, 65% opposed the project, 35% provided advice/comments. A detailed analysis of matters raised in the submissions is set out in **Chapter 2**.

1.4.1. The next steps

The EIS, this Submissions Report and the Amendment Report will be reviewed by DPE, on behalf of the Minister for Planning and Public Spaces. Once DPE has completed their review, a draft Environmental Assessment Report will be prepared for the Secretary of DPE, which may include recommended conditions of approval (CoA). A final Environmental Assessment Report will then be provided to the Minister for Planning and Public Spaces, who will subsequently decide whether to grant approval, or to refuse the project, under Section 5.19 of the EP&A Act.

As the project has been determined to be a controlled action under the Commonwealth EPBC Act, as noted above, approval from the Commonwealth Minister for the Environment will also be required.

A copy of the Submissions Report and Amendment Report will be made publicly available on the DPE Major Projects website. The NSW Minister for Planning and Public Spaces determination, including any CoA and the Secretary of DPE's Environmental Assessment Report, would be also published on the DPE Major Projects website (www.planningportal.nsw.gov.au/major-projects) following determination.

Should the project be approved, Transgrid and its appointed contractor will continue to consult with community members, government agencies and other stakeholders during the pre-construction, construction and commissioning phases.

If the project is approved, it is expected that construction will commence in mid-2022.

1.5. Purpose and structure of this Submissions Report

The Secretary of DPE provided copies of the submissions received on the EIS to Transgrid. In accordance with section 5.17(6)(a) of the EP&A Act, the Secretary of DPE requested Transgrid to provide a response to the issues raised in those submissions. This Submissions Report documents, considers and responds to the issues raised in community, government agency, and organisation submissions received by DPE during public exhibition of the EIS in accordance with the EP&A Act.

This Submissions Report also describes the actions that have been carried out since the public exhibition period, including further stakeholder consultation, identification of project amendments and further assessment of impacts, and provides an updated justification for the amended project. For the purposes of this Submissions Report, the project as described and assessed in the EIS is referred to as the '**project**' and the project including the amendments is referred to as the '**amended project**'.

This report is structured as follows:

- **Chapter 1: Introduction.** This chapter provides an overview of the project as exhibited, a summary of the assessment process and the purpose of this Submissions Report
- **Chapter 2: Analysis of submissions.** This chapter provides an overview analysis of the submissions received, including numbers, types of submitters and key issues raised

- **Chapter 3: Action taken since exhibition.** This chapter describes the actions that were carried out since the public exhibition period, including further stakeholder consultation and identification and assessment of project amendments
- **Chapter 4: Response to submissions.** This chapter provides responses to the issues raised and updated mitigation measures for the amended project
- **Chapter 5: Updated evaluation of the amended project.** This chapter provides an updated amended project evaluation incorporating any relevant issues raised in submissions
- **Appendix A:** Submission summary
- **Appendix B:** Register of submitters
- **Appendix C:** Key stakeholder responses
- **Appendix D:** *Transmission Connection Project for Snowy 2.0 – Options Report* (EMM, 2021) (Options Report)
- **Appendix E**: *Snowy 2.0 Transmission Connection Project -Supplementary Landscape and visual impact assessment* (Landform Architects, 2022) (Supplementary LCVIA).

An Amendment Report has also been prepared to document proposed project amendments, project clarifications, additional environmental assessment (biodiversity, Aboriginal heritage, water, transport and amenity (visual impact and noise) carried out following exhibition of the EIS, and updated mitigation measures. The additional biodiversity and Aboriginal heritage assessments are documented in *Revised Snowy 2.0 Transmission Project – Biodiversity Development Assessment Report* (Jacobs, 2021) (revised BDAR) and the *Addendum Snowy 2.0 Transmission Project – Aboriginal and Aboriginal Cultural Heritage Assessment Report* (Jacobs, 2021a) (AACHAR) which are attached and summarised in the Amendment Report.

2. Analysis of submissions

This chapter provides a summary of the submissions received during exhibition, including a breakdown of the types and numbers of submissions received and the key issues raised.

2.1. Submissions received

The receipt of submissions was coordinated and managed by DPE. Submissions were received and registered by DPE and uploaded onto their Major Projects website (https://www.planningportal.nsw.gov.au/major-projects/project/10591). Submissions were accepted by electronic online submission or post and were forwarded to Transgrid for review and consideration.

The full submissions can be accessed on the DPE Major Projects website. Each community submitter has been allocated an individual submitter ID from DPE. **Appendix A** lists these community submitter IDs and provides a reference to where the issues raised are responded to in this Submissions Report.

2.1.1. Overview of submitters

DPE received 40 submissions on the project, including 24 from individual community members, six from organisations and comments from 10 government agencies, refer to **Table 2-1**. This translates to 60% of all submissions being made by community members, 25% being made by government agencies and 15% being made by organisations.

Submissions were received from the following government agencies:

- Crown Lands
- Heritage NSW – Heritage Council (Heritage Council)
- DPE – Water Group
- Regional NSW – Mining, Exploration & Geoscience (MEG)
- Heritage NSW – Aboriginal cultural heritage (HNSW)
- NSW Environment Protection Authority (EPA)
- Forestry Corporation of NSW (FCNSW)
- Transport for NSW (TfNSW)
- National Parks and Wildlife Service (NPWS) and Biodiversity, Conservation and Science (BCS) within the Environment, Energy and Science Group (EESG) within DPE.

A submission was also received from the Department of Primary Industries (DPI) Fisheries to state they had no comments.

A further six submissions were received from the following organisations:

- Bushwalking NSW
- Canberra Bushwalking Club
- Dubbo Environment Group
- Greg Piper Member of Parliament (MP)
- National Parks Association of New South Wales (NPA)
- Nature Conservation Council (NCC).

2.1.1.1. Geography of submitters

Local submitters (those within either the Snowy Monaro Regional or Snowy Valleys Local Government Area (LGA)) comprised 16.6% of all submissions. All other submissions were made by community members, government agencies and organisations located in all other LGAs.

2.1.1.2. Position with respect to the project

The submissions can be broken down based on whether they supported, opposed or commented on the project. In particular:

- Of the 40 submissions, 65% opposed the project, 35% provided advice/comments and no submissions (0%) provided support for the project
- Twenty-two (92%) of the 24 community submitters and four (67%) of the six organisations objected to the project. The remaining submitters (including all government agencies) provided comments for consideration.

The breakdown of the submissions received is provided in **Table 2-1**.

Table 2-1 Breakdown of submission recorded by DPE

Source/type	Object	Support	Comment	Total
Community members – individual	22	0	2	24
Government agency	0	0	10	10
Organisations	4	0	2	6
Total	**26**	**0**	**14**	**40**

2.2. Analysis of submissions – categories of issues

All submissions received were collated and categorised based on who they were from, in accordance with the following submitter types:

- Community members – individual
- Government agencies
- Organisations.

Each submission was reviewed, and the issues raised were identified and categorised in accordance with Appendix C to DPE's Guidelines, entitled *Preparing a Submissions Report* (DPIE, July 2021). Each category was then divided into key issues and sub-issues, as summarised in **Table 2-2**. These issue categories, key issues and sub-issues form the basis for the structure of responses to the issues raised which is provided in **Chapter 4**. Where relevant, input to the responses was sought from the technical specialists who assisted with preparation of the EIS and technical assessments.

Table 2-2 Categorisation of issues raised in submissions

Issue category	Key issues	Sub-issues
The project	Alternatives and options	• Options assessment process • Alternatives, in particular: - The project should be underground - The scale of the project - Over canopy design • Transmission route options
	Project elements	The project elements that make up the project: • The substation • Ancillary infrastructure - access tracks and waterway crossings • Rehabilitation • Ongoing maintenance during operation – easement, substation and access tracks
	Construction method	• Activities - disturbance area, vegetation clearing, erosion and sediment control, spoil management, works over Talbingo Reservoir and dewatering • Resources – the availability of water required for construction
Procedural matters	Assessment and approval	• The assessment process – adequacy and legality • Adequacy of the EIS • Adequacy of the technical assessments • Issues after project approval • Consultation/engagement
Economic, environmental and social impacts of the project (project impacts)	Biodiversity	• Project impacts: - Construction - Operation • Mitigation (including monitoring programs and offsets) • Other (such as acquisitions and fire management)
	Aboriginal heritage	
	Non-Aboriginal heritage	
	Water quality	
	Flooding	
	Land	
	Transport	
	Landscape and visual	
	Noise and vibration	
	Air quality	
	Hazards and risks	
	Socio-economic	
	Waste	
	Cumulative impacts	

Issue category	Key issues	Sub-issues
Project evaluation	Project justification	• Public interest • Ecologically sustainable development (ESD)
	Costs and funding	Costs
Issues beyond the scope of the project	Out of scope	• Other Transgrid projects / HumeLink • Other out of scope issues

2.3. Overview of issues raised

2.3.1. Breakdown of issues raised

The frequency of the issue categories and key issues raised in the submissions are summarised in **Table 2-3** and shown comparatively in **Figure 2-1**. As some of the submissions raised more than one issue, the number of issues identified is greater than the total number of submissions received.

Table 2-3 Summary of key issues raised

Issue category	Number of submissions	Percentage of submissions identifying issue category (%)	Key issues	Number of submissions identifying key issue	Percentage of submissions identifying key issue (%)
The project	42	50	Alternatives and options	29	35
			Project elements	8	10
			Construction method	5	6
Procedural matters	11	13	Assessment and approval	11	13
Project impacts	26	31	Biodiversity	5	6
			Aboriginal heritage	2	2
			Non-Aboriginal heritage	3	4
			Water quality	2	2
			Flooding	1	1
			Land	3	4
			Landscape and visual	2	2
			Transport	6	7
			Hazards and risks	2	2

Issue category	Number of submissions	Percentage of submissions identifying issue category (%)	Key issues	Number of submissions identifying key issue	Percentage of submissions identifying key issue (%)
Project evaluation	4	4	Project justification	3	4
			Costs and funding	1	1
Issues beyond the scope of the project	1	1	Out of scope	1	1
Total	**84**	**-**		**84**	**-**

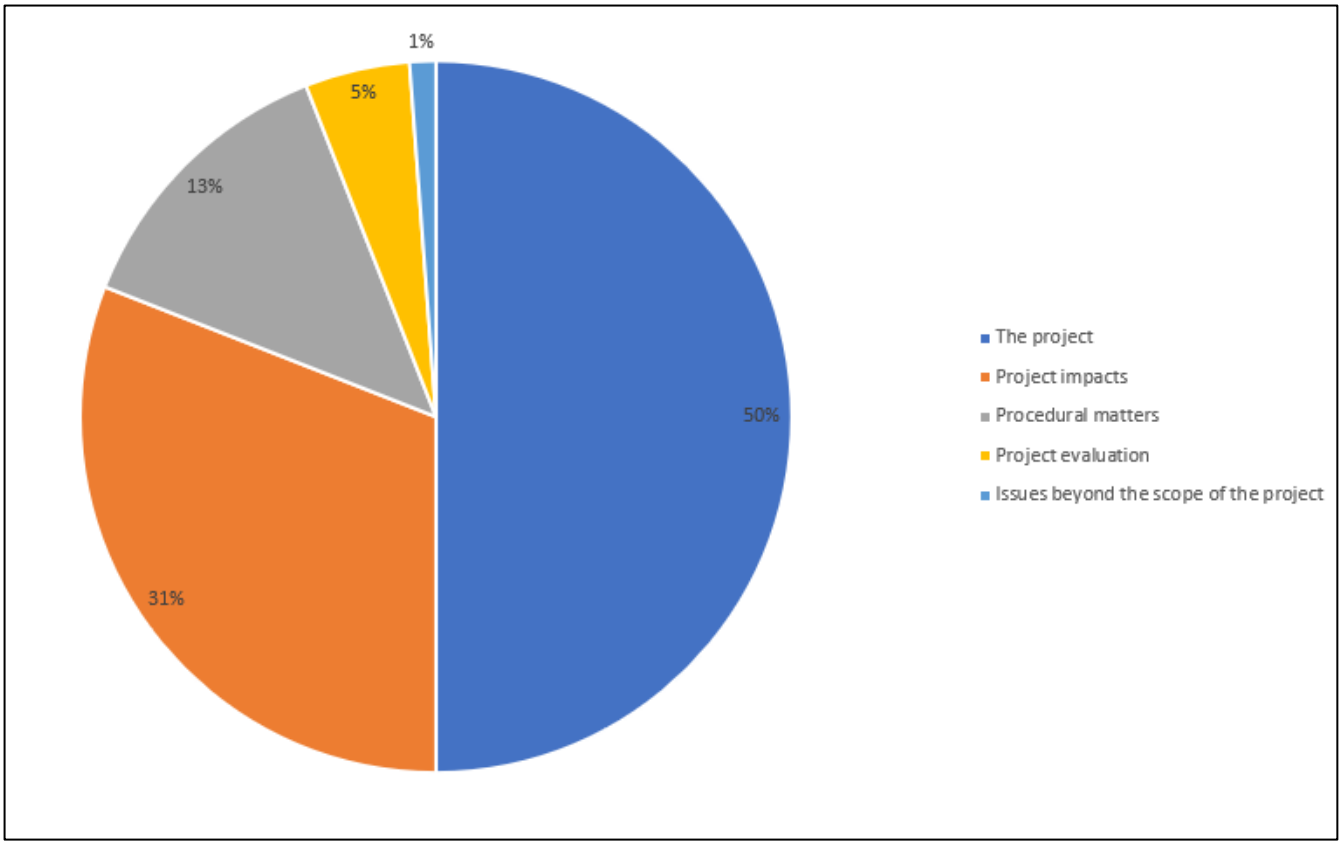


Figure 2-1 Issue categories raised in the submissions

As shown in **Figure 2-1**, the most frequently raised issue categories were:

- The project (50%). Key issues were alternatives and options, project elements and construction method
- Project impacts (31%). Key issues include adverse impacts on biodiversity (including the ecological values of KNP), Aboriginal and Non-Aboriginal heritage items, and landscape and visuals (e.g. from vegetation clearing (landscape scarring) and the presence of new transmission infrastructure) Procedural matters (13%). The key issue was assessment and approval.

The majority of the submissions (69%) for the top key issue (being 'alternatives and options' for the project) queried whether the project transmission connection could or should be underground. Many submissions in this category specifically expressed concerns that the project should be underground to reduce the project's environmental impact particularly for biodiversity and visual aspects.

2.3.2. Government agencies and organisations

A high-level summary of the stakeholder submissions received, and the issue category and key issues raised is provided in **Table 2-4**. Responses to the issues are provided in **Chapter 4** according to these categories. Due to the length and complexity of these submissions, a more fulsome summaries and responses to issues raised is provided in **Appendix C**.

Table 2-4 Summary of government agencies and organisations submissions

Agency	Issue category	Key issues	Particular issues raised[1]
Government agencies			
Crown lands	Project impacts	Land	Potential impact on a Crown Road.
Heritage Council	Project impacts	Non-Aboriginal heritage	• Clarification of significance and impacts on non-Aboriginal heritage • As the project area contains local heritage items, and other local items are in the vicinity, advice should be sought from the relevant local council • Recommendations of archaeological conditions including nominating a suitably qualified and experienced historical archaeologist to manage the historical archaeological program and the preparation of the Archaeological Research Design and Excavation Methodology.
DPE – Water Group	The project	Project elements	• Stream crossing designs needed to protect water quality and stream function.
		Construction methods	• Confirmation that the quantity of water required for construction is available • If the groundwater take exceeds three megalitres (ML), Transgrid will need to obtain sufficient entitlement in the groundwater source to account for the water take • A Soil and Water Management Plan (SWMP) is required to be prepared to manage potential impacts to watercourses.
	Project impacts	Biodiversity	Carry out suitable studies of structure locations and vehicular access to avoid, manage and mitigate impact to alpine ferns or other Plant Community Types (PCT) or GDEs.
MEG	Project impacts	Land	A new Exploration Licence (EL 9056) overlies a portion of the project area to the west.
HNSW	Project impacts	Aboriginal heritage	Some of the project area remains unsurveyed and untested and the full impacts to Aboriginal cultural heritage values remain unknown.
EPA	The project	Project elements	The management of water generated at the substation is unclear
		Construction methods	• Spoil management and the use of emplacement areas • Any dewatering activities must achieve the water quality objectives (WQO).
	Project impacts	Water quality	• Need for an appropriate level of ecosystem protection and the requirement for a water quality monitoring program • Lack of baseline water quality data.

Agency	Issue category	Key issues	Particular issues raised[1]
FCNSW	The project	Project elements	• Rehabilitation must be agreed with FCNSW • Ongoing maintenance and rehabilitation must be planned and funded by Transgrid.
		Construction methods	• FCNSW has not commenced discussions with Transgrid about disposal of rock, soil or mulched vegetative material on the State Forest • Vegetation clearing.
	Project impacts	Biodiversity	Monitoring programs should be designed in collaboration with FCNSW.
		Land	• Any economic loss needs to be addressed as part of the land acquisition process. • Ongoing maintenance of the easement is required at Transgrid's cost • Post construction rehabilitation of the substation surrounds, and the easement must be planned and funded by Transgrid.
		Transport	Transport through Batlow could be avoided through the use of sealed roads owned by FCNSW.
		Hazards and risks	• FCNSW must retain all current road access for forest and fire management purposes. • Bushfire protection measures must occur annually, as agreed with FCNSW, and be funded and implemented by Transgrid • Preventative fire mitigation practices within FCNSW's Forest Practices Codes will be applied to the construction and maintenance works of the project.
TfNSW	Project impacts	Transport	TfNSW suggested that the following requirements be included in any approval issued: • The development is to comply with requirements in the submitted Snowy 2.0 Transmission Connection Project Traffic and Transport Impact Assessment (Jacobs, 2020) • A fatigue and weather condition management plan for both light and heavy vehicles that details driver protocols for both driver fatigue and adverse weather conditions shall be prepared before the commencement of the project as well as implemented and reviewed as required, for the duration of the project.

Agency	Issue category	Key issues	Particular issues raised[1]
NPWS/ BCS	The project	Alternatives and options	• Consideration of all options to reduce impacts, and compensate for any remaining unavoidable impacts (e.g. visual amenity) in addition to biodiversity impacts • There are gaps in the options analysis including comparison of all relevant parameters such as clearing and construction disturbances, residual disturbance area, spoil volumes, visual amenity impacts and costs.
		Project elements	• Potential post-construction liability – If the project is approved, the potential liability for NPWS post construction circumstances needs to be addressed • Further details are to be provided on rehabilitation • The waterway crossing of sheep station ridge should be a bridge.
		Construction method	• Further details are required on the exclusion zones over Talbingo Reservoir, vegetation clearing and soil management.
	Project impacts	Biodiversity	• Impacts to KNP • More detail and further analysis about offsetting and how credits will be determined and how the credit obligation can be met within and outside KNP is required.
		Aboriginal heritage	Management of Aboriginal Heritage values.
		Non-Aboriginal heritage	Management of non-Aboriginal heritage values.
		Water	Surface water management and water quality issues are likely to be an ongoing concern.
		Flooding	The EIS and Hydrology Assessment does meet the SEARs for flooding. However, the qualitative flood risk assessment requires more work to meet BCS requirements for flooding assessment. As such, BCS suggested quantitative flood modelling and assessment be completed during the detailed design and included as a CoA.
		Transport	• Further details to be provided on both the project traffic that would use Elliott Way and the works over Elliott Way • That any road improvements required for the project are identified and considered within this assessment and are not dealt with under different approval instruments • Potential traffic safety risks due to the project access tracks intersecting with Elliott Way.

Agency	Issue category	Key issues	Particular issues raised[1]
		Landscape and visual	NPWS disagrees with some of the statements and assumptions in the Landscape Character and Visual Impact Assessment (LCVIA).
		Hazards and risks	Bushfire management in KNP.
	Procedural matter	Assessment and approval	• BDAR is not fully compliant with the Biodiversity Assessment Method (BAM) • A number of other recommended CoA were suggested. NPWS and BCS have requested that the CoA be prepared in consultation with them.
Organisations			
Bushwalking NSW	The project	Alternatives and options	Transmission lines should not be built within the KNP at all. However, if they are to proceed then they should be underground lines.
Canberra Bushwalking Club	The project	Alternatives and options	The transmission lines should be located underground.
Dubbo Environment Group	The project	Alternatives and options	The transmission lines should be located underground.
Greg Piper MP	The project	Alternatives and options	The transmission lines should be located underground.
NPA	The project	Alternatives and options	• The transmission lines should be located underground • NPA provided a Background Paper Going underground with the transmission connection for Snowy 2.0 (NPA, 2021) which suggested Transgrid consider a number of recommendations about alternative connection options for the project.
	Project impacts	Landscape and visual	The visual impact/intrusiveness of the project would be far greater than any of the existing transmission lines through the KNP.
	Project evaluation	Project justification	The Kosciuszko National Park Plan of Management (KNP PoM) prohibits additional overhead transmission lines. More overhead transmission lines are therefore “not in the public interest”.

Agency	Issue category	Key issues	Particular issues raised[1]
NPA	Procedural matters	Assessment and approval	• The proposed amendment to the KNP PoM to lift the prohibition on new overhead transmission lines is inappropriate and does not meet the requirements of Section 72AA of the *National Parks and Wildlife Act 1974* (NPW Act). On this basis, the project should therefore not be approved • The EIS fails to include an analysis of any feasible alternatives • The EIS fails to consider cumulative impacts of the overhead lines on top of the other components of the Snowy 2.0 project, as well as the existing transmission lines within the KNP. • The EIS fails to propose best-practice environmental damage mitigation measures. Proposed mitigations are limited to the future preparation of a Construction Environmental Management Plan (CEMP) and associated sub-plans.
NCC	The project	Alternatives and options	The transmission lines should be located underground.
	Procedural matters	Assessment and approval	The EIS does not sufficiently investigate options to put transmission lines underground.

Note 1: Full details of the issues and responses are provided in **Appendix C**.

The government agencies and organisation submissions raised issues falling into four of the five issue categories. The proportion of issues falling into each category were:

- Project impacts (46%)
- The project (40%)
- Procedural matters (8%)
- Project evaluation (6%).

This is shown in **Figure 2-2**.

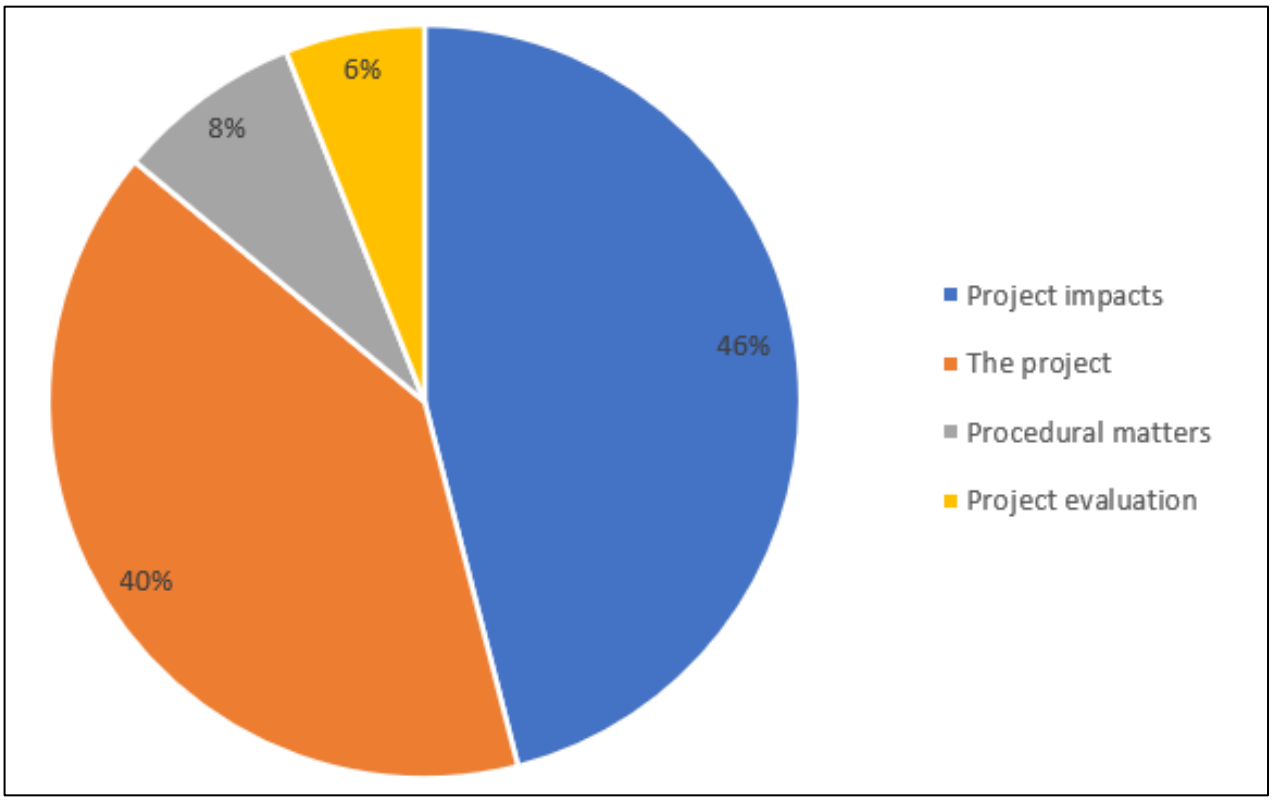


Figure 2-2 Issue types raised in government agencies and organisation submissions

2.3.3. Community submissions

The issues raised by community submissions related to all five categories, and the proportion of issues falling into each category were:

- The project (65%)
- Procedural matters (21%)
- Project impacts (9%)
- Project evaluation (3%)
- Issues beyond the scope of the project (3%).

This is shown in **Figure 2-3**.

All of the submissions for the top key issue (being 'alternatives and options' for the project) queried whether the project transmission connection could or should be underground.

The full breakdown of the issue type and key issue category raised in community submissions is provided in **Table 2 3** in **Appendix A**. As some of the submissions raised more than one issue, the number of issues identified is greater than the total number of submissions received. Responses to the submissions by issue type, key issue categories and sub-issue categories is provided in **Chapter 4**.

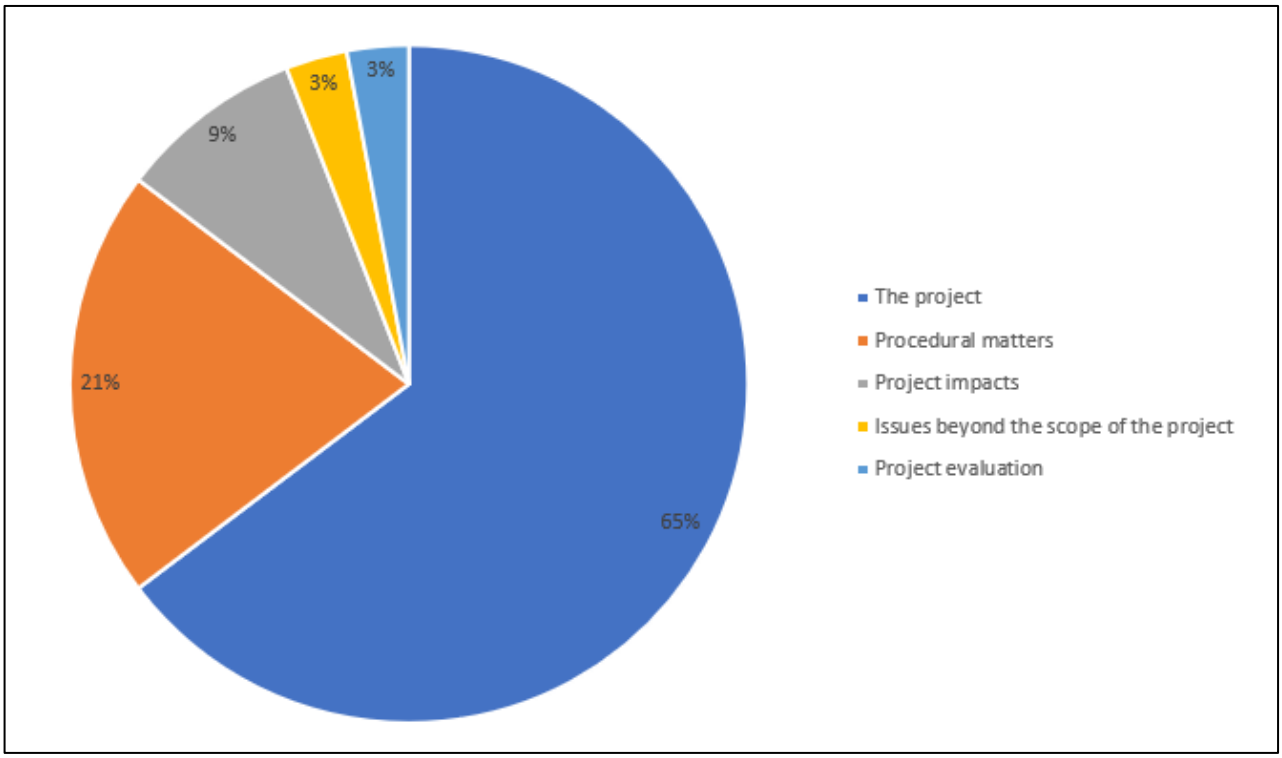


Figure 2-3 Issue types raised in community submissions

3. Actions taken since exhibition

This chapter summarises the actions carried out since the public exhibition period to address the issues raised in the submissions received. The actions included:

- Undertaking further engagement with the government agencies and Snowy Hydro and Aboriginal stakeholders
- Investigating alternative cable installation technologies through a further options assessment
- Amending the project
- Carrying out further assessment of the impacts of the project.

3.1. Further engagement with stakeholders

Transgrid has engaged further with stakeholders since exhibition of the EIS, building on previous extensive engagement with the community and key stakeholders (including government agencies and organisations) regarding the project since 2018.

3.1.1. Consultation during EIS exhibition

During the EIS public exhibition period, the community and other stakeholders were able to review the EIS and make a written submission to the DPE for consideration in its assessment of the project.

During this time, Transgrid carried out further consultation with key government stakeholders using several of the consultation methods outlined in **Table 3-1**.

Table 3-1 Consultation during the EIS public exhibition period

Activity	Details
Project website	Information about the public exhibition of the EIS was provided on the Transgrid website (https://www.transgrid.com.au/what-we-do/projects/current-projects/Snowy%202.0/Pages/Snowy%202.0%20Connection%20Project.aspx) including a Fact Sheet, Community Guide to the EIS, and map. Information was also provided as to how community members could view the EIS, contact a Transgrid representative or make a submission to DPE.
Community contact points	The Transgrid community information line and community email address were available: • Community Information Line – 1800 222 537 • Community email address – community@transgrid.com.au
Advertisements	Advertisements were placed in the following local papers to provide information on the exhibition of the EIS, and information sessions: • The Australian • The Daily Telegraph • The Sydney Morning Herald • Tumbarumba Times • Monaro Post • Tumut and Adelong Times.

Activity	Details
Fact Sheet and Community Guide	A Fact Sheet and Community Guide were prepared which included contact details, how to access the EIS and information on how to make a submission. These were distributed to individuals, community groups, key stakeholders and agencies through, eg, the project website, emails and community information sessions.
Emails	• An email newsletter including the Community Guide was sent to all previous individual contacts and to over 30 community groups. Community groups included local Country Women's Associations, Chambers of Commerce, Lions Clubs, Rotary, Industry Associations such as the softwoods industry and apple growers, cycling groups and Visitor Information Centres among others. The newsletter advertised that Transgrid representatives would be available to provide information at Tumbafest during the weekend of February 27 and 28, 2021 • An email which also included a copy of the Community Guide was sent to key stakeholders including local and NSW government representatives and key agencies on Transgrid's behalf by DPE.
Community information sessions	• Transgrid provided sponsorship to Tumbafest which provided signage and announcements from the Main Stage of the two-day event in February 2020 • Transgrid representatives were in attendance and over 150 people visited the Transgrid stall to learn more and discuss the project • Maps, a Fact Sheet and Community Guide that provide information on the EIS were available.
Other engagement activities	• A briefing was provided for representatives of NPA following provision of written material • Local council briefings included: - Phone calls to the Snowy Valleys Council and Snowy Monaro Regional Council following provision of printed material - Follow-up Zoom briefing with Snowy Valleys Council.

3.1.2. Consultation following the EIS exhibition

Following exhibition of the EIS, the consultation activities have focused on addressing the key issues raised in the submissions. As such, a number of direction consultation and engagement activities have been carried out since exhibition of the EIS with a range of stakeholders including government agencies, Snowy Valleys Council, Snowy Hydro and Aboriginal stakeholders.

In particular, extensive engagement with government agencies has occurred in relation to key issues raised in the submissions, further options assessment, property acquisition, project amendments, construction methodologies including vegetation clearing, rehabilitation, erosion and sediment control and water quality.

Chapter 5 of the Amendment Report details the consultation carried out, the topics and issues discussed and the outcomes of the consultation.

3.1.3. Future consultation

Transgrid and its appointed contractor will continue to consult with community members, government agencies and other stakeholders during the pre-construction, construction and commissioning phases.

As part of Transgrid's ongoing Community Engagement Plan, the Transgrid community information line and community email address will continue to be available during construction. Targeted consultation methods, such as letters, notifications, signage and face-to-face meetings, will also continue as required. Updates on progress of the project will be available on the Transgrid website and social media platforms.

3.2. Further options assessment

The EIS considered several project options to determine the optimal solution to meet the transmission connection objectives. In particular, options were considered in the EIS for the:

- Substation location and connection point
- Type of connection such as underground and overhead
- Transmission route selection.

The EIS concluded that the preferred project option consists of an overhead transmission connection connecting the Snowy 2.0 cable yard within KNP to Line 64 via a new substation located within Bago State Forest.

However, given that the most frequently raised key issues related to options and alternatives, Transgrid has carried out a comprehensive review and further analysis of the options included in the EIS as well as other potentially feasible options. This seeks to address the matters raised in the submissions, including those raised by the NPA, regarding different connection locations and methods of connecting to the NEM.

The further options assessment and analysis carried out since the display of the EIS is documented in the Options Report which is provided in Appendix D. The Options Report also provides:

- An overview of the NEM and its current constraints
- How Snowy 2.0 helps overcome some of those constraints, as well as an overview of the risks to the NEM should Snowy 2.0 not be able to transmit power
- A summary of the classification of Snowy 2.0 and the upgrades required to the electricity network to transmit power from Snowy 2.0 as infrastructure that is deemed to be critical to the State of NSW (i.e. CSSI)
- Details on the project and its requirements, including network resilience, design, construction, maintenance and safety requirements.

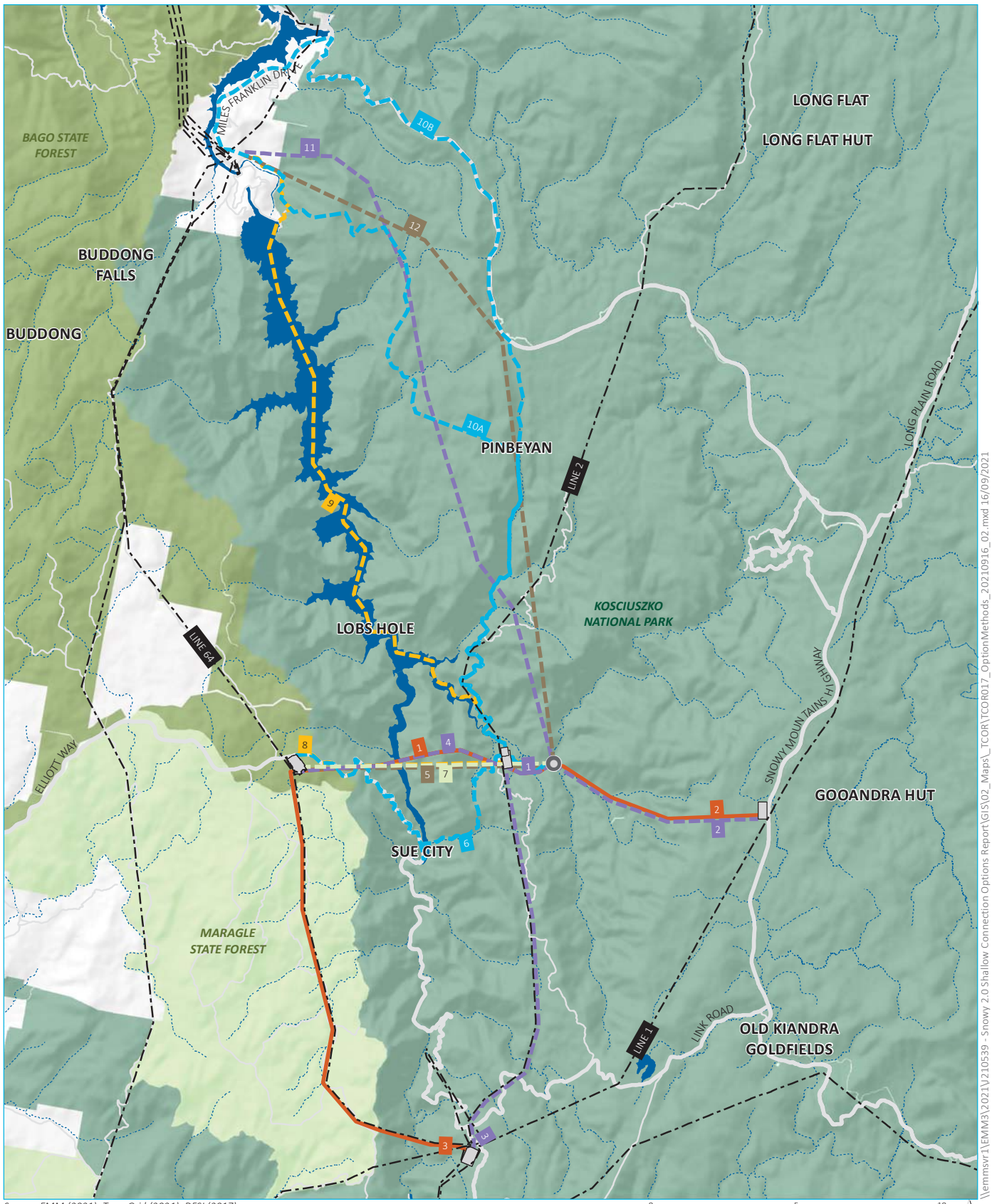
The findings from the further options assessment and analysis are summarised below.

3.2.1. Options assessment and analysis method

Following exhibition of the EIS, and in response to submissions received, the DPI requested that Transgrid document options considered, regarding different connection locations and methods of connecting to the NEM. EMM Consulting Pty Ltd (EMM) was subsequently engaged to prepare this Options Report.

To inform the Options Report, and through engagement with Snowy Hydro, Transgrid derived 12 options (refer to **Figure 3-1**) to be assessed from investigations and studies carried out to inform project development since its inception in 2017 including those documented in the EIS. Two energy engineering studies were also commissioned to further inform the analysis of the selected options.

Preparation of the Options Report was carried out in consultation with DPE and NPWS encompassing several progress update meetings and separate information request deliverables.



Source: EMM (2021); TransGrid (2021); DFSI (2017)

0 5 10 km

GDA 1994 MGA Zone 55

N

KEY

- Snowy 2.0 cable yard
- HumeLink options
- Substation footprint

Transmission connection options (by method)

- Overhead
- Deep cable
- Trench
- HDD
- Hybrid

- Existing electricity transmission line
- Major road
- Minor road
- Named watercourse
- Waterbody
- Kosciuszko National Park
- Bago State Forest
- Maragle State Forest

Transmission connection options

Transgrid – Snowy 2.0
Transmission Connection Options Report
Figure 3-1

EMM creating opportunities

3.2.2. Project and network requirements

The key aim requirement of the project is to transmit the +/- 2,000 MW of power generated/pumped to and from Snowy 2.0 into the NEM so that it can be distributed effectively and efficiently to consumers. The point of transfer/connection between generation and transmission for this project is the Snowy 2.0 cable yard at Lobs Hole within KNP. When full Snowy 2.0 generation capacity is available it would increase the 'Tumut' locality generation density to approximately 3,800 MW.

This is an increased very high concentration of generation and load in a locality power (circa Latrobe Valley for generation capacity and the size of a large industrial urban city for load capacity) that needs to be managed appropriately through a risk and reliability based approach to transmission development, to improve system resilience and ensure system security. These factors must be addressed, which can be achieved through the design and construction of the connection of Snowy 2.0 to the NEM connection.

There are significant existing binding constraint points both north and south of the Snowy Scheme, even without the addition of Snowy 2.0 capacity. Maragle was chosen as the Snowy 2.0 HumeLink connection point as it is remote from other substations/switching stations that connect the existing Snowy Scheme generation and Victorian interconnector, meaning that risks are reduced due to geographical separation, and it also allows for greater control of power flows. To integrate the Snowy 2.0 HumeLink connection point with the existing Upper Tumut Switching Station (UTSS) or Lower Tumut Switching Station (LTSS), or southern NSW 330 kV lines (eg Line 2) would reduce the system resilience gained through geographical diversity which is achieved by locating the Snowy 2.0 connection point at Maragle.

It would also expose five key energy assets (Snowy 2.0, HumeLink, Southern NSW 330 kV network, Victoria to NSW Interconnector (VNI) and existing Snowy Hydro Scheme) to bushfire and extreme weather events at specific locations. Given the criticality of the power generation from Snowy 2.0 to ensure the stability and energy security and reliability for the NEM, as demonstrated through the CSSI declaration of Snowy 2.0 which includes this project, a key design objective is to minimise the risk of losing the ability to transmit this power to consumers. Electricity network reliability standards govern how network infrastructure is designed, built and operated to avoid or manage interruptions to electricity supply which includes damage to network infrastructure. The level of redundancy specifies the number of backup arrangements (either 1, 2, or 3) that must be in place to support continued supply of electricity in the event that part of the transmission network fails. The redundancy requirement for Snowy 2.0 connection assets is n-1, meaning that there must be one backup arrangement in place.

Construction options for transmission lines include:

- Overhead transmission lines
- Cables within tunnels
- Cables within trenches
- Submarine cables
- A combination of the above.

Each of these construction options have different design, construction, maintenance and safety requirements that means that they are suited to particular terrain and environmental conditions.

KNP is one of Australia's sub-alpine national parks and also represents one of the most complex conservation reserves in Australia. Several threatened ecological communities and populations are found in proximity to the location where Snowy 2.0 is being constructed. Impacts to biodiversity was a key assessment and

regulatory matter for the Snowy 2.0 Main Works project and for this project. Minimisation of impacts to KNP and its values is a key project objective.

3.2.3. Project objectives and evaluation criteria

The method of option analysis undertaken included the review of the project's objectives, in consideration of the network and project requirements, and development of project evaluation criteria for assessment of the Project options.

The Project objectives that have been identified for the options analysis are presented in **Figure 3-1**.

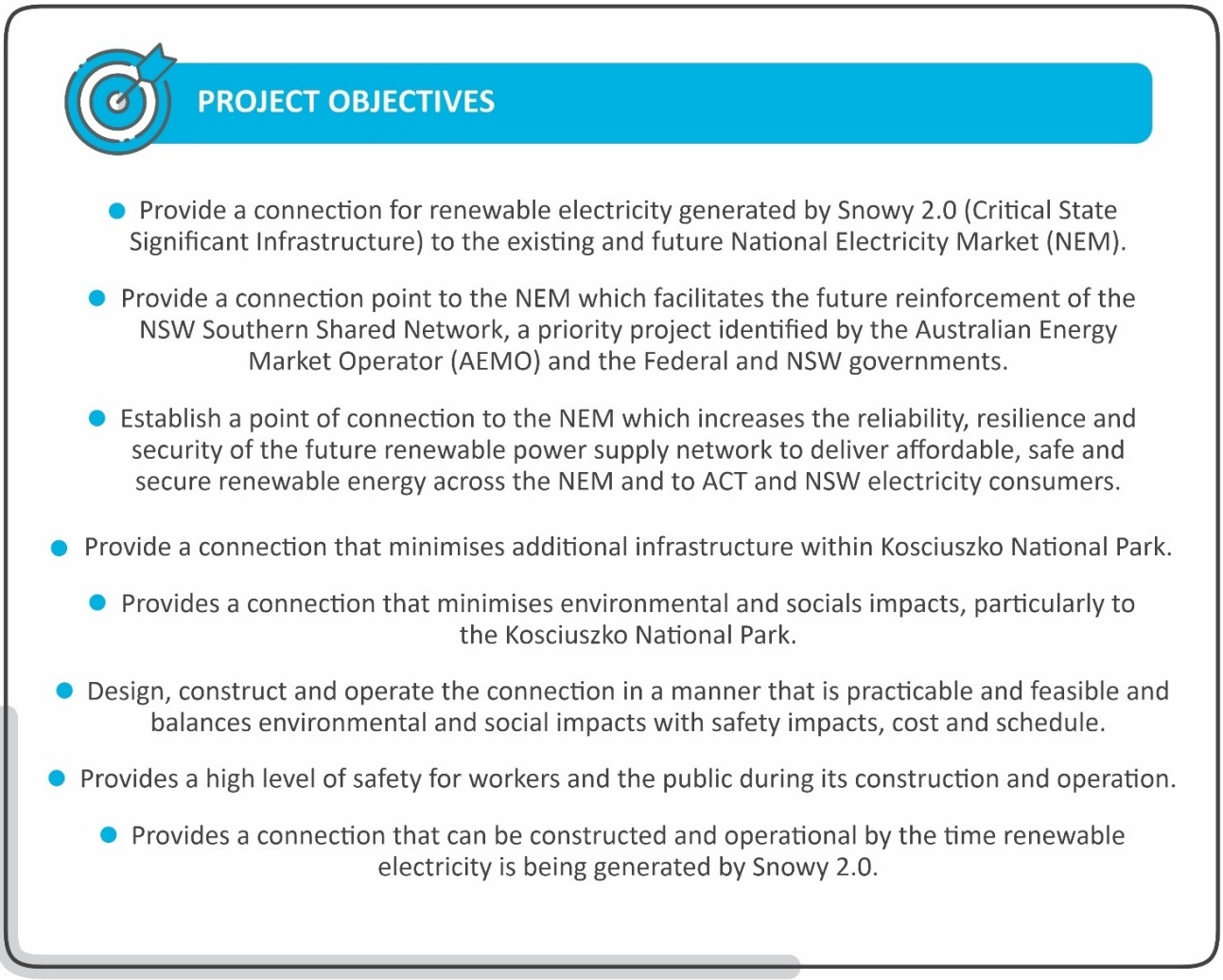


Figure 3-2 Project objectives

(source: Options Report (EMM, 2021))

Figure 3-3 presents the evaluation criteria that have been identified for this options assessment and analysis based on the project objectives. The criteria are separated into three categories:

- Technical
- Environment and planning
- Safety.

The evaluation criteria have also been separated into sub-categories where applicable, refer to **Figure 3-3**.

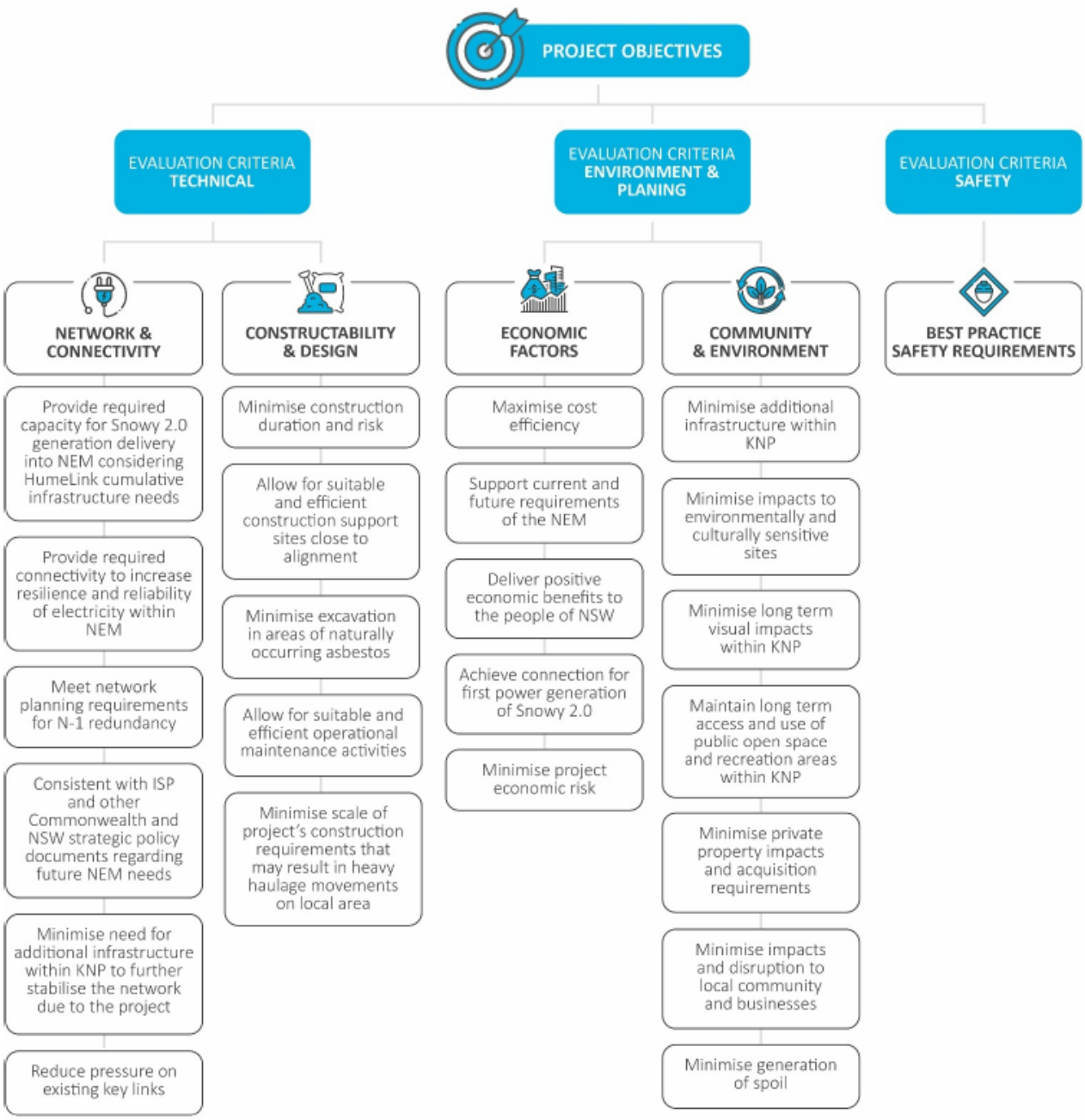


Figure 3-3 Project evaluation criteria

(source: Options Report (EMM, 2021))

3.2.4. Evaluation criteria

The options included in the further options assessment were based on the options for transmission network connections for Snowy 2.0 developed by Transgrid and Snowy Hydro prior to preparation of the EIS, and the viable alternative connection options for the project recommended in the submission by NPA.

A total of 12 options were identified based on various combinations of connection point options and transmission methods as shown on **Figure 3-1**.

Connection to both the 330 kV and future 500 kV network (through a new 330 kV and 500 kV switching stations) is required with the current HumeLink proposal. The alternative connection point options include connection to existing transmission assets and the future 500 kV network as follows:

- 330 kV transmission lines, being Line 1, Line 2 and Line 64
- Switching stations being UTSS and LTSS
- Future 550 kV line and 500 kV substation.

Connection points also included locations to the north, east, south and west of the Lobs Hole cable yard and connections within and external to KNP. The connection point to the north is LTSS. The connection to the east is Line 1. The connection point to the south is UTSS, while the connection points to the west are Line 2 and Line 64. Connection points inside KNP include Line 1, Line 2 and UTSS. Connection points outside of KNP include LTSS and Line 64.

The alternative transmission methods include:

- Overhead transmission lines
- Cables within tunnels
- Cables within trenches
- Submarine cables
- A combination of the above.

Based on the above, the 12 options developed were:

- Option 1 – Overhead to Line 2
- Option 2 – Overhead to Line 1
- Option 3 – Overhead to UTSS
- Option 4 – Overhead to Line 64 (This is the base case and the 'project' as described in the EIS)
- Option 5 – Deep cable tunnel to Line 64 (This option is presented as Alternative A (with tunnel construction) in NPA's submission)
- Option 6 – Trench to Line 64 (This option is similar to Alternative B in NPA's submission)
- Option 7 – Horizontal directional drilling (HDD) to Line 64 (This option is presented as Alternative A (with HDD) in NPA's submission)
- Option 8 – Hybrid trench/deep cable tunnel to Line 64 (This option is a combination of Alternative A and B in NPA's submission)
- Option 9 – Hybrid trench/submarine cable to LTSS (This option is presented as Alternative C in NPA's submission. This option is also similar to Alternative E2 in NPA's submission)
- Option 10 – Trench to LTSS
- Option 11 – Overhead to LTSS
- Option 12 – Deep cable tunnel to LTSS (This option is similar to Alternative D in NPA's submission).

The options and connection points are also summarised in **Table 3-2** which shows the matrix of the different connection points to the transmission network and methods of transmission.

Table 3-2 Options and connection points

Connection point	Method of transmission				
	Overhead	Underground deep	Trench	HDD	Hybrid
West of KNP (Line 64)	Option 4	Option 5	Option 6	Option 7	Option 8 (trench and tunnel)
Within KNP (Line 1 or 2 or UTSS)	Option 1, 2 and 3			-	-
North of KNP (LTSS)	Option 11	Option 12	Option 10	-	Option 9 (trench and submarine cable)

3.2.5. Option screening

A screening assessment of the 12 options that were developed to provide the transmission network connection for Snowy 2.0 was carried out against the project objectives and evaluation criteria.

The results of the screening assessment indicated that eight options did not meet the set objectives and considered technically viable or unacceptable relating to the evaluation criteria including:

- Require significant additional assets to be constructed within KNP and would bring additional HumeLink infrastructure into KNP, including a new substation and 500 kV lines (Option 1, Option 2, Option 3)
- Are not technically viable (Option 7, Option 9)
- Do not ensure the resilience and reliability of the NEM in the context of dramatically increased intermittent generation from renewable sources (Option 10, Option 11 and Option 12).

Option 7 was deemed to be technically unviable because it is unsuitable for steep terrain, has a high probability of tunnel drift during drilling and also requires the transition to overhead transmission over Talbingo Reservoir.

Option 9 was deemed to be technically unviable because of the required construction methodology within Talbingo Reservoir and the construction schedule. It would not enhance the resilience and reliability of the NEM as it increases the concentration of transmission circuits within a single corridor north of LTSS, and it also would likely have significant environmental impacts associated with dredging within the reservoir.

The full evaluation is provided in Appendix A of the Options Report. Refer to Section 7 of the Options Report (**Appendix D**) for full discussion on each of the options.

Technical calculations such as the area of vegetation clearance, spoil volumes, construction schedule and construction costs were not generally carried out for the options that were considered technically unviable or unacceptable.

As a result of the screening assessment, the four options recommended to be considered for detailed assessment were:

- Option 4 – Overhead to Line 64
- Option 5 – Deep cable tunnel to Line 64
- Option 6 – Trench to Line 64
- Option 8 – Hybrid trench/deep cable tunnel to Line 64.

3.2.6. Post screening assessment and agency engagement

The results of the screening assessment were presented to DPE and NPWS. Further detailed information was requested and supplied to DPE and NPWS (see **Section 3.1.2**) to further understand the design considerations and significance of impacts associated with three of the four options that had been proposed to move forward to detailed analysis from the screening assessment (Options 5, 6 and 8) and to further consider Options 3 and 9. As a result the following six options were subject to further detailed analysis:

- Option 3 – Overhead to UTSS
- Option 4 – Overhead to Line 64
- Option 5 – Deep cable tunnel to Line 64
- Option 6 – Trench to Line 64
- Option 8 – Hybrid trench/deep cable tunnel to Line 64
- Option 9 – Hybrid trench/submarine cable to LTSS.

The post screening detailed options assessment and analysis for these six options are provided in Section 8 of the Options Report (**Appendix D**).

The comparison of the six options is provided in **Table 3-3**. The environmental considerations in this table (with the exception of Option 4) are high level as detailed environmental assessments (such as targeted ecological surveys, archaeological investigations) have not been carried out for these options, however detailed information collated for the Snowy 2.0 Main Works project as well as the Transmission Connection Project were used inform these options assessments.

A second meeting was held on 10 August 2021 with DPE and NPWS to further discuss the options assessment. In consultation with DPE and NPWS, it was resolved that Options 5, 6, 8 and 9 would not proceed to a detailed assessment as, primarily, they did not meet the evaluation criteria relating to economic factors; specifically they significantly increased the project's economic risk. Timeframes, spoil management activities and disturbance areas were also key considerations.

It was resolved that options 3 and 4 would proceed to the detailed assessment stage for selection of a preferred option for the project. This detailed assessment is summarised in **Section 3.2.7**.

Table 3-3 Summary table

Element	Option 3	Option 4	Option 5	Option 6	Option 8	Option 9
Area of vegetation clearance						
Within KNP (hectares)	185	74 (37 hectares fully cleared and 37 hectares partially cleared)	8	77	5	8
Outside KNP (hectares)	Nil	44 (34 hectares fully cleared and 10 hectares partially cleared)	27	33	35	4
Maximum disturbance total (hectares)	185 (not including HumeLink disturbance)	118 (71 hectares fully cleared, 47 partially cleared)	35	110	40	12
Other environmental considerations						
Visual amenity impacts	Potential low to high impacts resulting from taller structures in new easement adjacent to existing lines. Due to connection to UTSS, any network expansions would have to come into the KNP in the future. These lines would also have additional visual impacts.	Low to high visual impacts, given the new lines are not near existing electrical infrastructure and maintenance of easement.	Likely low impacts given the minimal surface infrastructure	Likely low to moderate visual impacts due to the required excavation works, particularly large cuts required within the KNP (O'Hares Track) and along the Elliot Way and maintenance of grassed easement. Visual impacts of reservoir bridge crossing if proposed.	Likely low to moderate visual impacts due to required excavation works and maintenance of grassed easement for trenched component.	Likely low to moderate impacts with permanent shipyards required to be built and barges stored for maintenance. Likely low to moderate visual impacts for trench component due to required excavation works and maintenance of grassed easement.

Element	Option 3	Option 4	Option 5	Option 6	Option 8	Option 9
Waste	Moderate volumes of spoil requiring disposal off site. Significant oil volumes in KNP due to substation location at UTSS.	Low volumes of spoil requiring disposal off site.	Moderate volumes of spoil requiring disposal off site.	High volumes of spoil requiring disposal off site.		Significant volumes of spoil and excavated materials (submerged trees and dredged material) requiring disposal off site.
Biodiversity	Approximately 142 hectares of Smoky Mouse (critically endangered species listed under NSW and Commonwealth legislation) habitat cleared with additional indirect impacts. This is a significant impact that is unlikely to be tolerable. Additional future network expansion impacts due to HumeLink KNP connection.	Requires clearing of native vegetation which provides habitat for threatened species though no significant impacts are predicted.	Disturbance footprint has been largely surveyed. Significant impacts to biodiversity are unlikely.	Potential biodiversity impacts (disturbance area not surveyed).	Potential biodiversity impacts (disturbance area not surveyed for trench component).	Potential biodiversity impacts (disturbance area not surveyed). Potentially significant impacts on the threatened Murray crayfish from dredging.

Element	Option 3	Option 4	Option 5	Option 6	Option 8	Option 9
Heritage	Potential Aboriginal and non-Aboriginal heritage impacts (disturbance area not surveyed).	Disturbance of three PADs, four Aboriginal heritage sites, one site of local heritage significance and five items with archaeological potential. No significant impacts to heritage are predicted.	Disturbance footprint has been largely surveyed. Significant impacts to Aboriginal heritage, and non-Aboriginal heritage are unlikely.	Potential Aboriginal and non-Aboriginal heritage impacts (disturbance area not surveyed).	Potential Aboriginal and non-Aboriginal heritage impacts (disturbance area not surveyed for trench component).	Potential Aboriginal and non- Aboriginal heritage impacts (disturbance area not surveyed).
Water	Erosion and sediment impacts during construction.	Potential interaction with groundwater. Groundwater information in the area is poorly understood. Unlikely to impact nearby groundwater users. Potential impacts to groundwater dependent ecosystems (GDEs). Erosion and sediment impacts during construction.	Erosion and sediment impacts during construction.	Potential interaction with groundwater for tunnel component. Groundwater information in the area is poorly understood. Unlikely to impact nearby groundwater users. Potential impacts to GDEs. Erosion and sediment impacts during construction.		Significant turbidity impacts due to dredging required. Likely downstream impacts to water users.

Element	Option 3	Option 4	Option 5	Option 6	Option 8	Option 9
Transport	**Temporary impacts on traffic and access during construction.**					
Spoil disposed of off-site cubic metres (m^3)	~ 500,000	~ 180,000	~ 770,000	~ 4,228,527	~ 1,750,000	Unable to quantify however likely to be in the range of several million m^3.
Other						
Cost* (million)	~ $450	$290	~ $1,393	~ $1,087	~ $1,304	Unable to quantify however likely to be >$1,000 million
Time (months)	57	45	82	74	78	N/A
Network resilience considerations including HumeLink connection	Worsens See Note 1	Improved See Note 2	Improved See Note 2	Improved See Note 2	Improved See Note 2	Worsens See Note 1

Note:

Additional assets and Snowy 2.0 connection at UTSS would lower system resilience when assessed using causal events (extreme weather and / or bushfire) due to worsened spatial and temporal factors in combination with the higher concentration of assets and localised power density. Threats at UTSS include loss of significant generation input capacity (2,660 MW and disruption of critical interconnection between Victoria and NSW (VNI1)). Threats with connection at LTSS are even higher with loss of extreme generation input capacity of 3,800 MW and similar disruption of critical interconnection between Victoria and NSW.

New assets and Snowy 2.0 connection at Maragle would increase system resilience when assessed using causal threats of extreme weather and / or bushfire due to improved spatial and temporal factors in combination with overall reduced concentration of assets and localised power density (relative to other proposed connection points at UTSS and LTSS). The choice of Maragle also creates a node on an alternative interconnection path to south-west NSW and Victoria relative to the existing single interconnection between Victoria and NSW. Threats at Maragle include loss of significant generation input capacity (2,000 MW) but avoids disruption of critical interconnection between Victoria and NSW.

3.2.7. Detailed assessment and selection of the preferred option

A detailed assessment of the remaining options (Option 3 and Option 4) was carried out against the evaluation criteria outlined in **Figure 3-2**. Each criterion was weighted equally to determine the preferred option for the project. Refer to section 9 of the Options Report provided in **Appendix D** for the detailed assessment of Option 3 and Option 4.

3.2.7.1. Option 3 – Overhead to Upper Tumut Switching Station

Network and connectivity

Option 3 meets the n-1 redundancy requirements increasing the resilience and reliability within the NEM. This option achieves connection for first power generation for Snowy 2.0, based on the project development connection date of 2017. However, Option 3 does not provide the required capacity for Snowy 2.0 generation delivery into the NEM unless HumeLink infrastructure is brought into KNP.

A new substation is required in the KNP along with future 500 kV lines for HumeLink.

Overall, this option does not adequately meet the required network and connectivity criteria.

Constructability and design

This option presents no significant constraints for constructability and design, given that:

- Suitable construction support sites are available at UTSS through Snowy 2.0 (although the topography may prove challenging in some areas)
- Overhead lines are susceptible to fault/damage but are cost effective to fix and allow for more straightforward maintenance.

Connection into the existing Line 2 was investigated by Transgrid. The single circuit for the existing Line 2 is fully utilised and cannot be used or combined with the transmission of Snowy 2.0. Any arrangement or use of Line 2 easement within Option 3 would need to maintain a single circuit for Line 2 and four circuits for Snowy 2.0.

It is also not possible to progressively replace the existing Line 2 to include the transmission of Snowy 2.0 generation to UTSS as Line 2 forms part of the existing Southern NSW 330 kV network.

Option 3 would take approximately five years to construct.

Economic factors

The cost of Option 3 is approximately $450 million. The construction costs for Option 3 are well in excess (in the order of 50% more) of those for Option 4. These costs are due to the length of line and the terrain. Operational costs are comparable to those of Option 4 due to the fact that damage to overhead transmission lines and structures are more cost effective to fix when compared to underground lines.

Community and environment

Option 3 would require the disturbance of approximately 185 hectares of vegetation within KNP. An additional 133 hectares of vegetation disturbance, 25 hectares within KNP, would be required to extend HumeLink from the proposed Maragle substation location to UTSS.

The majority of the footprint of Option 3 and the HumeLink extension hectares s not been surveyed, with the exception of the section of route between Lobs Hole cable yard and the existing Line 2 (which is identical for

both Options 3 and 4). However, the footprint contains known areas of habitat (80 hectares) for Smoky Mouse which is listed as critically endangered under the NSW *Biodiversity Conservation Act 2016* (BC Act) and endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Given the large areas of potential habitat disturbance, and its critically endangered status, there is high potential for significant impacts to this species.

Aboriginal heritage surveys have not been undertaken for the majority of the Option 3 route. Notwithstanding this, based on the distribution of Aboriginal heritage sites recorded for Snowy 2.0, impacts on sites are likely.

For Option 3, the following visual elements would occur within KNP:

- Approximately 16 kilometres of two x double circuit 330 kV transmission lines (total permanent easement width of approximately 120 to 140 metres), running from the Snowy 2.0 cable yard at Lobs Hole to Line 2, and then running adjacent along Line 2 to UTSS, with an estimated 106 transmission structures (53 pairs)
- Expansion of UTSS with an additional disturbance area of approximately 22 hectares
- Approximately 13.4 kilometres of single circuit 500 kV transmission lines (total additional permanent easement width of approximately 80 m), running from UTSS to the western edge of KNP for the future HumeLink project.
- Under Option 3, all other aspects of the future HumeLink project would occur outside of KNP.
- Option 3 would likely require the removal and disposal of approximately 500,000 m^3 of spoil.

Overall, Option 3 would result in significant additional infrastructure and associated environmental impacts within the KNP.

Best practice safety requirements

Option 3 is able to meet best practice safety requirements during construction and operation.

3.2.7.2. Option 4 – Overhead to Line 64

Network and connectivity

Option 4 meets the n-1 redundancy requirements increasing the resilience and reliability within the NEM. It also achieves connection for first power generation for Snowy 2.0.

Another benefit is that Option 4 is able to provide the required capacity for Snowy 2.0 generation delivery into the NEM, without the need for HumeLink infrastructure to be brought into KNP. A new substation in Bago State Forest and 500 kV transmission lines associated with the HumeLink are outside the KNP. Line 64 is also seen as a better connection point into the 330 kV network as it is part of a less constrained cutset than Line 1 or Line 2 and the line is of lesser consequence than Line 1 or Line 2.

Overall, this option has no significant network and connectivity constraints.

Constructability and design

Option 4 presents no significant constraints for constructability and design, given that:

- Suitable construction support sites are available at Lobs Hole and at the western extent at Line 64 through Snowy 2.0
- Overhead lines are susceptible to fault/damage but are cost effective to fix and allow for more straightforward maintenance

- Construction footprint would be small and would, therefore, result in a smaller disturbance footprint.

Option 4 would take just under four years to construct, meeting requirements to connect for first power generation for Snowy 2.0, which is shorter than the 5 years to construct Option 3.

Economic factors

The cost of Option 4 is approximately $290 million. This is $160 million less than the cost of Option 3.

The construction costs associated with Option 4 are considerably less than those of Option 3due to the short length of line and the terrain. Operation costs are also comparable to those of Option 3 due to the fact that damage to overhead transmission lines and structures are more cost effective to fix when compared to underground lines.

Community and environment

Option 4 would require the disturbance of approximately 118 hectares of vegetation. Of this, approximately 74 hectares would be within KNP which is significantly less than the disturbance required for Option 3, particularly within KNP.

Option 4 requires the clearing of native vegetation which provides habitat for threatened species. However, no significant impacts are predicted, including on Smoky Mouse. As stated above, Option 3 is likely to have a significant impact on Smoky Mouse.

Option 4 would disturb three potential archaeological deposits (PADs), three Aboriginal heritage sites, one site of local heritage significance and five items with archaeological potential. However, no significant impacts to heritage are predicted.

For Option 4, the only infrastructure required to be constructed in KNP includes approximately 8 kilometre of two x double circuit 330 kV transmission lines (total permanent easement width of approximately 120 to 140 m), running from the Snowy 2.0 cable yard at Lobs Hole to the western edge of KNP with 32 transmission structures (16 pairs). However, these transmission lines would need to be constructed in new easements and not adjacent to existing lines and easements like the Option 3.

Under Option 4, the 330/500 kV Maragle substation and HumeLink connections are located outside of KNP.

Option 4 is estimated to require the removal and disposal of approximately 180,000 m^3 of spoil which is less than the 500,000 m^3 of spoil required to be removed for Option 3.

While Option 4 would result in additional infrastructure and associated environmental impacts within the KNP, this infrastructure is significantly less than that required for Option 3. In addition, and as previously stated, the location of the Maragle substation and HumeLink connections outside of KNP for Option 4 removes the risk of future infrastructure being brought into the KNP to connect to the substation.

Best practice safety requirements

Option 4 is able to meet best practice safety requirements during construction and operation.

3.2.7.3. Comparison of Option 3 and Option 4

Table 3-4 summarises Option 3 and 4 with respect to the following characteristics:

- Area of vegetation clearing, including areas required for HumeLink connections which are additional to current corridor extent
- Environmental considerations, such as visual and biodiversity impacts
- Spoil quantity
- Estimated construction cost
- Estimated construction and approvals time
- Network resilience considerations including connection to HumeLink.

Table 3-4 Summary comparative analysis for Option 3 and 4

Element	Option 3 – Overhead to UTSS	Option 4 – Overhead to Line 64
Vegetation disturbance		
Within KNP	185 hectares plus HumeLink extension 25 ha	74 ha
Outside KNP	0 hectares plus HumeLink extension 108 ha	44 ha
Total	185 hectares plus HumeLink extension 133 ha	118ha
Other environmental considerations		
Visual amenity	Potential low to high impacts resulting from taller structures in new easement adjacent to existing lines. Due to connection to UTSS, any network expansions would have to come into the KNP in the future. These lines would also have additional visual impacts.	Low to high visual impacts given the new lines are not near existing electrical infrastructure and maintenance of easement.
Biodiversity	Approximately 80 hectares of Smoky Mouse (critically endangered species listed under NSW and Commonwealth legislation) habitat cleared with additional indirect impacts. This is a significant impact that is unlikely to be tolerable. Additional future network expansion impacts due to HumeLink KNP connection.	Requires clearing of native vegetation which provides habitat for threatened species though no significant impacts are predicted.
Heritage	Potential Aboriginal and non-Aboriginal heritage impacts (disturbance area not surveyed).	Disturbance of three PADs, four Aboriginal heritage site, one site of local heritage significance and five items with archaeological potential. No significant impacts to heritage are predicted.
Spoil quantity	~ 500,000 m^3	~ 180,000 m^3
Other		
Cost	~ $450 million	~ $290 million
Time	57 months	45 months

Element	Option 3 – Overhead to UTSS	Option 4 – Overhead to Line 64
Network resilience considerations including HumeLink connection	Worsens. Additional assets and Snowy 2.0 connection at UTSS would lower system resilience when assessed using causal events (extreme weather and/or bushfire) due to worsened spatial and temporal factors in combination with the higher concentration of assets and localised power density. Threats at UTSS include loss of significant generation input capacity (2,660 MW and disruption of critical interconnection between Victoria and NSW.	Improved. New assets and Snowy 2.0 connection at Maragle would increase system resilience when assessed using causal threats of extreme weather and/or bushfire due to improved spatial and temporal factors in combination with overall reduced concentration of assets and localised power density (relative to the two proposed alternative connection point options). The choice of Maragle also creates a node on an alternative interconnection path to south-west NSW and Victoria relative to the existing single interconnection between Victoria and NSW. Threats at Maragle include loss of significant generation input capacity (2,000 MW) but avoids disruption of critical interconnection between Victoria and NSW.

3.2.7.4. Preferred option

Table 3-5 summarises the outcomes of the comparative analysis for Option 3 and 4 for the project. In summary, a comparison of Options 3 and 4 concludes that they equally satisfy three out of the six network and connectivity criteria. Option 4 satisfies the remaining three criteria to a greater extent than Option 3.

Table 3-5 Outcomes of comparative analysis for Option 3 and 4

Evaluation criteria	Option 3	Option 4
Technical – network and connectivity		
Provide required capacity for Snowy 2.0 generation delivery into the NEM considering HumeLink cumulative infrastructure needs	✓	✓
Provide required connectivity to increase resilience and reliability of electricity within the NEM		✓
Meet network planning requirements for N-1 redundancy	✓	✓
Consistent with the *2020 Integrated System Plan* (AEMO, 2020) (ISP) and other Commonwealth and NSW strategic policy documents regarding NEM future needs		✓
Minimise need for additional infrastructure within KNP to further stabilise the network due to the project		✓
Reduce pressure on existing key links	✓	✓
Technical – constructability and design		
Minimise construction duration and risk		✓
Allow for suitable and efficient construction support sites close to alignment	✓	✓
Minimise excavation in areas of NOA		✓
Allow for suitable and efficient operational maintenance activities	✓	✓
Minimise scale of project's construction requirements that may result in heavy haulage movements on local area		✓
Environment and planning – economic factors		
Maximise cost efficiency		✓
Support current and future requirements of the NEM		✓

Evaluation criteria	Option 3	Option 4
Deliver positive economic benefits to the people of NSW		✓
Achieve connection for first power generation of Snowy 2.0	✓	✓
Minimise project economic risk		✓
Environment and planning – community and environment		
Minimise additional infrastructure within KNP		✓
Minimise impacts to environmentally and culturally sensitive sites		✓
Minimise long term visual impacts within KNP		✓
Maintain long term access and use of public open space and recreation areas within KNP	✓	✓
Minimise private property impacts and acquisition requirements	✓	✓
Minimise impacts and disruption to local community and businesses		✓
Minimise generation of spoil		✓
Safety		
Best practice safety requirements	✓	✓

Table 3-5 demonstrates Option 4 as the preferred option for the project as it:

- Would provide more support for the current and future requirements of the NEM, as it would:
  - Increase resilience and reliability within the NEM
  - Be more consistent with the ISP and other strategic policy documents regarding future NEM needs
  - Have a shorter construction duration resulting in reduced risks to connecting Snowy 2.0 to the NEM.
- Has less infrastructure overall and within KNP that would involve:
  - Less excavation in areas of NOA
  - Less impacts to environmentally sensitive sites, particularly Smoky Mouse habitat
  - Less long term visual impacts within KNP
  - Requires significantly less excavated spoil to be disposed.
- Would have less construction requirements and associated heavy vehicle movements that would impact the local community and businesses.
- Is the least cost option, therefore reducing the project economic risk.

Option 4 as the preferred project option (the project), consists of an overhead transmission connection connecting the Snowy 2.0 cable yard within KNP to Line 64 via a new substation within Bago State Forest. This option as 'the project' is the subject of the EIS, this Submissions Report and the Amendment Report.

3.3. Key project amendments since public exhibition

Following exhibition of the EIS, and in response to the issues raised in submissions, Transgrid identified amendments to the project as presented in the EIS. These amendments provide functional improvements to the design, confirm elements of the project that were highlighted as opportunities in the EIS, and take into account ongoing development of the construction methodology.

The amendments to the project since public exhibition are:

- A reduction to the disturbance area from approximately 143 hectares (ha) to approximately 125 hectares
- The inclusion of six distinct management zones within the reduced disturbance area
- Access track amendments including the introduction of an additional track and the realignment of another track in project area east to align with the equipment storage and laydown area adjacent to Transgrid's Ravine substation
- Increased substation footprint to accommodate a wider asset protection zone to meet compliance with *AS5339-2018 Construction of buildings in bushfire prone areas*
- Alternative spoil disposal within the approved Snowy 2.0 Main Works footprint to accommodate the disposal of spoil generated in project area east
- New water uptake sites to facilitate construction in project area west
- Removal of the helipad.

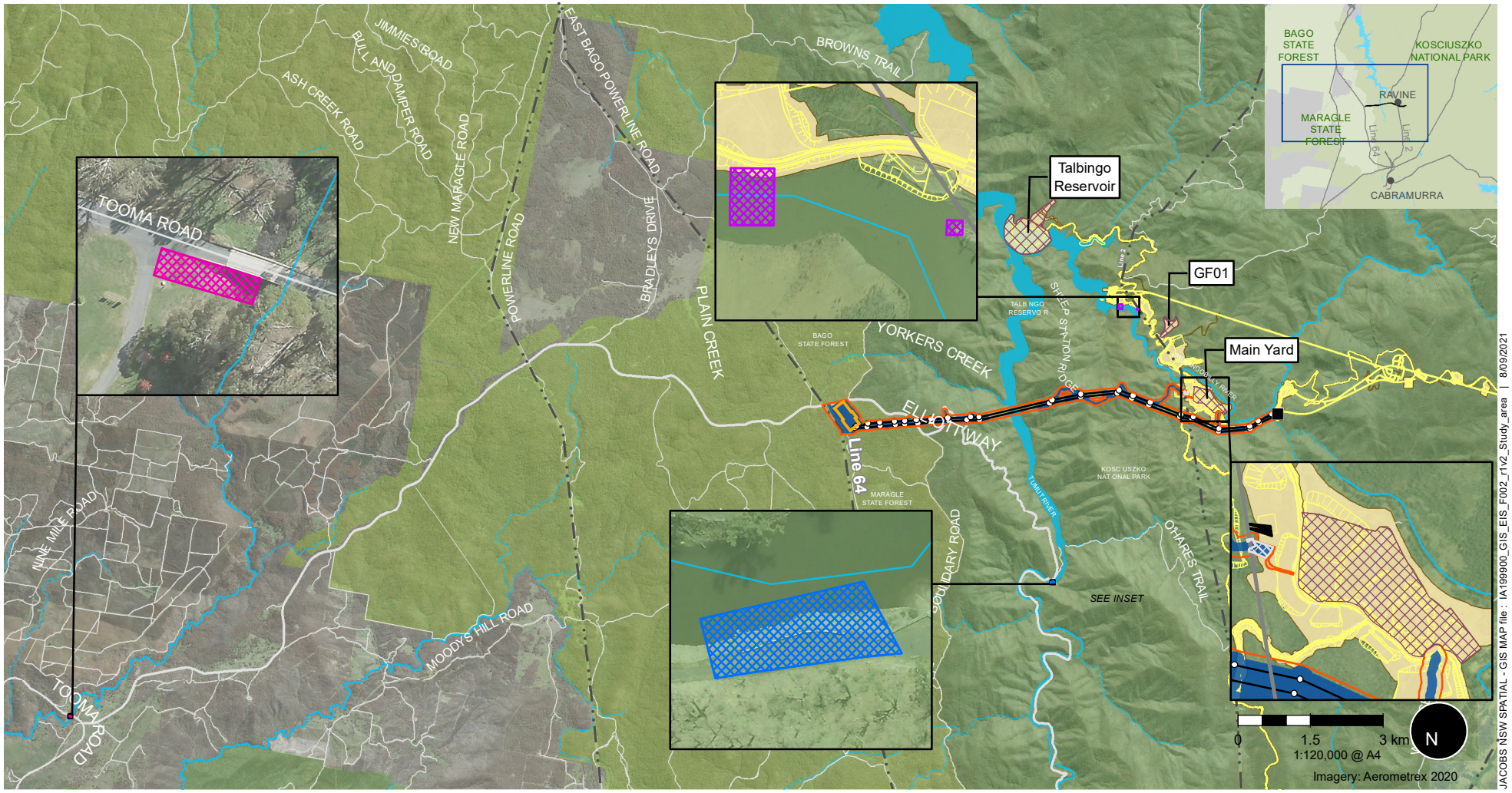
These project amendments are discussed further in the Amendment Report. The Amendment Report provides the full amended project description, project clarifications, additional environmental assessment carried out following exhibition of the EIS, and updated mitigation measures.

3.3.1. Amended project overview

The key elements of the amended project are shown on **Figure 3-4** and include:

- A new substation located within Bago State Forest and adjacent to Transgrid's existing Line 64, which forms a 330 kV connection between UTSS and LTSS. The substation would occupy a footprint of about 225 metres wide by 500 metres long, surrounded by an approximate 80 metre to 100 metre wide cleared APZ
- Upgrade and widening of an existing access road off Elliott Way to the substation including the construction of new driveways into the 330 kV and 500 kV switchyards
- Two new 330 kV overhead double-circuit transmission lines from the Snowy 2.0 cable yard to the new substation:
  - Total length of each line is approximately nine kilometres
  - Located in a transmission corridor ranging in width from approximately 120 metres to 150 metres inclusive of the mapped hazard tree zones
  - Each line would comprise approximately 21 steel lattice structures up to 75 metres in height.
- Short overhead 330 kV transmission line connection (approximately 300 metres in length) comprising both steel lattice structures and pole structures as required between the substation and Line 64
- Construction of approximately eight kilometres of new access tracks to the transmission structures, and upgrade to existing access tracks where required. The access tracks would remain following the completion of construction to service ongoing maintenance activities along the transmission lines
- Ancillary construction activities, including the establishment of tensioning and pulling sites for conductor and earth wire stringing, crane pads, site compounds and equipment laydown areas, water extraction and the transport and haulage of equipment and waste to and from the project area
- The accommodation of up to 20 construction workers at the Snowy 2.0 works accommodation at Lobs Hole with the remainder of the construction workforce being accommodated as required in the nearby townships of Tumbarumba, Talbingo, Tumut, Adaminaby, Providence Portal and Cooma.

The full amended project description is provided in Appendix A of the Amendment Report.



- Project area
- Disturbance area
- Proposed 500kV substation
- Proposed structure
- Proposed transmission line
- Site compound and equipment laydown area
- Paddys river water extraction
- Ravine intake
- T2 Tailbay water extraction
- Snowy 2.0 cable yard
- Snowy 2.0 element
- Emplacement Area
- Snowy 2.0 Disturbance footprint
- Electricity transmission line
- Waterway
- Water body
- State forest
- NPWS estate

Figure 3-4 Overview of the amended project

Data source:
Jacobs 2020, TransGrid, EMM 2020,
© Department Finance, Services and Innovation 2018

3.4. Further assessment of the impacts of the project

The majority of the impacts associated with the amended project are expected to be generally consistent with those presented in the EIS. Where the amended project was anticipated to have new or varied environmental impacts, however, these have been assessed, including impacts to biodiversity, Aboriginal heritage, water, transport, visual impacts, and noise.

A revised BDAR and AACHAR have also been prepared in response to agency submissions and also assesses the amended project.

These further assessments are summarised in Chapter 6 of the Amendment Report and the revised BDAR and AACHAR are provided as appendices to the Amendment Report.

4. Response to submissions

This section provides a summary of the issue types raised in all of the government agencies, organisations and community submissions and provides a response to the issues raised.

The full submissions can be accessed on the DPE Major Projects website (www.planningportal.nsw.gov.au/major-projects). Each community submitter has been allocated an individual submitter ID from DPE. **Appendix B** lists the community submitter IDs and provides a reference to where the issues raised are responded to in this Submissions Report.

The issues raised were summarised and grouped according to the categorises identified in **Table 2-2**, with responses provided in this chapter according to the key issues and sub-issues identified.

Each key issue identified in **Chapter 4** is presented as a summary of the issues raised in the submissions. This means that, while the exact wording of a particular submission may not be quoted, the substance of the issues raised are captured in the summary of the key issue. Transgrid's response to each key issue is structured according to the various sub-issues identified in **Table 2-2**.

4.1. The project

The majority of the submissions received related to alternatives and options, and in particular challenged the overhead transmission line as the preferred option and sought further information on alternatives to an overhead transmission connection.

Other issues raised in submissions concerned the project elements particularly around access tracks, waterway crossings, construction methods and rehabilitation, and the construction method.

These key issues are responded to below.

4.1.1. Alternatives and options

Submissions received regarding the alternatives and options raised the following concerns:

- The transmission connection should be underground
- Any new transmission lines in KNP should be located underground
- A lack of feasible alternatives to connect Snowy 2.0 considered including alternative connection options for the project
- The scale of the overhead option is too large. Two 330kV circuits on a single set of structures would be sufficient
- An over canopy design with no vegetation clearing would be a better option for the project. NPA suggested that this could be achieved by two higher capacity circuits on one set of (possibly taller) structures, of a less intrusive design, strung over the uncleared bush canopy, constructed and maintained by helicopters and drones, with no access tracks
- Concerns regarding the lack of analysis demonstrating alternative solutions were developed and considered prior to the selection of the preferred option, which included availability of:
    - Alternative locations to connect to the broader NEM
    - Different methods of transmitting electricity generated from Snowy 2.0 to the NEM.

Responses to these matters are provided below.

4.1.1.1. Options assessment process

Transgrid followed the appropriate requirements of an options assessment for preparing an EIS as stipulated in Schedule 2 of the EP&A Regulation. Early optioneering work carried out by both Transgrid and Snowy Hydro determined that an overhead connection to Line 64 was the optimal solution balancing technical feasibility, cost and environmental impacts. This led to the scoping report being submitted to DPE based on an overhead connection and subsequently, SEARs were issued on that basis. At that time, DPE did not question this design approach. The outcomes of the early options assessment work were captured in the EIS and sufficiently satisfied the SEARs in relation to this matter.

The EIS considered several project options to determine the optimal solution to meet the transmission connection objectives. During this process, options were considered for the:

- Substation location and connection point
- Type of connection such as underground and overhead
- Transmission route selection.

The options assessment in the EIS concluded that the preferred project option consists of an overhead transmission connection that connects the Snowy 2.0 cable yard within KNP to Line 64 via a new substation located within Bago State Forest.

Since exhibition of the EIS and following comments received in the submissions, Transgrid commissioned a comprehensive review and further analysis of the options included in the EIS as well as other potential and feasible options that may be considered instead of the base case overhead transmission lines option based on the submissions received.

The further options assessment and analysis carried out since the display of the EIS is documented in the Options Report which is provided in **Appendix D** and summarised in **Section 3.2**. The intent of the Options Report was to confirm and revisit the options assessment presented in the EIS and consider and assess alternative options put forward in the submissions received. The Options Report supports the options assessment findings included in the EIS, that the preferred project option is an overhead transmission connection connecting the Snowy 2.0 cable yard within KNP to Line 64 via a new substation located within Bago State Forest.

4.1.1.2. Alternatives

As described in **Section 3.2**, and documented in the Options Report, 12 options were identified based on various combinations of alternative connection points and transmission methods.

The alternative connection points include connection to existing transmission assets as follows:

- 330 kV transmission lines, being Line 1, Line 2 and Line 64
- Switching stations being UTSS and LTSS.

While the alternative transmission methods include:

- Overhead transmission lines
- Cables within tunnels
- Cables within trenches
- Submarine cables
- A combination of the above.

Consideration of whether the project should be underground

Underground transmission of power requires consideration of different design and constructability factors than those that apply to overhead transmission.

For example, construction costs for underground transmission are substantially higher than overhead transmission due to the higher amounts of civil works (materials, equipment and labour) required and the cable types and installation requirements to achieve the required thermal rating. In addition, the suitability and feasibility of underground transmission is highly dependent on ground conditions and the immediate environment near the transmission lines themselves.

As summarised in **Section 3.2**, the Options Report considered seven underground transmission options to alternative connection points such as to Line 64 and LTSS.

Of the three underground transmission options (Options 9, Option 10 and Option 12) to connect to LTSS, none of the options would enhance the resilience and reliability of the NEM. In addition, Option 9 was assessed not to be technically viable because of the required construction methodology within Talbingo Reservoir and the construction schedule. Option 9 would also likely have significant environmental impacts associated with dredging within the Talbingo Reservoir.

The steep terrain between the Snowy 2.0 cable yard and Line 64 poses challenges to implementing underground transmission options (Option 5, Option 6 and Option 7). Option 7 was assessed not to be technically viable because it is unsuitable for steep terrain, has a high probability of tunnel drift during drilling and also requires the transition to overhead transmission over Talbingo Reservoir.

As a result of the screening assessment and at the request of the DPE, four of the underground transmission options (Option 5, Option 6, Options 8 and Option 9) were considered further as part of the post screening assessment, refer to **Section 3.2.6**. Option 5, Option 6 Option 8 and Option 9 did not proceed to a detailed assessment as, primarily, they did not meet the evaluation criteria relating to economic factors (and Option 9 was not technically viable). Specifically these options significantly increased the project's economic risk as the costs are up to five times higher than the base case (Option 4). Impacts to timeframes and size of disturbance areas were also a key consideration. Therefore, no underground or hybrid options were considered in the detailed assessment of alternative options as summarised in **Section 3.2.7**.

Table 4-1 provides a comparison of the underground options considered further (Option 5, Option 6, Options 8 and Option 9) in the options assessment and analysis and the preferred option (Option 4). The full option comparison is provided in **Table 3-3**.

The options assessment and analysis documented in the Options Report clearly demonstrates that Option 4, which is an overhead connection to a new substation, located adjacent to Line 64, is the preferred option as it is the optimal solution which balances technical feasibility, cost and environmental impacts.

Table 4-1 Comparison of underground options considered further in the options assessment and analysis

Element	Options				
	5	6	8	9	4 (the preferred option)
Vegetation removal (hectares)	35	118	40	12	125
Spoil disposed of off-site (m^3)	770,000	~ 4,228,527	1,750,000	Unable to quantify, however likely to be in the range of several million m^3.	~ 180,000
Cost* (million)	~ $1,393	$1,087	~ $1,304	Unable to quantify however likely to be >$1,000 million	$290
Time (months)	82	74	78	N/A	45

The scale of the project

Given the criticality of the power generation from Snowy 2.0 to the stability and energy security and reliability for the NEM, a key design objective is to minimise the risk of losing the ability to transmit this power to consumers.

Electricity network reliability standards govern how network infrastructure is designed, built and operated to avoid or manage interruptions to electricity supply. The level of redundancy specifies the number of backup arrangements (either 1, 2, or 3) that must be in place to support continued supply of electricity in the event that part of the transmission network fails. The redundancy standard for Snowy 2.0 generation that Transgrid is required to comply with, as set by the Independent Pricing and Regulatory Tribunal (IPART) and as directed by the NSW Government, is n-1(i.e. one backup arrangement).

The full generation of 2,000 MW from Snowy 2.0 results in a total power transfer requirement of 2,550 Megavolt amperes (MVA). Using the largest conductor size for 330 kV cables in use in the Australian market, this equates to a minimum of four circuits, with each circuit rated at 850 MVA, allowing for the n-1 redundancy standard (i.e. full power transfer is still possible in the event one circuit fails). Meaning that four circuits (4 x 850 MVA = 3,400 MVA) under the n-1 redundancy scenario (i.e. one circuit failing) still transmit the full power of 2,000 MW to the market through the three remaining circuits (3 x 850 MVA = 2,550 MVA).

If Snowy 2.0 supplies the loads via two sets of double circuit lines with normal conductors, a multiple contingency event (failure of both circuits) on one of these sets of lines will likely result in a reduction of up to 400 MW Snowy 2.0 generation or pumping at that point of time, while the remaining set of double circuit lines will continue to transfer about 1,600 MW power. It is expected that this will mean that the network will remain stable with the generation gap able to be managed by re-dispatching generation in the other part of the network. Forced or planned outages on one line/circuit is also unlikely to constrain generation or pumping load from Snowy 2.0 given the n-1 redundancy.

An alternative, as suggested in a submission, is that a single set of double circuit lines with high-capacity conductors could be used to transmit Snowy 2.0 energy generation to the market. In that case, a multiple contingency event (both circuits) on this section would result in an instantaneous loss of up to 2,000 MW Snowy 2.0 generation or pumping at that point of time. This is because the connection is in the radial

configuration (meaning there is only one source of power transmission) and there is no other flow path for Snowy 2.0 generation during the outage.

Under this single set of double circuit lines scenario, this generation loss will be larger than the current largest generator in the NEM and could lead to widespread loss of supply and load including the possibility of cascading tripping and system blackout. In addition, in the event of forced or planned outage of one circuit, Snowy 2.0 generation is required to manage large generator trip events to be limited to about 750 MW and the pumping load to manage large load trip events would be limited to about 400 MW.

For these reasons, a single set of double circuit lines with high capacity conductors is an inferior solution to that proposed by the project.

Over canopy design

The EIS considered but rejected an over canopy transmission connection design which would use taller structures with the transmission lines strung high above the canopy with minimal easement clearing (refer to Section 3.2.4 of the EIS). However, this was assessed to not be feasible due to the unacceptable level of bushfire risk imposed by the large quantity of underlying fuel load in close proximity to the overhead transmission lines. As the amount of vegetation under the transmission lines increase, the risk of a bushfire causing a catastrophic failure of all four 330 kV circuits also increases. In the event that a bushfire causes a catastrophic failure of all four 330 kV circuits, Snowy 2.0 could be restricted from generating any of its 2,000 MW of power for months. This could have a significant impact upon Snowy Hydro due to loss of generation and introduce significant constraints to the NEM due to loss of availability of the 2,000 MW. The ability for Transgrid to respond to a catastrophic failure would also become more difficult as the vegetation under the transmission lines would impede the ability to traverse the easement if required for urgent repairs. For these reasons it was considered preferable to have a cleared easement for responding to a catastrophic failure of the transmission lines.

The typical easement arrangement provides a suitable level of mitigation for this risk. It should be noted that transmission lines over canopy in Queensland are built over rainforest and hence have a much lower bushfire risk profile than the plant community types present within the project area and broader locality.

Transmission route options

During the development of the project, Transgrid assessed a range of connection points to Transgrid's existing assets within the locality including, Line 64, UTSS, LTSS, Line 1 and Line 2.

UTSS, LTSS, Line 1 and Line 2 connection points had the following constraints:

- A connection point at LTSS imposes network stability risks associated with the high concentration of existing assets in that area of the network
- A connection point at UTSS has the same issues as the connection point at LTSS, but to a lesser extent
- Line 1 avoids the network stability risks associated with the high concentration of existing assets in the same locality but would involve a significant amount of new infrastructure within KNP including future HumeLink 500kV infrastructure. This is the key reason that connection to Line 1 was not progressed
- Line 2 had the same issues as Line 1, with a new substation at lobs Hole/Ravine and future 500kV assets associated with HumeLink needing to enter KNP.

Therefore, Line 64 was chosen as the preferred connection point and the location of the substation as it presents the least potential impact to KNP, and the HumeLink 500 kV transmission lines would be located outside of KNP in their entirety. This connection point to Line 64 also has the following advantages:

- It appropriately addresses network risk and stability issues due to its route diverse location
- The substation site would have the benefits of being located on the plateau, characterised by flat terrain and accessible via the existing sealed road network (Elliott Way)
- Line 64's location is also the shortest point from any of the potential connection points to the Snowy 2.0 cable yard, therefore minimising the project footprint.

The options assessment and analysis as documented in the Options Report considered five options (Option 4, Option 5, Option 6, Option 7 and Option 8) that connect into Line 64. As summarised in **Section 3.2**, of the five options that connect into Line 64, only Option 4 was progressed to the detailed assessment. The other options did not meet the objectives or they exceeded threshold issues relating to the assessment criteria. As such, these options were eliminated in the screening process.

It is noted that Option 3, which is an overhead to UTSS was considered in the detailed assessment (refer to **Section 3.2.7**), at the request of DPE. That assessment concluded that Option 4 was the optimal solution, and therefore the preferred solution. Option 4 keeps as much infrastructure out of KNP as possible, including the new substation which would support the future 500 kV transmission line augmentations to Transgrid's network (HumeLink). The new substation location within Bago State Forest, as the connection point to Line 64, has been located close to the Elliot Way to reduce new access road construction and as directly west from Lobs Hole as possible to reduce the length of the transmission connection as much as possible. Also the location of the new substation provides a reasonable separation from UTSS, LTSS and the existing Southern NSW 330 kV network which would help improve the level of resilience in this part of the NEM.

Option 4 is the same as the project proposed and assessed in the EIS, refer to **Section 3.2** and the Options Report provide in **Appendix D**.

Alternative structure design

The Supplementary LCVIA was prepared to consider visual impact mitigation measures available for the project. The Supplementary LCVIA discussed the use of alternative structures such as steel monopoles (monopoles). The Supplementary LCVIA is provided in **Appendix E** and the potential mitigation measures available for the project are discussed in **Section 4.3.8.**

Compared to the steel lattice structure design, an overhead transmission connection with monopole supporting structures is expected to have a larger impact area. This is due to the size of the pole segments, requirement for deeper footings and loading requirements as explained below.

Given, the length of the pole segments in the monopole design, larger and longer trucks would be required to transport the steel segments to site. Additionally larger cranes would also be required for structure assembly, which would necessitate larger construction benches. In comparison, the lattice structures, are made up of smaller components and can be assembled on site. To accommodate the requirement for larger trucks and cranes, wider access tracks and reduced grades would be required for the monopole. The requirement for lower grade access tracks would result in an increased length of the access track route to the structure locations compared to the steel lattice structure design. Longer access tracks also have the potential to contribute to increased spoil generation.

Larger and deeper footings would also be required to support a monopole design, contributing to increased excavation and spoil generation compared to the lattice structures. It is expected the monopoles would require a multi pile and cap type foundation when compared to the steel lattice structures which only require piles. The size of the pile cap for monopoles could be in the range of approximately five meters x five meters and approximately four meters deep. Given the requirement for larger footings under a monopole design,

increased truck movements would also be expected as part of the delivery of concrete to the structure locations and removal of spoil from the works sites.

It should be noted that the comparison of impacts with respect to spoil generation and disturbance footprints between the monopole and lattice structure design is based on a high level qualitative assessment. To more accurately quantify the impact of monopoles, a full re-design of access tracks, construction pads and engineering and loading requirements of the monopoles would be required. Predicted impacts could be further exacerbated if more than one monopole is required to replace a single lattice structure in locations where the structure would be under high loading. A full engineering assessment and line modelling would need to be carried out to determine which locations would require more than one monopole to replace a single lattice structure.

4.1.2. Project elements

Comments raised in submissions regarding the project elements were as follows:

- The stormwater and contamination management at the substation site is unclear
- The unauthorised use of access tracks by third parties may cause erosion issues
- The waterway crossing at Sheep Station Creek should be a bridge
- Stream crossing design and works near or within watercourses to protect water quality and function should be in accordance with referenced guidelines
- Request for further details on rehabilitation and ongoing maintenance, including:
    - Ongoing maintenance of the easement at Transgrid's cost is required. This includes the timely removal of trees and vegetation that encroach within the safety zone of the transmission infrastructure
    - Transgrid needs to be the company responsible for clearing and maintenance of the project
    - The rehabilitation plan must be agreed with FCNSW, and subsequent works completed prior to rehabilitation equipment leaving the site
- Rehabilitation of the substation surrounds and the easement must be planned and funded by Transgrid.

Responses to these matters are provided below. Further details on water management, rehabilitation and ongoing maintenance measures are provided in Section 3.3 of the Amendment Report.

4.1.2.1. The substation

Stormwater and contamination management at the substation

The oil containment and stormwater management systems for the substation would be designed in accordance with Transgrid's Substation Oil Containment Procedure (Transgrid 2020) and Substation Design Manual – Civil & Structures (Transgrid 2020).

As described in the EIS, an impervious surface and oil containment system would be installed as part of the substation development for the major oil containing equipment and the on-site stormwater drainage system would allow stormwater flows from the site to be diverted appropriately away from the switchyard.

Further details of the water management at the substation (including spill containment) are provided in Section 3.2.1 of the Amendment Report.

4.1.2.2. Ancillary infrastructure

Access tracks

The access tracks to the transmission easement would include measures such as gates or bollards to prevent unauthorised vehicle access into Bago State Forest and KNP, particularly up Sheep Station Ridge. The gates or bollards would be installed in consultation with NPWS and FCNSW to prevent unauthorised vehicle access to the access track thereby reducing erosion issues with additional vehicle movements.

Waterway crossings

As stated in the EIS, a new waterway crossing would be required at Sheep Station Creek for the access track in this location.

Sheep Station Creek is an ephemeral third order stream which drains to the Yarrangobilly River (when flowing). The aquatic habitat includes gravel beds and undercut banks and the creek is mapped as key fish habitat (KFH).

The Sheep Station Creek crossing would most likely be a small bridge or box culvert that would be designed and constructed in a manner that would not impede stream flow or restrict fish passage. DPI - Fisheries would be consulted as part of the Sheep Station crossing design and it would be designed, constructed and maintained in accordance with the requirements of the *Guidelines for Controlled Activities on Waterfront Land (Natural Resources Access Regulator* (NRAR) 2018). In addition, the waterway crossings would be designed to protect water quality and function such as through appropriate measures as outlined in:

- *Why do fish need to cross the road? Fish passage requirements for waterway crossings* (Fairfull and Witheridge, 2003)
- *Forest Soil and Water Protection – A Guide for Operators* (State Forests of NSW, 2000)
- *Fire Trail Design, Construction and Maintenance Manual* (NSW Rural Fire Service (RFS), 2017).

The waterway crossing at Sheep Station Creek would also be designed and constructed in a way that minimises flood risk and upstream and downstream impacts. The waterway crossing would be designed to ensure flow and drainage is maintained in waterways where construction works are taking place or where the permeant waterway crossing would be located. These requirement for the waterway crossing are captured in the mitigation measures provided in Appendix B of the Amendment Report.

The access track over the new waterway crossing would be fitted with a permanent gate to manage access to Sheep Station Ridge post construction.

4.1.2.3. Rehabilitation

The rehabilitation activities would align with the overarching phases with key activities to be carried out both during and post construction as outlined in the Rehabilitation Strategy provided in Section 5.4.10 of the EIS. The Rehabilitation Strategy would form the basis of the rehabilitation plan which would be prepared to guide the long-term rehabilitation of applicable parts of the project area where permanent infrastructure and management (i.e. clearing under transmission lines) is not required. The rehabilitation plan would be developed in consultation with NPWS and FCNSW and to their satisfaction prior to construction. The rehabilitation plan would be consistent, where relevant, with the approved Snowy 2.0 rehabilitation management plan.

Measures in the rehabilitation plan will focus on preventing soil erosion and weed establishment in areas disturbed by the project as well as re-seeding of disturbed area using native species under consultation with NPWS and FCNSW. The rehabilitation plan will also include a program for monitoring and reporting on the success or impact of rehabilitation activities. The rehabilitation plan will also include a program for adaptive monitoring of specific success measures and reporting, and include a Trigger Action Response Plan (TARP).

Following construction, all temporary infrastructure such as equipment laydown areas and site compounds would be decommissioned and removed from site and the disturbed areas which would not be subject to future disturbance would be rehabilitated as soon as possible, in accordance with the rehabilitation plan.

As part of the vegetation clearing methodology (refer to Section 3.3.5 of the Amendment Report), where vegetation is removed by an excavator-mulcher method (outside civil/construction areas), mulched material would be evenly spread on bare, disturbed or exposed areas (to no greater than 50 millimetres in depth) to assist in protection of the soil. The mulched material may also be used for erosion and sediment control and stabilisation of disturbed areas during and post construction rehabilitation. No mulch would be stockpiled within the easement clearing zone (ECZ).

Post construction, any salvaged topsoil that does not contain significant weed loads would be respread over disturbed areas and soil protected from erosion by installing mulch and being stabilised and revegetated in accordance with the approved rehabilitation plan.

Post access track construction, the areas external to the operational access tracks including the batters would be stabilised and revegetated in accordance with the approved rehabilitation plan.

4.1.2.4. Ongoing maintenance during operation

During operation of the project, the substation and transmission connection would be inspected by field staff on a regular basis. As described in Section 5.5 of the EIS, the main activities include the regular inspection and maintenance of the infrastructure including the substation, transmission structures, foundation, fittings, transmission lines and the maintenance of the easement.

Ensuring the clearances are achieved is critical in managing the risk of bushfire, ensuring public safety, and maintaining system reliability. All vegetation maintenance activities would be carried out by Transgrid or their contractor and funded by Transgrid.

Full details of the ongoing operation and maintenance of the project, including vegetation management within each of the six management zones is provided in Section 3.3.5 of the Amendment Report.

However, given that concerns were raised in submissions about the operational maintenance for the substation, easement and access track, these measures are summarised below.

Operation maintenance for the easement (ECZ and HTZ)

Management of the easement (ECZ and HTZ) would be largely determined by the classification of the easement as per the vegetation risk model and operational vegetation clearance requirements (VCR) documented in Transgrid's *Maintenance Plan – Easement and Access Tracks* (Transgrid, 2020b), based on the expected yearly vegetation growth. The vegetation clearing requirements and methodology would be detailed in an operational vegetation management plan. The management of vegetation would occur on a cyclic basis, which would be determined by the vegetation response growth rate once this has been established. Based on Transgrid's existing transmission assets in the local region, the cyclic management period is expected to be four to six years.

Typical integrated vegetation management methods used during vegetation management cycles for the project would potentially include:

- Selective removal of tall growing species by hand cutting and herbicide application
- Selective removal of tall growing species by herbicide application (foliar spraying)
- Pruning or removal of mature trees that encroach on safe electrical clearances in accordance with the Australian Standard AS4373-2007 Pruning of Amenity Trees
- Slashing/mulching in areas of low conductor to ground clearance to mitigate flashover and bushfire risks posed by tall growing and mid-storey vegetation
- Slashing/mulching limited areas to provide safe access and egress to works areas within the easement.

In addition to the cyclic vegetation management within the ECZ, LiDAR would also be performed on the transmission connection once per year to identify potential vegetation intrusions (hazard trees). Any off-easement hazard trees within the HTZ, identified as part of the annual LiDAR inspection would be individually inspected by a suitably qualified arborist. Any easement intrusion within the safe clearance limit (i.e. the VCR) would be managed in accordance with the methods outlined in Section 3.2.5 of the Amendment Report.

Operation maintenance for the substation

Operationally, the management of vegetation for the substation would be required on the substation access road and within the APZ. Other areas would be cleared for the permanent infrastructure.

The operational maintenance for the substation access road and APZ would include slashing or mulching of the road verge and any road surface or drainage maintenance as required.

The vegetation in the APZ would be managed so that maintenance can be carried out by either slashing or mulching. Any trees within the APZ would be removed to ground level retaining the root systems and the ground layer. Other vegetation would be managed to a height of approximately 100 millimetres.

Operation maintenance for the access tracks

Routine vegetation maintenance would be carried out along the access tracks. This would generally involve maintenance, repair or reinstatement of damaged/eroded track surfaces/drainage and slashing/mulching of the track sides (to one to two metres) and/or manual pruning of tree branches which encroach the access track and prevent safe vehicle passage.

4.1.3. Construction Method

Submissions received on construction methods including activities and resources included:

- Clarification on the location and extent of any disturbance area required for construction within KNP not already identified in the EIS
- Further details on vegetation clearing, sediment and erosion control, spoil management (including emplacement and the consideration of alternatives to emplacement) and exclusion zones over Talbingo Reservoir. The use of tree pushers tends to create large areas of soil disturbance, especially root balls. A tree harvester is a more cost-effective, safer, and environmentally appropriate machine to use to clear standing timber
- Any dewatering activities must achieve the WQOs set for the project and that sufficient entitlement are in place to account for any water take
- Confirmation that the quantity of water required for construction is available.

Responses to these matters are summarised below. Further details on construction activities such as spoil management, erosion and sediment control, vegetation clearing and works above Talbingo reservoir and Elliott Way and traffic movements along Elliott Way are provided in Section 3 and Appendix A of the Amendment Report.

4.1.3.1. Activities

Disturbance area

For the purposes of identifying and assessing environmental impacts of the project in the EIS, a **disturbance area** was defined. The disturbance area encompasses the extent of physical disturbance likely to be required to accommodate construction activities and infrastructure needed to build the overhead transmission line, the substation, access tracks and vegetation clearing along the transmission corridor. The total disturbance area in the EIS was about 143 hectares; this includes about 43 hectares in Bago State Forest and about 100 hectares in KNP.

A broader **project area** has also been defined. The project area represents the limits within which the disturbance area may occur during construction to allow for flexibility for the final siting of project infrastructure. Final siting of the infrastructure (i.e. the disturbance area) can move within the assessed project area subject to recommended environmental management measures and provided it does not exceed the limits defined by the project area. The total project area in the EIS was about 259 hectares; this includes 63.8 hectares in Bago State Forest and 195.2 hectares in KNP.

As part of the project amendments, the disturbance area has been reduced to minimise the impacts of the project. The total disturbance area is now approximately 125 hectares; this includes approximately 44 hectares in Bago State Forest and about 81 hectares in KNP. All of the direct impacts associated with the project would be within the updated disturbance area.

The reduced disturbance area for the project is now made up of six distinct management zones as shown in **Figure 4-1.** Each of the six management zones would be subject to specific clearing requirements as part of the initial construction of the project and during ongoing operational maintenance of the project.

The six management zones are:

- Transmission structure zone (TSZ)
- Tensioning and pulling zone (TPZ)
- Access track zone (ATZ)
- Substation zone (SZ)
- Easement clearing zone (ECZ)
- Off easement hazard tree zone (HTZ).

Four of the management zones (TSZ, TPZ, ATZ and SZ) would require full clearing of the zone, while two management zones (ECZ and HTZ) would require partial clearing, refer to **Figure 4-1**.

The vegetation clearing in each of these six management zones is described further below and in Section 3.2.4.1 of the Amendment Report.

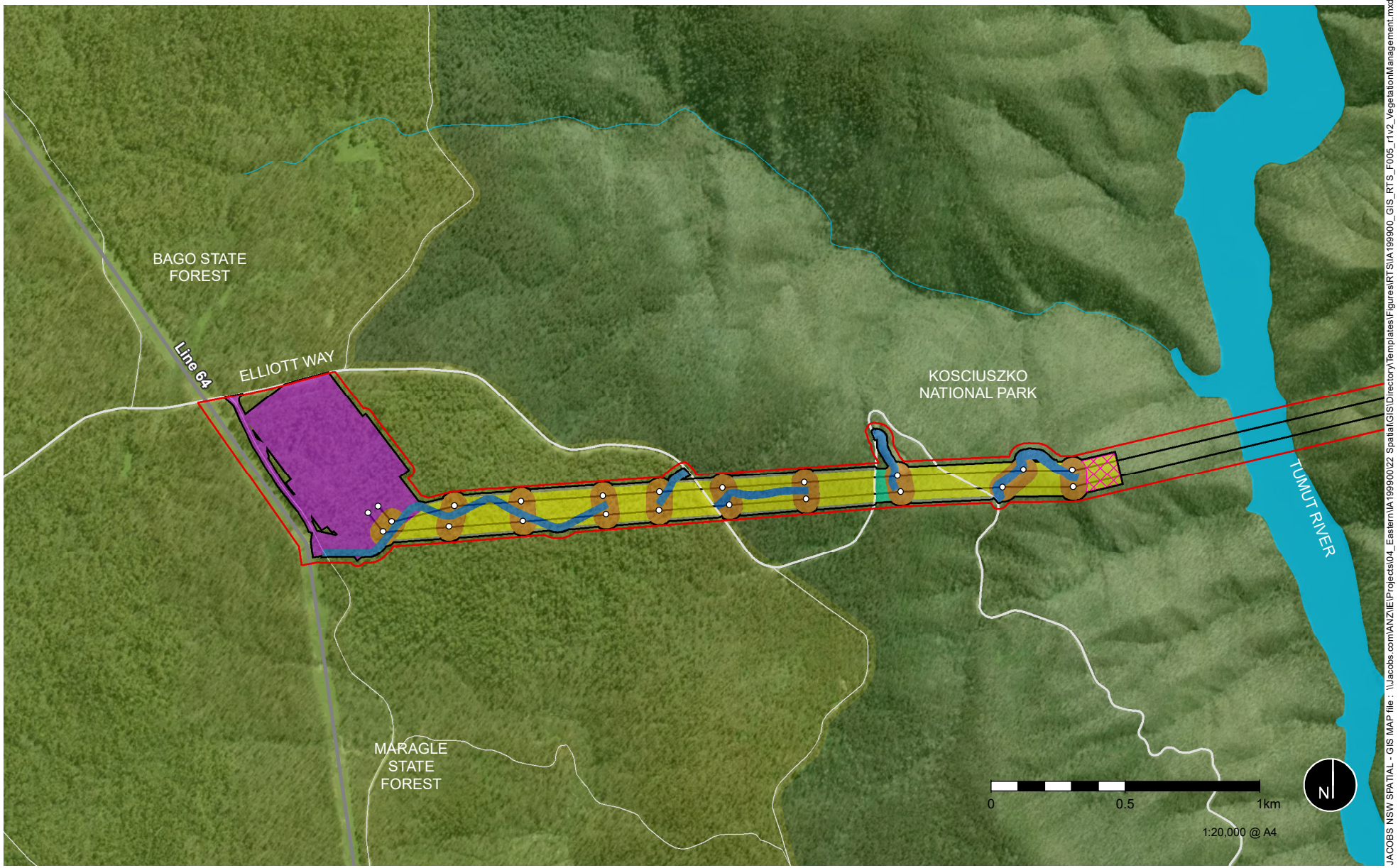


Figure 4-1 | Management zones within the disturbance area

Data source:
Jacobs 2021, TransGrid, EMM 2021,
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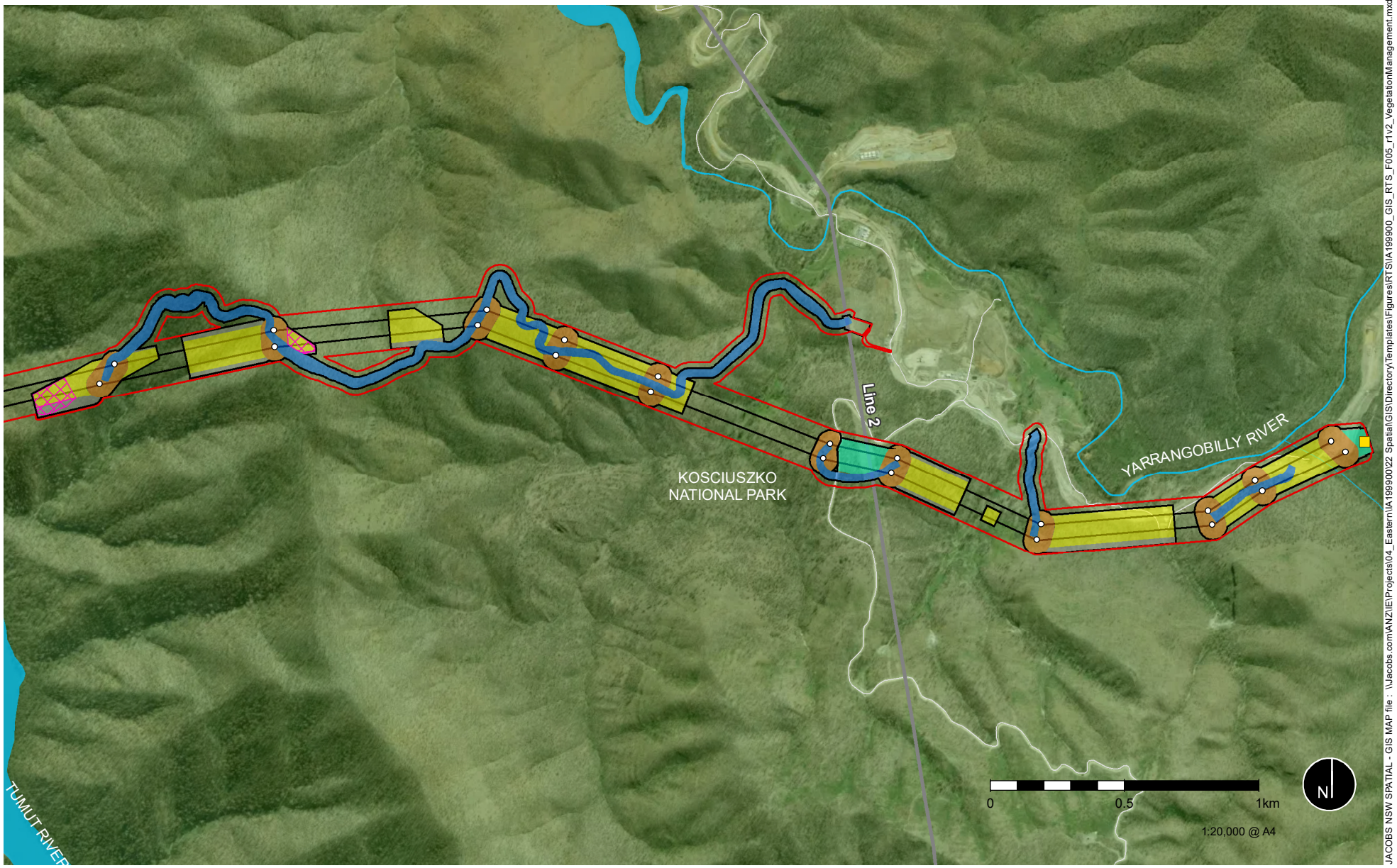

Figure 4-1 | Management zones within the disturbance area

Data source:
Jacobs 2021, TransGrid, EMM 2021,
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Vegetation clearing

It is expected that the amended project would result in direct impacts to about 118.3 hectares of native vegetation within the reduced disturbance area. This is about a 13% reduction in the overall area impacted from that predicted in the BDAR exhibited with the EIS (Jacobs, 2021).

The vegetation clearing procedures would include provisions for FCNSW to take possession and remove off-site any felled timber within Bago State Forest that FCNSW determine can be repurposed.

A summary of the vegetation clearing method and potential impact during construction is summarised in **Table 4-2**. A detailed description of the vegetation clearing methodology for construction and operation (including maintenance) in each of the six management zones within the disturbance area is provided in Section 3.2.4 of the Amendment Report. This methodology was developed in consultation with NPWS and FCNSW.

Transgrid acknowledges that the use of tree harvesters compared to other clearing equipment such as tree pushers would reduce disturbance to the underlying soil therefore retaining ground stability and reducing the risk of erosion. As such, a tree harvester would be the primary method of vegetation clearing where the complete removal of the root systems is not required. Tree pushers would be used for the complete removal of the root systems where civil works are required such as in the SZ and TSZ.

Table 4-2 Summary of vegetation clearing method and potential impact during construction

Clearing extent	Management zone	Clearing method	Predicted impact on growth forms
Full Clearing Areas	SZ	Mechanical vegetation clearing methods would be employed to completely remove vegetation down to bare earth. In areas subject to civil works (such as construction benches, structure footings, access track surface, substation bench), complete removal of the root balls would be required. As such, a tree pusher would typically be used in these areas. Removed trees would be passed through a tub grinder with the material then re-used for erosion and sediment control and stabilisation of disturbed areas during and post construction rehabilitation. In the areas where civil works is not required, a forest harvester or excavator-mulcher would be used. Mulched material would be evenly spread on bare, disturbed, or exposed areas to assist in protection of the soil. Where low growing vegetation, grasses or ground cover exists, care would be taken to avoid excess debris build up/smothering as to promote regeneration of the grass layer.	For the purpose of the revised BDAR and calculation of impacts, these areas subject to complete clearing would be assessed accordingly with the future vegetation integrity scores for all growth forms set to zero.
	TSZ		
	ATZ		
	TPZ		

Clearing extent	Management zone	Clearing method	Predicted impact on growth forms
Partial Clearing Areas	ECZ	During construction, in areas safely accessible to a machine, smaller trees (or other tall growing vegetation) less than 200 millimetres diameter at breast height (DBH) would be removed using an excavator-mulcher. Vegetation more than 200 millimetres DBH would be removed using a forest harvester, noting that tree branches/canopy may be mulched in-situ. The tree barrels (trunks)would either be: • Tub ground to provide material for erosion/sediment control and rehabilitation for use outside of the ECZ • Relocated to the edge of the easement and retained as habitat where applicable • Re-used by FCNSW/NPWS. During operational vegetation maintenance a range of mechanical and manual vegetation removal/management methods would be employed including: • Removal and/or herbicidal application of any regrowth with potential to infringe on safe electrical clearances • Selective hand clearing and/or application of an herbicide to control growth • Selective slashing and/or mulching with slasher/mulcher set to 200 millimetres above the ground level across the easement, particularly below the transmission lines or to establish safe access during maintenance.	During construction, machinery (including tracked machinery) would be used to clear the ECZ. As such, ground cover species and low growth shrubs would be affected (particularly by trampling) during the mechanical clearing process as part of the movement of the machinery throughout the ECZ. The mulching of vegetation debris would also be dispersed throughout the zone during construction clearing, however the debris across the ground surface is not expected to exceed a thickness that would limit the rehabilitation/emergence of ground cover species following construction. During operation, potential future slashing and mulching of the ECZ may be required to manage mitigate flashover and bushfire risks posed by tall and/or dense growing and mid-story vegetation. Slashing and mulching would impact all vegetation strata across the ECZ, leaving all vegetation cut to a height of approximately 200 millimetres. Given the potential need for slashing and mulching across the entirety of the ECZ (aside from the hand clearing areas), future vegetation integrity (VI) scores would be assigned to reflect the extent of this worst case impact under consultation with the BCS.

Clearing extent	Management zone	Clearing method	Predicted impact on growth forms
	ECZ (hand clearing)	In areas of the ECZ that are not safely or practicably accessible for machine clearing during construction, removal/management of vegetation would be carried out by hand clearing/felling. Felled trees would remain in-situ with the crowns/heads being cut/docked and laid flat. The same process would be carried out during ongoing operational vegetation maintenance.	Potential trampling and tree fall impacts to understory vegetation during felling; however minimal long term impact on the integrity of the shrub and grass/ground cover layer is expected. VI score would be assigned to reflect this extent of impact under consultation with BCS.
	HTZ	Hand felling of trees would be the preferred method where terrain (or other constraints) preclude management by machine.	Partial loss of habitat and vegetation integrity caused from the individual removal/pruning of identified hazard trees. It has been estimated that approximately 164 trees within the HTZ (67 trees per hectare) would require management within this zone.

Erosion and sediment control

There is potential for impacts to the water quality of local waterways during the initial phase of construction when the greatest area of disturbance would occur due to surface construction activities.

As stated in the EIS, erosion and sedimentation would be managed through implementation of effective erosion and sediment control measures such as erosion and sediment control plans (ESCP) as outlined in the SWMP which will be prepared and implemented prior to and during construction. The SWMP would also include monitoring, maintenance, and rehabilitation. The SWMP would also include measures for the management and discharge of groundwater if dewatering is required and include a surface water quality monitoring program.

A surface water quality monitoring strategy has been prepared in consultation with the EPA. This strategy is provided in Appendix E of the Amendment Report and would form the basis of the surface water quality monitoring program. The surface water quality monitoring program would be prepared and implemented to gain an appreciation of background water quality, to observe any changes in surface water quality that may be attributable to the project and inform appropriate management responses.

During the preparation of the water quality monitoring strategy, Transgrid has been working closely with the EPA in developing and designing key sediment and erosion controls as to prevent any change to the existing baseline surface water quality within and adjoining the project area.

The erosion and sediment control measures to be implemented during the construction of the project would be based on five principles:

- Controlling the occurrence of erosion
- Controlling the movement of sediment
- Diverting offsite “clean” water away from construction areas
- Diverting onsite “dirty” water towards a sediment basin or sediment trap
- Capturing sediments that are transported through diversion drains in basins.

To achieve these principles, water quality during construction would be managed using the below measures which would be further detailed in a comprehensive ESCP and accompanying report that would be submitted to the EPA for approval before it is implemented:

- Procedural controls
- Site managed erosion control measures
- Physical sediment control measures
- Treatment with sediment basins
- Monitoring and maintenance.

In summary, all practical measures to avoid and minimise potential impacts from erosion and sediment have been and would continue to be investigated and deployed.

Further details on sediment and erosion control are provided in Section 3.2.3.3 of the Amendment Report.

Spoil management

As stated in Section 5.4.7 of the EIS, the strategy for the management of excavated material would aim to maximise the beneficial reuse of materials for construction activities, which may include the reuse of road

base, construction benches at the transmission structure sites, landscaping or other uses as part of the substation build.

The strategy for the management and disposal of excavated material would be documented in the spoil management strategy and in agreement with NPWS and FCNSW. This strategy would also include details on the disposal arrangement with Snowy Hydro.

During the initial design development, the alternative arrangements considered for excess spoil disposal included trucking the excess material off site. This would have substantial traffic impacts on the local road and would conflict with Snowy 2.0 heavy vehicle movement within Lobs Hole/Ravine area. As such, emplacement was selected as the preferred method of spoil disposal. No subaqueous disposal of spoil would occur as part of the project.

The estimated excess spoil for the amended project has been reduced to from about 364,800m^3 to about 180,000m^3 and represents about a 49% reduction. Refer to Appendix A of the Amendment Report for further details.

Excess spoil generated within the project area which cannot be reused is expected to be disposed of via the following methods:

- Project area west: Excess spoil generated in project area west within Bago State Forest would be disposed of at the substation site and would be contoured to blend in with the natural landscape under consultation with FCNSW. Exposed areas would be stabilised and rehabilitated with low growing native grass species. Some stockpiling of excess spoil material may occur within a cleared section of the substation disturbance area. No spoil would be removed off site
- Project area east: Spoil would be transported by truck from the work locations via Lobs Hole to spoil emplacement locations approved as part of Snowy 2.0, such as Ravine Bay, GF01 and Main Yard emplacement areas with the locations shown in **Figure 3-4**. The haulage of this material would be confined to the newly formed access tracks and the established access tracks at Lobs Hole formed as part of Snowy 2.0. These areas would be closed to the public for the duration of construction. Once the material has been transported to the emplacement areas, it would be managed and disposed of in accordance with the Snowy 2.0 Main Works approval.

While there is sufficient capacity for all the project's excess spoil to be placed in the Ravine Bay emplacement area, should this location not be available during construction of the project, there is also sufficient approved capacity under Snowy 2.0 to accommodate the disposal of any balance of spoil at GF01, Main Yard or other emplacement areas approved under the Snowy 2.0 Main Works. The use of the GF01 and Main Yard areas was assessed as part of the Snowy 2.0 Main Works EIS (EMM, 2019).

Prior to transporting the excess spoil material, it would be assessed to ensure it is consistent with the relevant parameters within the conditions for the Snowy 2.0 project and suitable for disposal within the given emplacement area. No NOA material, if encountered, would be disposed of at the Ravine Bay, GF01 or Main Yard emplacement areas. If NOA is determined to be present, it would be managed and disposed of at a suitable licenced facility or a dedicated Snowy 2.0 approved NOA emplacement area and in accordance with a dedicated NOA management plan.

The excavated material would be transported to the emplacement areas by Transgrid and/or the contractor and then managed by Snowy Hydro in accordance with the relevant approved Snowy 2.0 Rehabilitation Plan prepared by Snowy Hydro.

A spoil management strategy would be prepared for the project, which will outline appropriate management procedures for the generation, management, and importation (if required) of spoil. It will also include details on the disposal arrangement with Snowy Hydro.

No material would be transported and disposed of at the emplacement areas until Snowy Hydro has prepared the relevant management plan(s) for emplacement and the necessary approvals have been granted to facilitate emplacement.

The management of excavated material including the emplacement locations is described further in Section A.4.7 of Appendix A of the Amendment report.

Works over Talbingo Reservoir

A temporary exclusion area for aquatic activities would also be established during the overhead stringing of transmission lines across Talbingo Reservoir. The expected width of the exclusion zone over Talbingo Reservoir would be approximately 100 metres wide either side of the centreline of each transmission line. During this time, all water activity would be restricted within this zone. The exclusion zone would only be in place for a short duration (matter of hours) for each conductor and earthwire. In total, twelve conductors and four earthwires would need to be strung over a period of approximately six weeks.

The temporary exclusion area would be enforced by a marine vessel. The vessel is expected to be launched from the boat ramp at O'Hares campground or the Talbingo Dam boat ramp.

General access and use of other sections of Talbingo Reservoir would be maintained for recreational boating and fishing, including areas south of Coonara Point.

Dewatering

Dewatering is considered unlikely due to the generally shallow depths of excavation. However, should dewatering be required, the water would be tested prior to discharge to ensure water quality meets relevant WQOs of downstream waterways, or equal to/better than background concentrations if water quality WQOs are currently not being met. Appropriate treatment measures would be implemented if it is determined that water quality exceeds relevant trigger values (or is outside the guideline range for some indicators).

If dewatering is required, the project would not discharge water directly into waterways. Instead, dewatering would be limited to discharge as overland flow in vegetated, grassed areas away from waterways.

Should the amount of water extracted be more than 3 ML/year, a water access licence would be obtained. Any required dewatering, including management and discharge for groundwater, would be managed under the SWMP.

4.1.3.2. Resources – availability of water required for construction

As stated in Section 5.4.6.2 of the EIS, approximately 60,000 kilolitres of water would be required over the duration of construction. The initial project assumed that all water required to facilitate construction in project area west (approximately 40,000 kilolitres) would be sourced from the non-potable local Tumbarumba water supply network. However, Snowy Valleys Council advised Transgrid in July 2021 that it could not meet the estimated water demand requirements from the town water supply network without upgrades to the system being made therefore requiring an alternative water source to be identified for the project.

As such all water to be used during construction in project area east would be sourced from Talbingo Reservoir, either using the Snowy 2.0 supply outlet fitted with separate metering equipment or a new supply pipe and outlet co-located with the Snowy 2.0 water supply infrastructure.

While construction water for project area west is expected to be sourced from a combination of the following locations:

- Snowy Hydro T2 Tailbay – A temporary water extraction site would be established along the access road to the existing Snowy Hydro T2 Tailbay site, located off Elliott Way and approximately five kilometres south east of the project area
- Paddy's River Flat Campground – Water trucks would access the council owned campground, located off Tooma Road (near the intersection of Elliott Way) and extract water directly from Paddy's River
- Town water supply – under consent from Snowy Valleys Council.

A water extraction licence would be sought prior to the extraction of any water from Talbingo Reservoir and the Paddy's River. Additionally, it can be expected that up to eight truck movements per day may be required to obtain water from the Snowy Hydro T2 Tailbay site or the Paddy's River Flat Campground.

Further details on construction water are provided in Appendix A of the Amendment Report.

4.2. Procedural matters

4.2.1. Assessment and approval

Most of the submissions in the issue category of assessment and approval raised concerns regarding procedural matters, including comments on the planning approval pathway and questions regarding the adequacy of the EIS and BDAR. Comments were also received regarding post approval liability and the adequacy of the consultation process.

Other matters raised were:

- Concern that the planning approval pathway is flawed and that the CSSI status of the project has resulted in an inadequate planning approval process
- Approval of the project would set a precedent for further transmission connections in environmentally sensitive landscapes
- Questioned the adequacy of the EIS, including inconsistency with the KNP PoM and insufficient analysis of any feasible alternatives
- The BDAR and EIS do not fully comply with the BAM
- If the project is approved, the potential liability for NPWS post construction in various circumstances needs to be addressed
- Concerns that Transgrid currently fails to protect the easements outside the KNP and therefore would not meet their environmental obligations for the easement within KNP
- Not all stakeholders were communicated with.

Responses to these matters are provided below.

4.2.1.1. The assessment process – adequacy and legality

The NSW Minister for Planning and Public Spaces declared Snowy 2.0 and the project to be CSSI under the provisions of the EP&A Act on 7 March 2018. The declaration acknowledges that Snowy 2.0 and the project

are critical to the State for environmental, economic, or social reasons. As a CSSI project, the project is subject to Part 5, Division 5.2 of the EP&A Act, and in accordance with those requirements:

- Transgrid submitted a scoping study (*Preliminary Environmental Assessment - Snowy 2.0 Transmission Connection Project* (Transgrid, 2018)) to the Secretary of DPE in November 2018 requesting that SEARs be issued for the project (s5.15, EP&A Act)
- The Secretary of DPE issued SEARS for the project on 1 November 2019, requiring that an EIS be prepared. In preparing the SEARs, the Secretary of DPE consulted with relevant government agencies and had regard to the need for the requirements to assess key issues raised by the government agencies (s5.16, EP&A Act)
- In February 2021, Transgrid submitted to the Secretary of DPE the EIS which addressed the SEARs in the form prescribed by the Regulations (s5.17, EP&A Act)
- The Secretary placed the EIS on public exhibition for a period of 42 days (s5.17 and s5.28, EP&A Act)
- All submissions received during the public exhibition period have been reviewed and responses are provided in this Submissions Report (s5.17 EP&A Act)
- An Amendment Report has been prepared to describe the project amendments, project clarifications, additional environmental assessment carried out following exhibition of the EIS and updated mitigation measures (s5.17 EP&A Act).

An EIS is a publicly available document that provides information on a project, including its environmental impacts and mitigation measures. The primary purpose of an EIS is to help the community, government agencies, organisations, and the decision-maker to understand the likely consequences of a project and make informed submissions or decisions. The information to be provided in an EIS is set out in the SEARs.

The EIS was prepared in line with legislative requirements set out in the EP&A Act and EP&A Regulation, with guidance on its format, structure and length provided by the *Draft Environmental Impact Assessment Guidance Series, Preparing an Environmental Impact Statement* (Department of Planning and Environment (DPE) 2017) (noting that these guidelines have recently been replaced by *State Significant Infrastructure Guidelines*, dated July 2021, including *Appendix B – Preparing an Environmental Impact Assessment*).

The EIS main body identified and addressed all the key impacts and issues in accordance with the SEARs and as informed by the technical assessments that were provided as appendices to the EIS. These technical assessments were prepared in accordance with the key issues identified in the SEARs, which included requirements issued by key government regulatory agencies as well as industry standards and guidelines.

This approach allows readers to gain an understanding of the environmental assessment that has been carried out, while also providing access to the full supporting technical assessments, which are very detailed documents and can be overwhelming in quantity. It is difficult to reduce the quantity of some of these documents due to the scientific and technical nature of the studies and their reporting requirements. However, the detailed assessments are made available for the community to review if they would like to understand more about a specific key issue.

The EIS was made publicly available on the DPE Major Projects website in accessible formats. The minimum public exhibition period required by legislation is 28 days (four weeks). The EIS was publicly exhibited between 23 February 2021 and 5 April 2021, for a total of 42 days (six weeks). The public exhibition period is set by DPE.

Transgrid is the proponent for the project and was supported by a team of qualified professionals to provide a balanced assessment of environmental impacts in accordance with legislative requirements, as well as subject matter experts and specialists in their field.

Following lodgement of this Submissions Report and the Amendment Report, the Secretary of DPE will prepare an Environmental Assessment Report on the project to be provided to the NSW Minister for Planning and Public Spaces for the purposes of the Minister's consideration of the application for approval to carry out the project. The Minister for Planning and Public Spaces then decides whether or not to approve the project, considering the Secretary's report, any advice from the Minister for Energy and Environment, and any findings or recommendations of the Independent Planning Commission if there any in respect of the project. Approval, if given, is made under Division 5.2 of the EP&A Act, with modification or conditions to the project as required.

In addition to the steps/ process described above, Transgrid submitted an EPBC Act referral (2018/8363) to the former Commonwealth Department of Environment and Energy (DEE) (now DAWE) on 28 February 2019 to consider whether the project would be considered to be a controlled action. On 5 April 2019, the former DEE determined the project to be a 'controlled action' with the relevant controlling provisions being national heritage places, listed threatened species and communities and listed migratory species.

The NSW Government confirmed the action (ie the project) would be assessed under the "Bilateral agreement made under section 45 of the EPBC Act relating to environmental assessment between Commonwealth of Australia and the State of New South Wales" (Bilateral Agreement) (2015). The Bilateral Agreement accredits the assessment process under Part 5, Division 5.2 of the EP&A Act, meaning that the State-level assessment is sufficient to satisfy the assessment requirements under the EPBC Act. As the project is a controlled action, the Commonwealth Minister for the Environment would need to issue a separate approval for the project before it can proceed.

Therefore, two main approvals are required for the project: an approval under the CSSI provisions of the EP&A Act from the NSW Minister for Planning and Public Spaces, and an approval under the EPBC Act from the Commonwealth Minister for the Environment.

The EIS assessment process was legally compliant with State and Commonwealth environmental assessment laws and is considered robust and sufficiently comprehensive. As such, Transgrid does not consider that it is flawed or inadequate.

4.2.1.2. The risk of setting a precedent for further transmission connections in environmentally sensitive landscapes

As outlined above, the project is subject to Part 5, Division 5.2 of the EP&A Act which requires the preparation of an EIS in accordance with SEARs. The Minister for Planning and Public Spaces will decide whether to grant or refuse approval, under Section 5.19 of the EP&A Act based on the impacts specific to this project, as detailed in the EIS, this Submissions Report and the Amendment Report and as assessed by the Planning Secretary's assessment report.

The process, as defined in the EP&A Act, requires that each project subject to an application is assessed individually. Any future transmissions projects in environmentally sensitive landscapes proposed by Transgrid, or any other proponent, would be assessed separately s under the EP&A Act. If required, the proponent would prepare an EIS the Minister for Planning and Public Spaces would then decide whether or not to approve the future transmission projects based on the merits of the project and the assessment of the impacts described in the required EIS and Preferred Infrastructure or Amendment Reports if required.

4.2.1.3. Adequacy of the EIS

Concerns raised in submissions regarding the adequacy of the EIS included:

- The EIS fails to comply with the requirements of the EP&A Regulation and the SEARs to include 'an analysis of any feasible alternatives'. In particular, the EIS hasn't properly considered viable underground transmission alternatives and does not include an analysis of any feasible alternatives.
- The EIS fails to consider the statutory purpose and identified values for which the KNP was gazetted under the NPW Act
- The proposal for overhead transmission is inconsistent with the KNP PoM, which prohibits the construction of any additional overhead transmission lines in KNP and requires that existing lines be rationalised or placed underground, wherever possible. Further, the proposed amendment to the KNP PoM is considered inappropriate, as it doesn't meet the requirements of the NPW Act and therefore should not be approved.
- The EIS fails to consider cumulative impacts of the proposed overhead lines on top of the other components of the Snowy 2.0 projects and the existing transmission lines within the KNP. The project should be considered within the wider context of Snowy 2.0, HumeLink, and the entire length of the Snowy 2.0 connection to the main grid backbone
- The EIS fails to propose environmental damage mitigation measures. Proposed mitigation measures are limited to the future preparation of a CEMP.
- The EIS fails to adequately address the environmental impacts of overhead transmission and focuses almost exclusively on the construction footprint, while ignoring the wider impacts associated with the fragmentation of habitat, loss of connectivity, disruption of ecosystem processes, introduction of weeds and feral species into a largely undisturbed area of KNP.

As outlined in **Section 4.2.1.1**, the EIS was prepared in line with the requirements set out in the EP&A Act and EP&A Regulation and was based on a large number of comprehensive technical assessments (contained in appendices to the EIS). These technical assessments were prepared in accordance with the key issues identified in the SEARs, which included requirements issued by key government regulatory agencies as well as industry standards and guidelines. The EIS and all appended technical reports were subject to an adequacy review by DPE prior to public exhibition to ensure all SEARs were properly addressed.

Transgrid's response to submissions relating to the adequacy of the EIS are set out below, under the sub-headings lack of analysis of any feasible alternatives, KNP values, consistency with the KNP PoM, cumulative impacts, mitigation measures and assessment of impacts.

Lack of analysis of alternatives

As described in **Section 4.1.1.1**, Transgrid followed the appropriate requirements for preparing an EIS. The EIS considered several project options (including substation locations, connection points, connection types (underground and overhead)) to determine the optimal solution to meet the transmission connection objectives. Early optioneering work carried out by both Transgrid and Snowy Hydro determined that an overhead connection to Line 64 was the optimal solution. As a result, the scoping report submitted to DPE was based on an overhead connection and, subsequently, SEARs were issued on that basis. At that time, DPE did not question this design approach. The process and outcomes of the early options assessment work were captured in Chapter 3 of the EIS and sufficiently satisfied the SEARs in relation to this matter.

Since the exhibition of the EIS, and because a number of submissions queried the analysis of options in the EIS, a further options assessment has been carried out for several different connection options as described in Options Report and summarised in **Section 3.2** and **Section 4.1.1**. The findings of the Options Report

reinforced the options assessment presented in the EIS, after considering and assessing the further options put forward in the submissions received, and confirmed the project remains the optimal and preferred option.

KNP values

The NPW Act aims to conserve nature including habitats, biological diversity, and significant landforms, landscapes, and natural features. Division 2, Section 30E of the NPW Act states that the purpose of reserving land as a national park is to identify, protect and conserve areas containing outstanding or representative ecosystems, natural or cultural features or landscapes or phenomena that provide opportunities for public appreciation and inspiration and sustainable visitor or tourist use and enjoyment. As such, KNP is reserved as a national park under Part 4, Division 3 of the NPW Act.

Transgrid recognises the pristine environment in which the project and Snowy 2.0 are located within KNP and acknowledges that KNP contains unique sub-alpine values and declared wilderness areas and is listed on the Australian National Heritage List. Since the inception of the project, the aim of the design has been to avoid and minimise environmental impacts as much as possible. The primary driver of many of the design amendments has been to continually reduce the project's footprint. As such, Transgrid and its contractor have reassessed the footprint that was initially proposed in the EIS and have refined it. While there would continue to be a need for a permanent disturbance area for operation, the disturbance area needed for construction has been further refined and reduced by 12.6% from 143 hectares to approximately 125 hectares. As ongoing design continues, Transgrid and its construction contractor would continue to look for ways to minimise the disturbance area, wherever possible.

A revised BDAR has been completed based on the reduced disturbance area and further describes the predicted impacts to biodiversity. This is provided as Appendix C of the Amendment Report. The EIS contains detailed descriptions of the environment and values of KNP. The environmental technical assessments carried out for the project have contributed to gaining a better understanding of these values and has been critical to the avoidance and minimisation of impacts that has been achieved through the project's iterative design and assessment process.

An assessment of the project against the protected heritage values of the Australian Alps (of which KNP is a part) was carried out as part of the heritage assessment in the EIS (refer to Section 7.3 and Appendix G of the EIS). These values are commensurate with those in the KNP PoM, consisting of natural, cultural, and recreational values. Furthermore, DAWE indicated during consultation in June 2021 that they are generally supportive of the level of assessment carried out and in agreeance with the outcomes of the assessment in relation to impacts on non-Aboriginal heritage (refer to Section 5.1 of the Amendment Report).

In addition, as part of the EIS, a LCVIA was carried out for the project based on a quantitative analysis and qualitative assessment of views from the surrounding landscape. As determined in the LCVIA, there are limited public accessible locations that the project would be visible from and most of these locations would be naturally screened by the intervening vegetation. Even so, Transgrid recognises that transmission lines and the associated infrastructure does impose impacts on visual amenity and, as such, has designed the project to be as unobtrusive as possible and to keep as much infrastructure outside of KNP.

Further, individual values were considered in each relevant technical assessment prepared with the EIS, in particular:

- Natural heritage:
  - Native plants and animals were considered in the biodiversity assessment (Section 7.1 and Appendix B of the EIS) and the revised BDAR (Appendix C of the Amendment Report)
  - Rivers and lakes ecosystem processes were considered in the water assessment (Section 7.4 and Appendix I of the EIS)
  - Rocks and landforms, karst areas and soils were considered in the land assessment (Section 7.5 of the EIS)
  - Wilderness and aesthetic were considered in the LCVIA (Section 7.7 and Appendix H of the EIS). Noting that the nearest wilderness area is Bogong Peaks Wilderness, located over 15 kilometres to the north of the project.
- Cultural heritage:
  - Aboriginal heritage values were considered as part of the Aboriginal heritage assessment (Section 7.2 and Appendix C of the EIS) and the AACHAR (Appendix D of the Amendment Report)
  - Pastoralism, huts, and mining were considered as part of the non-Aboriginal assessment (Section 7.3 and Appendix G of the EIS)
  - Scientific research and conservation were considered as part of the water and biodiversity assessments (Section 7.1, Section 7.4, Appendix B and Appendix I of the EIS)
- Tourism and recreation were considered as part of the social and economic assessment (Section 7.11 and Appendix E of the EIS).

Utilitarian functions are also described as values in the KNP PoM, which includes the existing Snowy Scheme. The existing Snowy Scheme and assets have long been part of the KNP landscape and are a key feature in park recreation and visitation.

Due to the nature of the project and clearing requirements, impacts to small parts of KNP and some of its habitats is unavoidable. Ongoing design of the project has further minimised the disturbance area and attempted to maintain as much of the existing natural environment as is reasonable and feasible.

This is consistent with the broader biodiversity mitigation process to avoid, minimise and offset. Where impacts are unavoidable, they would be offset in accordance with the BOS (EMM, 2021) (provided in Appendix L of the revised BDAR) to achieve long-term conservation outcomes in the park, in line with the values and mitigation strategies outlined in the KNP PoM and as determined in consultation with NPWS.

As outlined in **Section 4.3.1.2**, payments would be made NPWS who will use these funds to enhance the biodiversity and conservation values of the KNP. The BOS is expected to be implemented over time and to deliver benefits for the natural values of the KNP and the people who use it.

The conservation actions would help to rehabilitate, restore and enhance altered catchments and habitat loss that have occurred due to weeds, pests and degraded aquatic habitat including loss of riparian corridors to the equivalent magnitude of the residual impacts associated with the project. In addition specific conservation actions for key species including *Caladenia montana*, Gang Cockatoo, Masked Owl, Booroolong frog, Eastern Pygmy-possum, Yellow bellied Glider, Squirrel Glider and Greater Glider would be included.

Further information regarding the proposed BOS is provided in **Section 4.3.1.2** and Appendix L of the revised BDAR.

Consistency with the KNP PoM

The KNP PoM is the statutory plan that determines permissible activities within lands gazetted under the NPW Act. Therefore, in accordance with Part 5 of the NPW Act, all activities within KNP must be consistent with the KNP PoM.

It is noted that the KNP PoM specifically recognises the existence of the Snowy Scheme and provides for its continuation.

The KNP PoM expressly requires any additional transmission lines in KNP to be located underground and for existing overhead lines to be rationalised wherever possible. Consequently, the project is currently not consistent with the KNP PoM and an amendment to the KNP PoM will be required to enable Snowy 2.0 to connect to the grid via an overhead transmission connection.

Transgrid is aware of the prohibition of overhead lines in the KNP PoM, however, Transgrid's preferred and the most viable solution for the project is to use overhead transmission lines (see the EIS and **Section 3.2**). The EIS and the Options Report have provided justification for an overhead connection and the project has sought to meet the general principles of the KNP PoM and respect the statutory purpose and identified values for which the KNP was gazetted under the NPW Act, particularly with regard to avoiding and minimising the biodiversity impacts of the project. The Minister for Planning and Public Spaces will make a determination to approve the proposal or not, and potentially to do so subject to the KNP PoM being successfully amended.

As part of the initial application for SEARs, a scoping report was submitted to DPE, who then provided it to relevant government agencies for review and comment. While some comments by government agencies were received on the project and possible alternatives, no major issues were raised regarding the overhead connection at that stage. At that time, DPE did not question this design approach. Subsequently, the project based on an overhead connection was not rejected by DPE during the early phase of the project application and SEARs were issued. The draft of an amended KNP PoM (DPIE, 2021) is currently being exhibited on DPE's website: (https://www.environment.nsw.gov.au/research-and-publications/publications-search/kosciuszko-national-park-draft-amendment-to-the-plan-of-management-snowy-2-0). As stated on the website, recent changes to the *Snowy Hydro Corporatisation Act 1997* have been enacted to enable the CSSI Snowy 2.0 project to be carried out. These changes to the Snowy Hydro Corporatisation Act 1997 enable leases, licences, and easements to be issued for the project under the NPW Act. Several leases and licences have been issued for Snowy 2.0 with more expected to be issued over Snowy 2.0's development period.

The amendment of the KNP PoM is required to ensure that the project and Snowy 2.0 construction and operations authorised under the EP&A Act can be carried out in accordance with the KNP PoM. This amendment includes lifting the statutory prohibition on new overhead transmission lines to reflect the requirement to connect Snowy 2.0 to the grid via an overhead transmission connection as stated below:

"Require all additional telecommunication and transmission lines to be located underground, except those constructed as part of the Snowy 2.0 project."

If the draft KNP PoM currently being exhibited is accepted and approved, then the project would be consistent with the updated KNP PoM.

Cumulative impacts

The application and assessment process for the project has followed the well-established procedures for CSSI projects under the EP&A Act every step of the way.

The NSW and Commonwealth environment and planning systems allow for multiple major project applications to be submitted and assessed. Within this framework, cumulative impacts of projects are to be addressed where relevant. The EIS process for any major project of this size would take a number of years to complete in order for the appropriate design and environmental surveys, modelling and assessments to be undertaken with rigour and in line with best practice.

In accordance with the SEARS, the EIS included the strategic context of the project having regard to any other existing, approved or proposed projects that could result in cumulative impacts of the project (see Section 7.13 of the EIS). The major projects considered were:

- Snowy 2.0
- HumeLink
- Line 64 upgrade.

While these projects are and would be subject to their own commercial processes, environmental assessment and approvals, they have been considered to the extent possible using information publicly available at the time or sought directly from the respective proponent.

The cumulative impacts of the project were considered in Section 7.13 of the EIS and the technical assessments. The assessment focused on the project's potential interaction with Snowy 2.0 other projects in the vicinity of the project, and where construction and/or operational timeframes are likely to be concurrent. The EIS acknowledged the potential for cumulative impacts from the HumeLink and Line 64 upgrade projects. However as at the time of writing these projects were still in the scoping phase and detailed project impacts were not available.

There has been consideration of cumulative impacts, where possible, with available information including:

- Biodiversity assessment – assessment of cumulative impacts to native vegetation and threatened species from Snowy 2.0. Snowy Hydro has provided Transgrid with information on the clearing requirements for Snowy 2.0 and all relevant survey data to inform the cumulative assessment to be carried out for the project
- Water assessment – consideration of the surface water quality and flooding impacts of the project combined with Snowy 2.0
- Transport assessment – consideration of traffic movements inclusive of estimated traffic from Snowy 2.0. Information relating to estimated traffic movements were provided by Snowy Hydro considered within the assessment. The contribution of traffic from Snowy 2.0 was minimal
- LCVIA – consideration of short term and long term changes to visual amenity due to the combination of projects during operation, in particular where infrastructure proposed as part of the Snowy 2.0 interfaces with the project. The LCVIA considered the impacts of the existing transmission lines (Line 2) and acknowledged that these elements combined with the project would contribute to an overall increase in the amount of infrastructure in this area. The Supplementary LCVIA considered other potential mitigation measures available to help mitigate the visual impacts and to assist in absorbing the new structures into the existing setting of the area.
- Aboriginal heritage and non-Aboriginal assessments– consideration of impacts to historic heritage complexes and Aboriginal heritage providing consideration of cumulative impacts arising from the Snowy

2.0. Snowy Hydro provided Transgrid with all relevant survey data to inform the cumulative assessment for the project

- Social impact assessment – consideration of cumulative social impacts of the project combined with Snowy 2.0 and other project in the locality including impacts to: economic stimulus and employment opportunities, population change and housing affordability, pressure on local infrastructure, tourism, local workforce and the visual and scenic qualities of the KNP.

Appropriate measures would be implemented to minimise the cumulative impact on the community as far as practicable.

The Options Report (**Appendix D**) also considered at a high level, the environmental impacts of the alternative options, including alternative project connection points. The evaluation criteria in the options assessment and analysis included the consideration of the cumulative infrastructure needed for HumeLink and keeping as much infrastructure as possible outside of KNP. The project is to provide a direct connection between Snowy 2.0 and HumeLink.

The preferred option (the project) does keep as much infrastructure out of KNP including the new substation which would support the future 500 kV transmission line augmentations to Transgrid's network (HumeLink). With this option, no new HumeLink infrastructure would be required in KNP. The new substation location within Bago State Forest, as the connection point to Line 64, has been located close to the Elliot Way to reduce new access road construction and as directly west from Lobs Hole as possible to reduce the length of the transmission connection as much as possible. Also the location of the new substation would provide a reasonable separation from UTSS, LTSS and the existing Southern NSW 330 kV network which would help improve the level of resilience in this part of the NEM.

Mitigation measures

As stated in Section 8.1 of the EIS, Transgrid is committed to conducting its activities and services, including the project, in a manner that minimises pollution, environmental impacts, and complies with relevant legislation, industry standards and codes of practice. To achieve this, Transgrid maintains an Environmental Management System (EMS) that is certified under the international standard ISO 14001. All activities carried out for the project would be consistent with the EMS, and the construction contractor's EMS.

Following public exhibition of the EIS, revisions to the mitigation measures included in the EIS have been identified. Mitigation measures have been revised in order to further minimise environmental impacts, in response to submissions, discussions with government agencies, and as a result of further environmental assessments. The full list of mitigation measures including all revised environmental mitigation measures is provided in Appendix B of the Amendment Report.

Additional mitigation measures that have been suggested in some of the submissions included shorter structures, possibly of a pole design, no cleared easement, no access tracks, and construction/maintenance by helicopters and drones. These suggestions regarding shorter structures, possibly of a pole design, no cleared easement, no access tracks, were considered as part of the project analysis to select the preferred option, refer to **Section 3.2**. As such, these suggestions have not been included as mitigation measures.

In regard to construction/maintenance by helicopters and drones, the EIS did consider using drones to string the transmission lines and that helicopters may be used to transport personnel, materials and equipment to the higher elevations (eg sheep station ridge). However, it was determined following the exhibition of the EIS that this would not be required, and road access would be preferred.

In addition, the construction methodology to date does not allow for the use of helicopters for construction due to potential safety issues. As such, the removal of the helipad from the project has assisted in reducing the project disturbance footprint.

Drones would still be used to string the transmission lines. By stringing the transmission lines using drones the required disturbance area is less than if alternative methods were used. As such, the project has been designed with access to facilitate construction and operation.

Transgrid will continue to engage with government agencies, to refine mitigation measures and develop and enhance long-term recreational values for KNP.

Should the project be approved, the CoA would guide subsequent phases of the project. Post approval design, as well as construction and operation, would be carried out in accordance with CoA, updated mitigation measures (refer to Appendix B of the Amendment Report) and management plans prepared for the project.

Assessment of environmental impacts of overhead transmission

For the purposes of identifying and assessing environmental impacts of the project, a disturbance area and broader project area were defined in the EIS. The disturbance area encompasses the extent of physical disturbance (direct impacts) likely to be required to accommodate construction activities required for the project.

However, the EIS and BDAR (Appendix L of the EIS) considered impacts on a much broader scale, such as fragmentation of habitat, loss of connectivity, disruption of ecosystem, introduction of weeds and feral species. The biodiversity study area and 1,500 metre landscape buffer are shown on Figure 7-1 of the EIS.

Transgrid also notes that the revised BDAR and AACHAR have included additional assessment and site surveys post the EIS exhibition which has strengthened our ecological and Aboriginal heritage impact assessment for project. The ecological and Aboriginal heritage impacts are discussed further in the revised BDAR and AACHAR which are appended to the Amendment Report. Comments raised in the submissions regarding biodiversity and Aboriginal heritage are discussed in **Section 4.3.1** and **Section 4.3.2** respectively.

4.2.1.4. Adequacy of the technical assessments

A detailed review of the BDAR by NPWS and BCS was received as part of their submission. The main concerns outlined in this review were that the EIS and BDAR do not comply with the BAM. The key issues include:

- Potential impacts to some threatened species, including the Booroolong frog and *Caladenia montana*, are not adequately considered
- Insufficient detail has been provided about measures to mitigate, monitor and manage potential impacts to have confidence that the calculated credit requirement will sufficiently offset residual impacts of the development
- The BOS is incomplete. Further details are required on how credits will be determined and how the credit obligation can be met within and outside KNP is required.

A revised BDAR has been prepared in response to the NPWS/BCS submissions and to assess the amended project and is provided in Appendix C of the Amendment Report. The revised BDAR includes further assessment of the project impacts on the Booroolong frog, Powerful Owl (*Ninox strenua*) and *Caladenia montana*.

The BOS has now been prepared which includes detail and further analysis about how credits will be determined and how the credit obligation can be met within and outside KNP. The revised BDAR which includes the BOS is provided as Appendix C of Amendment Report, with additional findings to the EIS summarised in Chapter 6 of the Amendment Report.

4.2.1.5. Issues after project approval

Environmental obligations for the easement within KNP

Transgrid has been operating in KNP in accordance with a range of administrative and management arrangements for many years.

Following construction, the transmission line easements would be sought from NPWS and FCNSW to provide Transgrid the necessary property tenure and rights to access, operate and maintain the connection assets.

Once the transmission line is operational, the transmission line easements and access tracks would be managed in accordance with the CoA and associated management plans. Additionally, for the portion of the project in KNP, the easement and access tracks would be managed and maintained in accordance with the Memorandum of Understanding (MOU) established between Transgrid and NPWS for the ongoing operation and maintenance of transmission assets within National Parks reserves.

Potential liability for NPWS

NPWS raised concern that if the project is approved, the potential liability for NPWS post construction circumstances needs to be addressed in three post construction circumstances:

- Rehabilitation does not meet completion criteria in agreed timeframe or is incapable of meeting the completion criteria
- Long term stability or contamination
- Increased biosecurity risks (weeds, pests and pathogens) associated with new access tracks and easements.

All post construction and rehabilitation requirements would rest with Transgrid. NPWS would be consulted as part of the preparation of the rehabilitation plan to ensure that it provides the appropriate framework, monitoring requirements and performance targets as agreed to with NPWS.

The rehabilitation and the management of biosecurity risks are discussed in **Section 4.3.1** and **Section 4.3.1.1** respectively.

4.2.1.6. Consultation/engagement

A submission was received which asserted that the necessary consultation with stakeholders has not taken place. Transgrid wholly disagrees with this assertion.

Transgrid has been consulting with the community and key stakeholders (including government agencies, councils and organisations) about the project and seeking input for the development of the EIS since 2018.

As described in **Section 3.1.1** and the EIS, a wide-ranging engagement program was developed prior to and during preparation of the EIS to consider the range of stakeholders who may be potentially impacted by or interested in the project. This included providing opportunities for general stakeholder participation, as well as more targeted engagement with government agencies (include BCS, NPWS and DPE) and Aboriginal group representatives.

The engagement activities also focused on providing the local community with information about the project and an opportunity to provide feedback on key issues and concerns.

During the EIS public exhibition, Transgrid continued to inform stakeholders through a variety of engagement tools, either in person or via digital platforms, including:

- Stakeholder briefings
- Project webpage
- Traditional media and advertisements
- Social media.

Further information regarding consultation activities carried out during and following EIS exhibition are provided in **Section 3.1**.

4.3. Project impacts

Many of the submissions raised concerns regarding the impacts of the project on biodiversity, visual amenity, water quality and recreational values of a largely pristine landscape within KNP.

Other comments raised in submissions were in relation to Aboriginal and non-Aboriginal heritage, flooding, land (property impacts), transport, and hazards and risks (fire management).

Responses to these matters are provided below, under sub-headings, as applicable, relating to construction and/or operational impacts, mitigation and other.

4.3.1. Biodiversity

Comments raised in submissions regarding biodiversity are summarised as follows:

- Additional clearing within KNP will further exacerbate impacts associated with the fragmentation of habitat, loss of connectivity and disruption of ecosystems
- Further studies are required to avoid, manage and mitigate impacts to alpine ferns or other PCTs or GDEs.
- Increased biosecurity risks (weeds, pests and pathogens) associated with new access tracks and easements in largely pristine areas of KNP
- Monitoring programs should be designed in collaboration with FCNSW and NPWS with existing programs to be complimentary and integrated
- More detail about offsetting.

Responses to these matters are provided below.

4.3.1.1. Construction and operation impacts

Vegetation clearing, impacts to threatened species, fragmentation of habitat, loss of connectivity and disruption of ecosystems

Ongoing design of the project has resulted in reductions in the overall disturbance area which would result in a reduction of the amount of vegetation required to be cleared.

As a result of the reduced disturbance area, the amended project would result in direct impact to 118.3 hectares of native vegetation. This would include the full clearance of about 71.0 hectares of vegetation within four management zones (TSZ, TPZ, ATZ and SZ) and the partial clearing of about 47.3 hectares within two

management zones (ECZ and HTZ), refer to **Figure 4-1**. As summarised in **Table 4-3**. This is a reduction of direct impacts to vegetation of about 13% from the impacts predicted in the BDAR exhibited with the EIS (Jacobs, 2021).

While the project would involve the removal of vegetation to allow the construction of, and ongoing operational maintenance of the asset for the life of the project, the design has allowed for total clearing only in areas identified for infrastructure and remaining areas of the project would, over the long-term result in partial clearing along the designated transmission easement.

The resulting modified vegetation would be maintained in this state for the life of the project, thereby retaining some of the original biodiversity values in the lower stratum and preserving the surface soil structure. By achieving this, the loss of vegetation to accommodate the infrastructure has been reduced from the initial concept design as assessed in the EIS.

There would be no direct impacts to any threatened ecological communities (TECs) as determined in the revised BDAR.

The removal of this vegetation would have direct impacts on threatened species habitat as outlined in **Table 4-4**. The reduced disturbance area has had a reduction on direct impacts, which has resulted in a concurrent reduction in the offsets required for the project. A full and complete revised impact assessment is provided in the revised BDAR (Appendix C of Amendment Report), while the BOS is provided in Appendix L of the revised BDAR.

Table 4-3 Summary of direct impacts to vegetation for the project as per the EIS and amended project

PCT	PCT name	Impacted area (ha)		
		Amended project		Project as per the EIS
		Fully cleared	Partial cleared	
285	Broad-leaved Sally grass - sedge woodland on valley flats and swamps in the NSW South Western Slopes Bioregion and adjoining South Eastern Highlands Bioregion	2.2	0	1.77
300	Ribbon Gum - Narrow-leaved (Robertsons) Peppermint montane fern - grass tall open forest on deep clay loam soils in the upper NSW South Western Slopes Bioregion and western Kosciuszko escarpment	14.86	17.15	43.28
1196	Snow Gum - Mountain Gum shrubby open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion	24.94	2.31	23.95
296	Brittle Gum - peppermint open forest of the Woomargama to Tumut region, NSW South Western Slopes Bioregion	8.25	10.77	21.15
302	Riparian Blakely's Red Gum - Broad-leaved Sally woodland - tea-tree - bottlebrush - wattle shrubland wetland of the NSW South Western Slopes Bioregion and South Eastern Highlands Bioregion	0.58	1.72	3.12
729	Broad-leaved Peppermint - Candlebark shrubby open forest of montane areas, southern South Eastern Highlands Bioregion and South East Corner Bioregion	14.07	12.81	34.72

PCT	PCT name	Impacted area (ha)		
		Amended project		Project as per the EIS
		Fully cleared	Partial cleared	
999	Norton's Box - Broad-leaved Peppermint open forest on footslopes, central and southern South Eastern Highlands Bioregion	6.13	2.47	7.61
Sub total		71.03	47.24	135.6
Total impacted vegetation		**118.26**		**135.60**

Table 4-4 Summary of direct impacts on threatened species habitat for the project as per the EIS and amended project with the reduced disturbance area)

Species name	Common name	EPBC Act	BC & FM Act	Impacted habitat (ha)	
				Amended project	Project as per the EIS
Birds					
Callocephalon fimbriatum	Gang-gang Cockatoo (breeding)	-	V	89.2	69.60
Tyto novaehollandiae	Masked Owl (breeding)	-	V	10.86	3.12
Amphibians					
Litoria booroolongensis	Booroolong Frog	E	E	1.66	3.12
Mammals					
Cercartetus nanus	Eastern Pygmy-possum	-	V	110.8	133.06
Petaurus australis - endangered population	Yellow-bellied Glider Population on the Bago Plateau	-	EP	52.62	61.22
Flora					
Caladenia montana		-	V	9.34	N/A

Key: E = endangered, EP = endangered population, V = vulnerable

Over the operational life of the project within the partial clearing management zones (ECZ and HTZ), it is expected that these PCTs would continue to exist in the partially cleared areas with a modified forest structure and flora and fauna diversity. There, the vegetation would retain some biodiversity value, in particular serving to protect and prevent soil degradation and erosion and provide shelter, food resources, cover and habitat connectivity for some fauna groups and species. The removal of habitat in the partially cleared areas would largely be associated with the clearing and ongoing suppression of trees and vegetation over 200 mm in height and old growth and hollow-bearing habitat trees in the HTZ. While there would be preservation of ground cover vegetation, which as noted would have some biodiversity value, for assessment and offset purposes it is assumed the loss would have a complete impact on threatened species.

In particular, the change in the structure and floristics of the habitat is expected to directly remove the habitat of threatened species, including:

- *Caladenia montana*
- Gang-gang Cockatoo and Masked Owl (breeding habitat)

- Booroolong Frog
- Arboreal mammals such as the Eastern Pygmy-possum, and Yellow-bellied Glider.

Prescribed biodiversity impacts (as defined by the BAM) are in addition to, or instead of, impacts from clearing vegetation and/or loss of habitat. The amended project does have the potential to result in prescribed biodiversity impacts, namely impacts to connectivity and movement for gliding mammals (i.e. fragmentation by vegetation clearing and collision with fences), vehicle strikes, noise vibration, dust, light and contaminates, impacts on water quality for aquatic species and the Booroolong Frog. These impacts are considered to be consistent with the impacts discussed in Section 7.1.3.1 of the EIS.

The operational impacts associated with the amended project such as habitat connectivity, collisions with transmission lines and substation lighting are considered to be consistent with the impacts discussed in Section 7.1.3.2 of the EIS.

Groundwater dependent ecosystems

The amended project is not likely to interrupt the hydrological connection between a GDE and the aquifer it depends on, nor is it likely to impact groundwater quality or recharge. This is because the project would have a limited interaction with groundwater. The amended project would however require the removal of facultative GDEs during construction (PCT 285, PCT 296, PCT 300 and PCT 302). The reduced disturbance area has reduced the amount of these PCT that would be required to be cleared.

Alpine ferns

None of the PCTs within the project area correspond to any EPBC Act listed TECs. Some vegetation along Yorkers Creek to the north and outside of the project area around the substation is likely to correspond to the EPBC Act listed *Alpine Sphagnum Bogs and Associated Ferns TEC*. This patch is upstream and north of Elliots Way so is unlikely to be affected by surface water flow from the project. However, there is another smaller mapped patch on Yorkers Creek around 500 metres downstream of the second order stream that flows from the substation site. This mapped area was not verified from surveys but has the potential to be indirectly impacted by surface water flow from the project. The potential for indirect impacts to this potential TEC would be managed by standard erosion control measures and drainage design around the substation site.

Biosecurity

As discussed in Section 7.1.3 of the EIS, the project may increase the biosecurity risks (weeds, pests and pathogens) associated with new access tracks and easements within Bago State Forest and KNP.

As such, a weed control and monitoring program will be developed to minimise the potential for biosecurity risks during construction and operation will be included in the Biodiversity Management Plan (BMP), in accordance with the *Biosecurity Act 2015*. Measure would include:

- Developing weed and pathogen control and monitoring programs which will include adaptive management strategies for priority weed species during construction, and early operational phase
- The control of the high threat weeds prior to clearing, and ongoing monitoring of weed invasion in adjoining habitat during construction
- Weed control works that will target the protection of riparian habitat. Outbreaks of weeds will be controlled quickly to ensure that infestations do not become unmanageable
- During the clearing works, weeds will be disposed and managed appropriately to stop the spread of existing weed species

- Any imported fill will be certified at source locations to ensure it is pathogen and weed free (Excavated Natural Material or Virgin Excavated Natural Material)
- Ensure vehicle and machinery hygiene measures are applied during construction and operation. This would include:
  - The requirement that all construction equipment will be washed and sterilised of soil, rock and vegetative material as a biosecurity practice before arriving at Bago State Forest or KNP
  - The provision of wash down stations to wash down vehicles and employee shoes to stop the spread of weeds, pathogens (including amphibian chytrid fungus, *Phytophthora cinnamomi* and exotic rust fungi) and the introduction of new species
- During construction and operation, any biosecurity issues identified are be reported to FCNSW and NPWS immediately.

4.3.1.2. Mitigation

A project specific BMP will be prepared and developed in consultation with NPWS and BCS to mitigate and managing impacts on biodiversity values. The BMP will provide more specific detail on the biodiversity mitigation measures which have been devised for the protection and monitoring of biodiversity, individual threatened species, and their habitat. The BMP will be based on SMART principals (Specific, Measurable, Achievable, Realistic, and Timebound) and will include details of a biodiversity monitoring and reporting program designed to monitor the performance of the mitigation measures proposed. The monitoring program will be designed to verify the extent of indirect impacts, identify where additional mitigation of indirect impacts is required.

The BMP would be designed in collaboration with FCNSW, NPWS, BCS and Snowy Hydro to ensure that existing programs are complimentary and integrated.

Monitoring programs

As stated above a biodiversity monitoring program will be developed post-approval as part of the BMP and implemented before, during and after construction to monitor the effectiveness of the mitigation measures, and provide adaptive management where performance measures are not met.

Monitoring would be conducted until such time as the mitigation measures have been proven to be effective after an agreed monitoring period. The monitoring data would aim to provide robust information to draw sound conclusions around the effectiveness of mitigation measures for the target species and groups, and inform adaptive management actions. The BMP will include a program to evaluate and publicly report on the outcomes of a biodiversity monitoring program.

The sections of the project within KNP would be developed with consideration of the Snowy 2.0 Main Works BMP and monitoring program to ensure collaboration with monitoring and sharing of data, for example water quality monitoring and Booroolong Frog monitoring as part of Snowy 2.0 would consider changes that may be affected by construction of the project near Yarrangobilly River and Wallace Creek.

The BMP would identify key species to be monitored, the specific locations proposed for conducting monitoring and the methods, variables and timing of the proposed monitoring, and include impact and control sites. The recommended framework for the biodiversity monitoring program is provided in Section 11.2 of the revised BDAR (Appendix C of the Amendment Report).

It is expected that monitoring would focus on key species where adequate data can be collected to detect change and set a reasonable and feasible distance from the easement for monitoring activity.

The monitoring would focus on the following impacts being mitigated:

- Removal of native vegetation and habitat
- Changes to surface runoff regimes
- Impacts on water quality and hydrological processes
- Increase in weeds and disease pathogens in adjacent vegetation
- Increase in predator and pest species
- Increase in risk of electrocution and EMF exposure
- Post-construction rehabilitation.

Offsets

Where residual impacts are unavoidable, offsets need to be identified in accordance with the BOS to achieve long-term conservation outcomes in KNP and Bago State Forest. The BOS has been prepared in consultation with NPWS and BCS for the amended project and is provided as Appendix L of the revised BDAR (Appendix C of the Amendment Report).

The project would result in clearing of 118.27 hectares of native vegetation and habitat for threatened species, including 75.4 hectares within KNP and an additional 42.9 hectares of clearing outside KNP. Offset requirements, including ecosystem and species credits within and outside KNP, are summarised in **Table 4-5**.

Table 4-5 Project offset requirements (Jacobs 2021) outside and inside KNP

Plant Community Type or Species	Credits		Total
	Outside KNP	Inside KNP	
Ecosystem credits			
PCT 285 - Broad-leaved Sally grass – sedge woodland on valley flats and swamps in the NSW South Western Slopes Bioregion and adjoining South Eastern Highlands Bioregion	87	-	87
PCT 296 - Brittle Gum - peppermint open forest of the Woomargama to Tumut region, NSW South Western Slopes Bioregion	-	421	421
PCT 300 - Ribbon Gum - Narrow-leaved (Robertsons) Peppermint montane fern - grass tall open forest on deep clay loam soils in the upper NSW South Western Slopes Bioregion and western Kosciuszko escarpment	365	485	850
PCT 302 - Riparian Blakely's Red Gum - Broad-leaved Sally woodland - tea-tree - bottlebrush - wattle shrubland wetland of the NSW South Western Slopes Bioregion and South Eastern Highlands Bioregion	-	51	51
PCT 729 - Broad-leaved Peppermint - Candlebark shrubby open forest of montane areas, southern South Eastern Highlands Bioregion and South East Corner Bioregion	-	574	574
PCT 999 - Norton's Box - Broad-leaved Peppermint open forest on footslopes, central and southern South Eastern Highlands Bioregion	-	168	168
PCT 1196 - Snow Gum - Mountain Gum shrubby open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion	836	-	836
Total Ecosystem credits	1,288	1,699	2,987
Species			
Caladenia montana	-	202	202
Gang-gang Cockatoo (*Callocephalon fimbriatum*)	1,688	1,414	3,102
Eastern Pygmy-possum (*Cercartetus nanus*)	1,439	2,249	3,688

Plant Community Type or Species	Credits		Total
	Outside KNP	Inside KNP	
Booroolong Frog (*Litoria booroolongensis*)	-	45	45
Yellow-bellied Glider (*Petaurus australis*) endangered population on the Bago Plateau	1,439	553	1,992
Masked Owl (*Tyto novaehollandiae*)	420	1	421
Total species credits	4,986	4,464	9,450
Total	**6,274**	**6,163**	**12,437**

The BOS proposes a two-part approach to the provision of biodiversity offsets for the project to address impacts inside and outside KNP separately as follows:

- Carrying out conservation management actions to offset project impacts in KNP using the framework and principles developed in the *Snowy 2.0 Main Works Revised Biodiversity Offset Strategy* (Snowy 2.0 BOS) (EMM, 2020)
- Application of the mechanisms for providing offsets, outlined in NSW Biodiversity Offset Scheme, to impacts occurring outside KNP.

Offsets for impacts inside of KNP

The management and conservation actions developed to offset impacts for Snowy 2.0 Main Works were assessed as being relevant to offset impacts associated with this project. However, this project would impact on the Yellow-bellied Glider, which was not impacted by Snowy 2.0 Main Works. As such, specific recommendations to offset impacts on Yellow bellied Glider have been included in the BOS. The management actions would include survey and monitoring of the Yellow-bellied Glider Bago plateau population as well as a strategy to address fragmentation issues.

For impacts within KNP, Snowy Hydro have committed to the funding of $82.3 million to the management of KNP across both the Snowy 2.0 Main Works and Exploratory Works. The project would see an additional $11.4 million of funding provided to NPWS for implementation of management actions to a broader area of KNP, resulting in a positive benefit for the biodiversity values of the KNP over the long-term.

Combined, this provides a substantial investment in management of biodiversity values in KNP, resulting in a direct, holistic and long-term benefit to the biodiversity values of KNP, including the species and communities impacted by both Snowy 2.0 and the project.

The conservation management actions would help to rehabilitate, restore and enhance altered catchments and habitat loss that have occurred due to weeds, pests and degraded aquatic habitat including loss of riparian corridors to the equivalent magnitude of the residual impacts associated with the works. These historical impacts have arisen from past land use in KNP, including mining, agricultural use and the development of the original Snowy scheme.

Offsets for impacts outside of KNP

Under the NSW Biodiversity Offsets Scheme several pathways are available to Snowy Hydro to meet the offset obligation arising from the project for impacts outside KNP. These include:

- Retirement of like-for-like credits
- Funding of a biodiversity action

- Payment into Biodiversity Conservation Fund (BCF)
- Undertake ecological rehabilitation.

Funding of a biodiversity conservation action is only available for a limited set of species and communities. The project is not a State Significant Development (SSD) mining project and thus ecological rehabilitation is not available. This means that offsets would need to be provided via retirement of like-for-like credits or payment into the BCF.

A review of BioBanking and BAM credits available in the market indicates that there are limited credits available that would be suitable as offsets for the project, with no credits available under the BAM that would meet project needs. It should be noted that all credits generated under the BioBanking scheme would need to be converted to an equivalent number of BAM credits. This process often results in a reduction in the number of credits generated under the BAM.

Ten sites were identified with an expression of interest (EOI) to generate BAM credits for all required credits for the project. However, at this stage the number of credits these sites are capable of generating is unknown and these sites would need to develop a Biodiversity Stewardship Agreement (BSA) to realise these credits and make them available for the project.

Transgrid's offset liability for all impacts occurring outside of KNP could be met by paying $21.95 million into the BCF. Compared to the relative benefit the local species would receive from such payments, Transgrid views payment into the BCF as the least attractive option and prefers to explore other avenues until all other options are exhausted.

Commonwealth offsets

As the project is considered unlikely to result in a significant impact to any Matter of National Environmental Significance (MNES) under the EPBC Act, specific offset actions for Commonwealth-listed species are not required as per the Commonwealth Biodiversity Offsets Policy.

Biodiversity Offset Package

Prior to any clearing of native vegetation and threatened species habitat for the project, a detailed Biodiversity Offset Package would be prepared. The Biodiversity Offset Package would include:

- The agreed management actions for impacts occurring within KNP, resulting in a positive benefit for the biodiversity values of the Park over the long-term and the financial contribution to made by Transgrid to the implementation of these actions
- Details of the specific biodiversity offset measures to be implemented and delivered in accordance with the BOS, including the proposed location for the retirement of like-for-like credits from existing and proponent drive offset sites and certainty that this can be achieved
- The cost which would be required to be paid into the BCF if the relevant measure is not implemented and delivered (as calculated in accordance with Division 6 of the BC Act and the biodiversity offsets payment calculator)
- The timing and responsibilities for the implementation and delivery of the measures required in the Biodiversity Offset Package
- Confirmation that the biodiversity offset measures would be implemented and delivered within two years of approval.

The BOS and the detailed Biodiversity Package that would be developed post-approval provides certainty that the residual impacts of the project can be adequately offset.

4.3.2. Aboriginal heritage

Comments raised in submissions regarding Aboriginal heritage included:

- Some of the project area remains unsurveyed and untested
- Test excavations have not been completed for all PADs within the project area
- The preparation of a Cultural Heritage Management Plan (CHMP), post approval, should not take the role of adequate assessment during the EIS process.

4.3.2.1. Construction impacts

An AACHAR has been prepared in response to the HNSW submissions and to assess the amended project. As part of the AACHAR, additional surveys and test excavations were carried out as summarised below.

In May 2021, Jacobs completed a field inspection in response to the identification of an unexpected Aboriginal object. The inspection resulted in the identification of an additional area of PAD and surface artefact at Structure 5 (Str5 PAD) as well as additional surface artefacts at ST PAD 01, ST PAD 02, and Aboriginal Heritage Information Management System (AHIMS) ID 56-6-0540 (located along the proposed access track to Structure 7).

Subsequently, test excavations were carried out within ST PAD 01 and ST PAD 02 between 17 August and 20 August 2021. The test excavation identified 20 artefacts at ST PAD 01 and 16 artefacts at ST PAD 02. The artefacts were identified within a context assessed as being of low archaeological integrity and as a result, ST PAD 01 and ST PAD 02 are considered to be of low significance. Based on the findings at ST PAD 01 and ST PAD 02, Str5 PAD was assessed as having no potential to contain subsurface artefacts, and no excavations were completed.

On 24 August 2021, HNSW was contacted and provided with an overview of the reassessment of Str5 PAD. HNSW confirmed that test excavations would not be required at Str5 PAD. Following the reassessment, Str5 PAD was renamed Str5 AS, as it is an artefact scatter. Due to the lack of archaeological integrity at Str5 AS, the site is considered to be of low significance.

The assessment of impacts included in the ACHAR (Jacobs 2020) was revised and documented in the AACHAR. It was found that the amended project would no longer impact AHIMS ID 56-6-0041. However, as a result of the design amendment, AHIMS ID 56-6-0540 and AHIMS ID 56-6-0048 would be totally impacted by the project, resulting in a total loss of value. ST PAD 01, ST PAD 02, and Str5 AS would be partially impacted, resulting in a partial loss of value.

HNSW also noted that the track atop Sheep Station Ridge was not assessed and that additional investigations of the area would be required to identify and assess Aboriginal heritage. However, as part of the proposed amendments, the unsurveyed access track at Sheep Station Ridge is no longer required and was removed from the project design.

The full revised disturbance area has now been surveyed and test excavations have been completed for all PADs within the revised disturbance area.

A CHMP would be developed to provide guidance on the procedure for the identification of unexpected Aboriginal objects and the long-term management of Aboriginal objects retrieved from ST PAD 01, ST PAD 02, Str5 AS, AHIMS ID 56-6-0540, and AHIMS ID 56-6-0048.

The AACHAR is attached as Appendix D to the Amendment Report.

4.3.3. Non-Aboriginal heritage

Comments raised in submissions regarding non-Aboriginal heritage included:

- Clarification on significance of impacts on non-Aboriginal heritage items of archaeological potential, including associations with the historical Snowy Hydro Scheme
- As the project area contains local heritage items, and other local items are in the vicinity, advice should be sought from the relevant local council
- Recommendations of archaeological conditions including a condition requiring nomination of a suitably qualified and experienced historical archaeologist to manage the historical archaeological program and the preparation of the Archaeological Research Design and Excavation Methodology.

Responses to these matters are provided below.

4.3.3.1. Construction impacts

Items of archaeological potential

As stated in Table 4-11 of the non-Aboriginal heritage assessment (Appendix G of the EIS), five heritage items were identified by NSW Archaeology (2019) as having archaeological potential within the disturbance area. Three of these heritage items were assessed as having low archaeological potential, one with high archaeological potential and one with moderate-high archaeological potential. These were shown on the map in Figure 4-16 of the non-Aboriginal heritage assessment (Appendix G of the EIS).

In comparing these assessment results with the Snowy 2.0 Main Works Heritage Assessment and Statement of Heritage Impact (NSW Archaeology 2019), Appendix P.2 of the Main Works EIS, these five items were assessed as shown in **Table 4-6**.

Table 4-6 Comparison of assessment of archaeological potential of heritage items in Jacobs 2020 and NSW Archaeology 2019

Item no	Item name	Jacobs 2020 assessment	NSW Archaeology 2019 assessment
R46	Large excavation	Low	Negligible
R56	Excavated ditch	Low	Negligible
R107	Building platform	Low	High
R120	Building platform	High	High
R128	First school at Lobs Hole	Moderate – High	Moderate – High

For R46 and R56, Jacobs concurs with the assessment of negligible/low potential by NSW Archaeology (2019). As a result of the low level of archaeological potential/archaeological significance, there would be no requirement for impact assessment of these items, and therefore no management measures required.

For R107, while the Table 4-11 of the Non-Aboriginal Heritage Technical Paper (Appendix G of the EIS) states that the archaeological potential is low, it should read as being high, consistent with the NSW Archaeology (2019) assessment, refer to **Table 4-6**. The NSW Archaeology (2019:366) states:

> *R107 is a large building platform with pieces of building material present across the surface. The item corresponds to the location of buildings shown on the 1911 map of Ravine. Archaeological potential across the platform is predicted to be high. The feature is part of a complex with strong historical associations and a recognised potential to address research questions relating to the theme of mining settlements. This item is assessed as having high contributory significance (particularly archaeological) to the broader setting of Struggle Street and the Lobs Hole Valley as a whole.*

For R120, the level of archaeological potential stated in Table 4-11 of the non-Aboriginal heritage assessment (Appendix G of the EIS) is high (noting however inconsistent references to limited archaeological potential in other sections of the text). This is consistent with the assessment by NSW Archaeology (2019:368) for R120 having high archaeological potential. It is described as follows (NSW Archaeology 2019:368):

> *R120 is a relatively small building platform that is partially delineated by a line of cobbles along the northern side. While the surface remains of this feature appear quite ephemeral, it is likely that areas of relatively intact archaeological deposit remain that would illuminate the nature and extent of the former building. Of particular relevance is the fact that this item represents one of the smaller buildings identified at Struggle Street, which may provide an important comparison with the more substantial building sites identified at R48, R50, R107, R109 and R110. The feature is part of a complex with strong historical associations and a recognised potential to address research questions relating to the theme of mining settlements. This item is assessed as having high contributory significance (particularly archaeological) to the broader setting of Struggle Street and the Lobs Hole Valley as a whole.*

As part of the Snowy 2.0 Main Works, direct impacts are expected at R107 and R120 and, as such, management measures proposed by NSW Archaeology (2019:462 and 505) include archival research, archival recording, salvage moveable heritage, test/salvage excavation and an interpretation plan. As stated in Table 7-3 of the non-Aboriginal heritage assessment (Appendix G of the EIS), the measures proposed are archival recording and test or salvage excavation if warranted. As such the proposed management measures for the project appear to be consistent with those proposed for the Snowy 2.0 Main Works. If archival recording and test/salvage excavation is not carried out by the Snowy 2.0 Main Works, then these measures would be implemented as part of this project if R107 and/or R120 would be impacted by the project.

The NSW Archaeology (2019) appears not to propose management measures for R128. It is unclear why this is so, and the measures proposed in Table 7-3 of the non-Aboriginal heritage assessment (Appendix G of the EIS) (archival recording and test/salvage excavation) remain appropriate for the project.

In relation to the submission querying association with the historical Snowy Hydro Scheme, Transgrid confirms that none of the five potential heritage items assessed are associated with the Snowy Hydro Scheme. This is because, as stated in Section 4.5 of the non-Aboriginal heritage assessment (Appendix G of the EIS):

> *NSW Archaeology (2019) categorised the sites in the Lobs Hole/Ravine area into complexes of sites connected with the development of the area. These were the pastoralist stage, Lobs Hole Copper Mine, "Struggle Street" (residential area on a hillside above Lobs Hole/Ravine near the mine) and the Yan complex (a complex of built and archaeological sites relating to the Yan family who lived in the area after the closure of the mine).*

Subsequent survey of these locations as part of the current project, did not alter this assessment.

Local heritage items

As stated in Section 4.6.3 of the non-Aboriginal heritage assessment (Appendix G of the EIS), there are no local heritage items listed on either the Tumut Local Environmental Plan 2012 or the Snowy River Local Environmental Plan 2013. The five potential heritage items listed above in **Table 4-6** have been assessed as not being of local heritage significance (based upon NSW Archaeology's original assessment) and have varying levels of archaeological potential. These five items are therefore not local heritage items and have been addressed as archaeological sites/features. Therefore, no consultation with local councils is warranted or has been carried out.

4.3.3.2. Mitigation

The following conditions were recommended by Heritage Council for undertaking historical archaeological excavations:

(a) *The Applicant shall nominate a suitably qualified and experienced historical archaeologist to manage the historical archaeological program according to the following conditions. This person must fulfil the Heritage Council's Excavation Director Criteria 2019 for the excavation of locally significant archaeological sites.*

(b) *An Archaeological Research Design and Excavation Methodology shall be prepared to guide the archaeological program. It shall be prepared according to Heritage Council of NSW guidelines. This document shall be submitted for comments to the Heritage Council of NSW (or its delegate) and the approval by the Department of Planning Industry and Environment (DPIE) prior to the commencement of archaeological excavation.*

(c) *A final archaeological excavation report shall be prepared within 12 months of the completion of archaeological excavation. It should include details of any significant artefacts recovered, where they are located and details of their ongoing conservation and protection in perpetuity by the land owner. Copies of the final excavation report shall be provided to the Department of Planning, Industry and Environment (DPIE), the Heritage Council of NSW and to the local Council's local studies unit.*

These conditions are appropriate for the project, and should historical archaeological excavations be required, these would be carried out in accordance with these conditions if they are stipulated.

As such, the mitigation measures have been updated to reflect this (refer to Appendix B of the Amendment Report).

4.3.4. Water quality

Comments raised in submissions relating to site water management and water quality risks, note a lack of detail on specific issues, in particular:

- There is lack of baseline water quality data, and water quality monitoring should be carried out to inform the WQOs and development of appropriate mitigation measures for the appropriate level of ecosystem protection.

4.3.4.1. Mitigation

In addition to Tumut River, the project area also contains five waterways or streams including Wallaces Creek, Yarrangobilly River, Sheep Station Creek, Cave Gully, and Lick Hole Gully and a number of unnamed gullies/drainage lines.

As outlined in Section 7.4.31 of the EIS, the construction of the project has the potential to impact the surface water quality of downstream waterways within and near the project area. This includes Yarrangobilly River, Wallaces Creek, Sheep Station Creek, New Zealand Gully and an unnamed tributary of Yorkers Creek. Potential impacts to surface water quality include:

- Erosion of soils and sedimentation of waterways
- Tannin leachate from vegetation clearing during construction and operation
- Accidental leaks or spills of chemical and fuels from incidents and accidents during construction
- Dispersal of residual ash (that is present on the ground surface from bushfires) into waterways.

The mitigation measure presented in the EIS commits to a SWMP being prepared. This will detail proposed mitigation and management measures for construction water and also include a surface water quality monitoring program. Further details on the SWMP are provided in Section 4.1.3.1 and Section 3.3.4.2 of the Amendment Report.

The surface water quality monitoring program would be implemented to gain an appreciation of background water quality, to observe any changes in surface water quality that may be attributable to the project and inform appropriate management responses. The surface water quality monitoring strategy is provided in Appendix E of the Amendment Report and would form the basis of the surface water quality monitoring program. The ecosystem protection limited adopted for the surface water quality monitoring program is 95% species protection limit for waterways that flow through the Bago State Forest, within and in proximity to project area west and 99% species protection limit for all other waterways near the project area within KNP.

The key objectives of water quality monitoring of surface waters are to:

- Protect downstream aquatic ecosystem
- Maintain visual amenity
- Maintain downstream water quality for primary and secondary contact recreation, water supply and consumption of aquatic foods (cooked).

The implementation of water quality monitoring will assist in ensuring that both the construction and operation of the project will minimise potential negative impacts on sensitive receiving environments.

The surface water quality monitoring program will be carried out during the pre-construction, construction, and operation of the project.

4.3.5. Flooding

Comments raised in submissions relating to flooding include:

- The EIS and Hydrology Assessment does meet the SEARs for flooding
- The recommendation that quantitative flood modelling and assessments must be completed during the detailed design be included as a CoA.

4.3.5.1. Mitigation

While the EIS determined that the flood impacts are likely to be minor, a quantitative flood modelling and assessment will be completed for new infrastructure such as temporary and permanent access tracks and bridges/culverts that cross drainage lines. The assessment will determine if there any detrimental changes in potential flood effects from the project, on any other developments or land, including redirection of flow, flow velocities, flood levels, hazards and hydraulic changes. If any flood impacts are determined to be real and prejudicial, then the designs would be modified to reduce the impacts to an acceptable level.

The suggested CoA for quantitative flood modelling and assessment reflects the commitments made in the EIS. Transgrid acknowledges the CoA recommendation.

4.3.6. Land

Comments raised in submissions relating to land include:

- There is a Crown Public Road that may be affected by the proposal
- A new Exploration Licence overlies the proposed substation and part of the project area west
- Any economic loss needs to be addressed as part of the land acquisition process.

Responses to these matters are provided below.

4.3.6.1. Construction impacts

The nearest section of crown public road is located about 1.8 kilometres to the west of the project. No impacts are expected to this road, as this road is not within the project area, nor would it be used as a transport route.

There is a paper road (a road that appears on maps but has not been constructed) that appears to be owned by Crown Lands that crosses project area west between Structure 6 and Structure 7. This paper road is not within the disturbance area and the transmission lines would be strung over it. Therefore, no impact would be expected.

4.3.6.2. Operation impacts

Transgrid has contacted the licence holder of the new exploration licence (EL 9056) which overlies the proposed substation and western portion of the project area on 3 May 2021 to determine their level of interest in this site. A response was received on 5 May 2021 to confirm that the level in interest in that particular area of EL9056 is very low and the licence holder has no objection to the project.

4.3.6.3. Other – Economic loss

The project would not require the acquisition of privately owned land. It would, however, involve the acquisition of land from FCNSW and NPWS.

The substation site is expected to be acquired from FCNSW as freehold land. The land subject to the transmission connection corridor and the access tracks would be acquired in the form of easements with NPWS and FCNSW.

Following construction, the easements would be sought from NPWS and FCNSW to provide Transgrid the necessary property tenure and rights to access, operate and maintain the connections assets. The final compensation package would be determined in agreement with NPWS and FCNSW.

The compensation package for FCNSW would consider the economic loss of long term forestry uses of the land and replacement land.

4.3.7. Transport

Comments raised in submissions relating to transport were that:

- Transport through Batlow can be avoided through the use of sealed roads owned by FCNSW
- Concerns regarding heavy vehicle movements between project area east and project area west via Link Road and Elliott Way

- Concern about the impact on roads within KNP (namely Elliott Way) and no upgrade works being identified
- Potential traffic safety risks due to the project access tracks intersecting with Elliott Way
- Road safety is a concern and that a fatigue and weather condition management plan is required prior to the construction of the project
- Project haulage routes are confirmed and any road improvements required for the project are identified and considered within this assessment and are not dealt with under different approval instruments
- Retain all current Forestry road access from Elliott Way to Bago and Maragle State Forests for forest and fire management purposes
- Concerned that this project would delay the opening of Elliott Way.

Responses to these matters are provided below.

4.3.7.1. Construction and operation impacts

Transport routes

As detailed in Section 5.4.9 of the EIS, the anticipated haulage routes for heavy vehicles carrying materials and equipment to and from the project area are as follows:

- **Project area west**: It is expected that majority of materials and equipment would travel along Hume Highway, Snowy Mountains Highway, Batlow Road, Tooma Road and Elliott Way
- **Project area east**: It is expected that the majority of materials and equipment would travel along Snowy Mountains Highway (via both from Cooma and Tumut), Link Road and Lobs Hole Ravine Road.

These transport routes would remain unchanged for the majority of heavy vehicles.

In Section 5.4.9 of the EIS, it was assumed that oversize overmass (OSOM) vehicles carrying high mass substation equipment (namely transformers and reactors) would travel from Port Kembla to the substation in project area west. It is now assumed that the Port of Newcastle could be the point of delivery of key high mass substation equipment. As such a transport haulage route assessment for OSOM vehicles traveling from Newcastle has been prepared. The route assessment identified the following road modification works would be required along the preferred route from Port of Newcastle to the proposed substation site:

- Lowering of sections of the median strip on Albury Street and Bridge Street in Tumbarumba and signage to be made removable to support the passing of the OSOM vehicles through the township
- Modification of the intersection of the substation site access road and Elliott Way to facilitate access to the substation. This is required to support the swept path of the OSOM vehicles entering the substation access road off Elliott Way.

Further details on the route assessment are summarised in Section 6.5.2.2 of the Amendment Report.

As stated in Section 7.6.3 of the EIS, a Construction Traffic Management Plan (CTMP) would be developed, and any disruptions would be managed in accordance with the CTMP. These disruptions are expected to be minor and limited in duration and attributed to:

- Traffic controls (if required) put in place during the stringing above the Elliott Way
- OSOM vehicle movements delivering large plant and equipment
- The construction of the substation access road.

Transgrid would advise FCNSW and NPWS of any disruptions to the local road network that would occur throughout the construction period.

FCNSW have advised that transport through Batlow could be avoided through the use of sealed roads owned by FCNSW. Transgrid and its contractor would investigate the use of these alternative routes as part of construction planning in consultation with FCNSW.

Transgrid would commit to a road dilapidation survey of Elliott Way and other potential local roads (to be agreed to with NPWS and Council) utilised by the project being carried out prior to commencing construction.

Traffic movements along Elliott Way

Once repairs to Elliott Way, Link Road and Goat Ridge Road are complete following the damage from the Dunns Road bushfire, some light traffic movements would occur along these roads for access between project area east and project area west. These light vehicle movements between project area east and west are expected to be intermittent,low in frequency and limited to up to ten movements per day. They would be associated with site inspections, minor deliveries or movements of construction personnel between the work areas. No heavy vehicle movements would occur between project area east and project area west.

The extent of heavy vehicle movements along Elliott Way would be limited to heavy vehicles servicing the construction activities associated with the substation and the transmission connection west of Talbingo Reservoir. During peak construction, heavy vehicle movements along Elliott Way associated with the substation construction are expected to be up to 75 movements per day, while heavy vehicle movements associated with the construction of the transmission line are also expected to peak at up to 75 movements per day. However, outside of the construction peaks, typical heavy vehicle movements along Elliott Way for the substation and transmission line construction are expected to be up to 30 and 50 movements respectively.

As detailed in **Section 4.1.3.2**, up to eight truck movements per day would be required along Elliott Way to obtain water from the Snowy Hydro T2 Tailbay site or the Paddy's River Flat Campground, refer to **Figure 3-4**. The water trucks would use Elliott Way and Tooma Road to access the water extraction point near Paddy's River Flat Campground, while water trucks accessing the Snowy Hydro T2 Tailbay water extraction site would only use Elliott Way. No truck movements would occur along Elliott Way beyond the T2 Tailbay site.

The vehicle movements along Elliott Way and all public roads associated with the project would be consistent with the estimated traffic movements as detailed in Table 5-4 of the EIS.

Works on and above Elliott Way

Conductor and earthwire stringing above Elliott Way would occur at three locations within the project area west, refer to **Figure 3-4**. This would not require the closure of these roads, however, would involve traffic management and/or physical protection to be installed to prevent the wires making contact with vehicles in the unlikely event of failure during the stringing process. Stringing above each section of Elliott Way would be short in duration (matter of hours) for each conductor and earthwire. During this time, the road is able to be opened to traffic as required to let vehicles through once works are made safe, in consultation with the traffic controllers. In total, twelve conductors and four earthwires would need to be strung.

Access track interface with Elliott Way

Concern was raised by NPWS that the access track from Elliott Way leading to Structures 12 and Structure 13 (first two structures on the western side of Talbingo Reservoir) may present some road safety risks due to the intersection of the access track with Elliott Way being located along a curve in the road. To allow a safer access and egress to and from Elliott Way, measures would be incorporated into the final design under

consultation with NPWS to enable vehicles to safely stop for personnel to open and close the access track gate. Such measures may include:

- The placement of the gate at a suitable distance along the track as to avoid vehicles parking on/adjacent to Elliott Way
- Incorporation of a pull over bay alongside the existing Elliott Way road surface.

NPWS also requested amendments to the following intersections with Elliott Way.

- Access to Structure 17 – Access track be shifted further east to improve the line of sight for vehicles travelling along Elliott Way. Transgrid would further consult with NPWS as part of detailed design to incorporate their preferred alignment in manner that is consistent with the project disturbance area and the CSSI approval (should the project be approved).
- Access to Structure 15 and Structure 16 – Access track be shifted further west to utilise the existing batter slope off Elliott Way. Further review of the option was carried out and it was identified that due to the topography and larger cuts, additional earthworks would be required. As such the current access track alignment as per the concept design shown in **Figure 3-4** remains the preferred alignment.

Gates would be installed at the intersections of the new access track with Elliott Way to restrict unauthorised access. In addition, appropriate safety measures including the use of guard rails would be incorporated into the design where required.

Road safety

Access along Elliott Way would not be restricted for management and emergency management activities and long-term access would be improved once construction works are complete.

To ensure safety, appropriate driver induction, training, safety measures and protocols would be outlined in the CTMP and adhered to by the construction workforce. The CTMP would also include:

- A fatigue and weather condition management plan for both light and heavy vehicles that details driver protocols for both driver fatigue and adverse weather
- The inclusion of the measures to address the road safety issues as identified in Section 9 of the road safety audit which was prepared as part of the EIS. It should be noted that the road safety audit did not identify any significant road upgrade requirements to address any of the identified road safety issues. The measures to improve road safety were generally associated with:
    - Provision of signage in potentially hazardous sections of road
    - Remove unprotected non-frangible hazards such as rocks, fallen trees and branches from the clear zones of the carriageways
    - Improvements to line marking
    - Repair of minor damage to sections of the road pavements (including potholes, unsealed road shoulders, shoves, edge break and polishing)
    - Trimming of overhanging tree branches.

Any measures to address road safety issues along relevant Classified Roads (namely Snowy Mountains Highway) and Council roads would be carried out under consultation with TfNSW and Council and in accordance with Section 138 of the Roads Act.

Forestry access road

During construction, approximately 70 metres of the existing FCNSW access road off Elliott Way would be upgraded to facilitate construction and provide permanent access to the substation site during operation. During the FNSW access road upgrade, there would be possible disruptions to FCNSW activities around the immediate area. FCNSW would be notified of any potential disruptions prior to the works starting and the disruptions would be managed in accordance with the CTMP.

While the use of this section of the Forestry access road would be affected during upgrade works, access would not be restricted to access for management and emergency management activities and long-term access would be improved once construction works are complete.

4.3.7.2. Other – opening of Elliott Way within KNP

Elliott Way within KNP has been shut since the Dunns Road bushfire which occurred between December 2019 and January 2020 due to extensive damage to the slopes and road as a result of the bushfire. The damage caused by the bushfire is shown in **Photo 4 1**.

Access via Elliott Way is critical for access to the project area during construction and the majority of materials and equipment for the project area west would travel along Hume Highway, Snowy Mountains Highway, Batlow Road, Tooma Road and Elliott Way. The section of Elliott Way requiring repair only affects access between project area east and project area west and does not affect access to any part of project area west coming from Tumbarumba.

The repairs required for the reopening of Elliott Way is beyond the control of Transgrid. At the time of writing, NPWS advised that road works had started on Elliott Way. These works are expected to be complete by the later part of 2021 with the road opening back up to traffic soon after. The project is not expected to delay the reopening of Elliott way.

Once repairs to Elliott Way, Link Road and Goat Ridge Road are complete following the damage from the Dunns Road bushfire, some traffic movements would occur along these roads for access to the project area east, the project area west and the water extract location near Snowy Hydro T2 Tailbay. These traffic movement are discussed in **Section 4.3.7.1**.

Photo 4-1 Elliott Way within KNP post fires

(source: NPWS)

4.3.8. Landscape and visual

Comments raised in submissions relating to the landscape character and/or visual impact of the project included:

- The visual impact of the proposed overhead transmission lines would be far greater than the existing single-circuit transmission lines through the KNP and greater than what is stated in the LCVIA, and shown in the photomontages
- The structures and lines would be visible over 300 square kilometres
- Very little written in the EIS about the visual intrusion of the transmission lines
- Disagreement with the assumptions in the EIS that regenerating vegetation after the Dunns Road fire would provide screening for the project infrastructure
- Disagree with the assumptions that Lobs Hole Road and Mines Trail would experience low visitor numbers upon reopening to the public
- The visual impact of the massive transmission lines will never be mitigated.

Responses to these matters are provided below.

4.3.8.1. Construction and operation impacts

Visual impact assessment

The EIS provided a discussion on visual impact assessment in the body of the report, as well as a LCVIA provided as Appendix H. The LCVIA was prepared as part of the EIS which responded to the project SEARS.

The LCVIA determined that the introduction of new permanent elements into the landscape would result in a change to the landscape character and visual setting of KNP and Bago State Forest. The greatest visual impact would occur where the transmission corridor is established and requires the clearing of vegetation in proximity to publicly accessible roads and viewpoints such as short sections of Elliott and along some sections of the Lobs Hole-Ravine 4WD trail. Opportunities for the mitigation of visual impacts are limited due to the nature of the existing topography and vegetation limiting the introduction of landscape screening.

The LCVIA used a worst-case conservative assessment and assumed that all structures would be up to 75 metres in height. As detailed in the EIS all structures would be less than 75 metres in height. In terms of structure height, for most viewers, where a transmission structure is visible, the height of the structure is not readily discernible, i.e. the difference in height between a 50 metre and 75 metre structure is not perceptible. Where structures are visible, it is the visibility of structures to views that would contribute to the visual impact, rather than height of the structure.

The concern that the visual impact from the project transmission lines (in comparison to existing transmission lines throughout KNP) would be greater than stated in the LCVIA, is not supported by either the technical photomontages prepared for this project nor examples of similar infrastructure in other areas.

The photomontage methodology utilised for this project has been tested through a range of projects in the NSW Land and Environment Court of New South Wales and the NSW Planning Assessment Commission (now the NSW Independent Planning Commission) forums. In all forums, photomontages have been proven to be both technically and perceptually accurate when viewed and reproduced in the manner outlined in the LCVIA.

With regard to the visual assessment, there are many examples where transmission lines and much larger wind turbines of various sizes are visible in the same or similar views, as depicted in this assessment. This

is because it is not only the size of the infrastructure that determines its visual impact, rather it is the presence of the infrastructure and change in the view, considered in the context of factors including distance, viewer numbers, surrounding land-use and duration. The size of the new structures is considered by the LCVIA, such as where they form horizon elements from certain viewpoints over distance.

Project visibility and intrusion

Section 3.2 of the LCVIA (Appendix H of the EIS) identified the visual catchment of the project, including determining the Zones of Visual Influence (ZVI) and theoretical visibility of the project infrastructure based on a considered worst case maximum height of 75 metres for all structures. As shown in **Table 4-7**, the majority of the structures would be less than 60 metres and the average height is 56.43 metres.

The ZVI provides a guide to the potential visual impact based solely on distance. ZVI can be determined based upon the distance of the viewer to a transmission structure. As a person moves toward or away from a structure, the visual impact would differ as the apparent height and scale of the structure would change. Various ZVI have been calculated based upon the parameter of the human vision. The ZVI are outlined in **Table 4-7**.

The view shed relevant to the assessment of the project is based on the distance at which the project takes up 0.5° (degrees) of the vertical field of view. This was determined to be 7.84 kilometres. This is the ZVI and visual study area which is about 214 square kilometres and is shown in Figure 3-4 of the LCVIA. At 7.84 kilometres and beyond, the project would be visually insignificant as shown in **Table 4-7**.

Table 4-7 Zones of visual influence

Distance to transmission structure	Vertical angle of view (°)	Zones of visual influence
>7.84 km	<0.5	**Visually insignificant** A very small element in the viewshed, which is difficult to discern and will be invisible in some lighting or weather circumstances.
3.92-7.84 km	0.5-1.0	**Potentially noticeable, but will not dominate the landscape – Extent of the project viewshed** The degree of visual intrusion will depend on the landscape sensitivity and the sensitivity of the viewer; however, the transmission structures do not dominate the landscape.
1.57-3.92 km	1.0-2.5	**Potentially noticeable and can dominate the landscape** The degree of visual intrusion will depend on the landscape sensitivity and the sensitivity of the viewer.
782 m- 1.57 km	2.5-5.0	**Highly visible and will usually dominate the landscape** The degree of visual intrusion will depend on the transmission structures' placement within the landscape and factors such as foreground screening.
782 m	>5.0	**Will always be visually dominant in the landscape** Dominates the landscape in which they are sited.

As described in Section 3.1 of the LCVIA, the Seen Area Analysis (SAA) identified locations where the project theoretically may be visible. The actual project visibility depends on the character of the landscape, such as intervening topography and vegetation that may filter or screen views toward the project.

As such, the SAA method does not take into account potential intervening vegetation, existing structures or minor topographic changes that may further filter or screen views to project components. For this reason, Figure 3.5 of the LCVIA which was generated by GIS using SAA is a conservative visibility map and is useful to determine locations from which to assess the potential visual impacts of the project. This figure does not mean that the project would actually be visual from all these locations.

The results of the project LCVIA do not support the submission stating that the project structures and overhead lines would be visible over 300 square kilometres. Refer to the LCVIA provided as Appendix H of the EIS for full details on the project visibility.

Vegetation regeneration and screening

The photographs taken from around the project area for the LCVIA prior to Dunns Road Fires and the follow up imagery taken post-bushfires do show early vegetation regeneration, refer to **Photo 4-2** to **Photo 4-5**. As demonstrated by the photos before the bushfires and photos after the bushfires, it can be seen that the remaining vegetation still has a screening and filtering effect when viewing across the landscape.

Photo 4-2 VP 2 – Elliott Way/Boundary Road looking west- prior to 2019 bushfire

Photo 4-3 VP 2 – Elliott Way/Boundary Road looking west – post bushfire

Photo 4-4 VP 7 – Ravine Road looking west to north – prior to 2019 bushfire

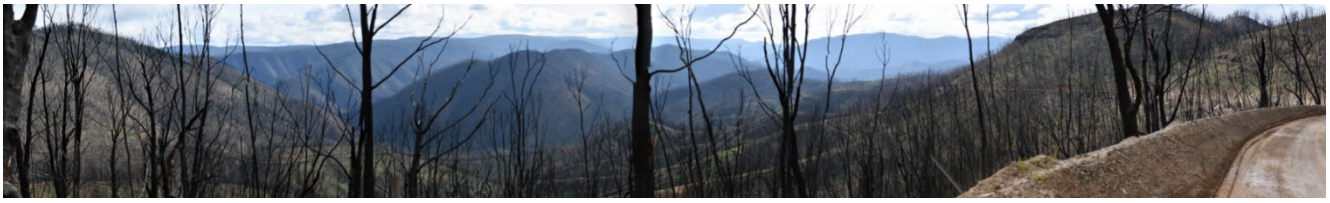

Photo 4-5 VP 7 – Ravine Road looking west to north – post 2019 bushfire

In many areas, vegetation had begun to regenerate, as viewed from site visits four months following the fires. It is noted that in some areas, vegetation will take longer to re-establish due to the variation in the intensity of the burns. Areas included around the substation were only moderately impacted, and epicormic sprouting vegetation has already begun filtering views four months following the fire.

As demonstrated in the pre-fire imagery and other locations across NSW, vegetation does not need to be the same height as the infrastructure to screen views. The angle at which the viewer is experiencing the view dictates the level of screening, not the vegetation height. This is supported by the imagery provided in the LCVIA.

Lobs Hole Road and Mines Trail

The LCVIA considered that the Lobs Hole Ravine area would be rehabilitated following construction of Snowy 2.0, and that new campgrounds would be established and Lobs Hole Ravine Road would be upgraded as part of Snowy 2.0. The road upgrades would allow for more vehicles, including caravans and campers, to access this area. As such, the viewer numbers are expected to increase.

The LCVIA considered that the Lobs Hole Road and Mines Trail area would continue to be a remote location that contains no formal campground amenities, signposts etc, unlike the nearby Yarrangobilly Caves, or the campgrounds adjacent to the Talbingo Reservoir boat ramp included within the LCVIA. As such, the visitor numbers would still be relatively low by NSW standards.

Based on the existing conditions and available data, low viewer numbers is an acceptable rating for a remote wilderness location with no formal amenities, signage or proximity to a major road.

4.3.8.2. Mitigation

A Supplementary LCVIA was prepared for the project to:

- Review the mitigation measures that are available for the project
- Prepare photomontages showing the outcomes of these mitigation measures
- Carry out a qualitative review of the photomontages
- Provide mitigation measure recommendations based on the qualitative review.

The Supplementary LCVIA provided in **Appendix E** are summarised below.

Mitigation options

The visual impacts of the project are not limited solely to the visibility of the structures. Other factors influencing visual impacts include:

- The nature and duration of views that may include the project
- Visual scale or prominence attributed to distance
- The number of people who may see the project.

The first principle for mitigating visual impact relates to siting of the project to avoid sensitive landscapes such as KNP, key viewing locations and sensitive receptors. This project and Snowy 2.0 are not able to avoid KNP and therefore avoidance of significant and sensitive landscapes is not possible and mitigation measures need to be considered.

For this project, mitigation measures must consider the impact the project would have on the change in views, in particular due to the project and the locations or the setting where views have changed. The main components of the project that would change the view include:

- Project alignment and structures: The project alignment, placement of structures and relative structure heights have been established based on the project design, topography, technical assessments carried out as part of the EIS and the project options and alternatives assessment process. As such no further mitigation is available to reduce the impact of the project alignment
- Cleared transmission corridor / easement: The extent of clearing of the transmission corridor has been partly avoided and minimised through the overhead project design, the location of the structures and structure heights. That is, the positioning of structures on hilltops and ridgelines would allow the overhead transmission lines to span large vegetated areas, which would result in greater retention of vegetation on hillsides and valleys. The clearing requirements of the project have reduced as discussed in **Section 1.3**, as such no further mitigation is available to reduce the clearing required
- Supporting structures: The project is an above ground transmission connection design, hence the visibility and visual impact of structures is unavoidable. Where structures are visible, they would be visible over several kilometres.

The Supplementary LCVIA undertakes an assessment of mitigation options to assist to mitigate the visual impact of the project. The mitigation options include structure design (structure types and structural treatments which are summarised below:

Structure design

The Supplementary LCVIA considered the visual impact between two structure types; monopoles and lattice structures.

From close distances, monopoles are visually simpler and therefore less cluttered through their simpler design, as shown in **Figure 4-2**. Monopoles are typically used in transmission lines when there is limited maximum span width (structure spacing). Steel lattice structures are used where there is greater span between the structures. Due to span limitations for this project, a double circuit monopole design may require additional structures compared to a steel lattice structures design. For example, for larger spans such as across ravines, Talbingo Reservoir or other areas under high tension (such as directional changes in the line), multiple monopoles (up to four) may be required to replace a single lattice structure to withstand high loading in such locations. These additional structures would contribute further to the visual impacts.

It should be noted that a change in structure type within short distances (e.g. steel lattice structures to monopoles poles or vice versa) or the introduction of monopoles to a view that already includes existing lattice structures, may contribute to visual clutter due to the differing and conflicting structure types. Similarly, the introduction of monopoles to sensitive or key views that already includes steel lattice structures within existing transmission connections (such as Line 2) may highlight the addition of new project elements to an area. That is introducing structure types that are different in the same view would more clearly highlight the introduction of a new project. Therefore maintaining a structure type consistency would make it more difficult for visitors not familiar with the area to distinguish between the transmission infrastructure associated with Snowy 2.0 compared to the existing Snowy Scheme transmission infrastructure within KNP.

Therefore when selecting the structure type, consideration should be given to the potential of visual clutter created through structure design and multiple structure types visible in the same view.

The determination of visual impact is only partly contributed to by the introduction of a structure to a view. The overall visual impact must also consider other factors such as the scale and prominence of the structure and the sensitivity of the viewing location.

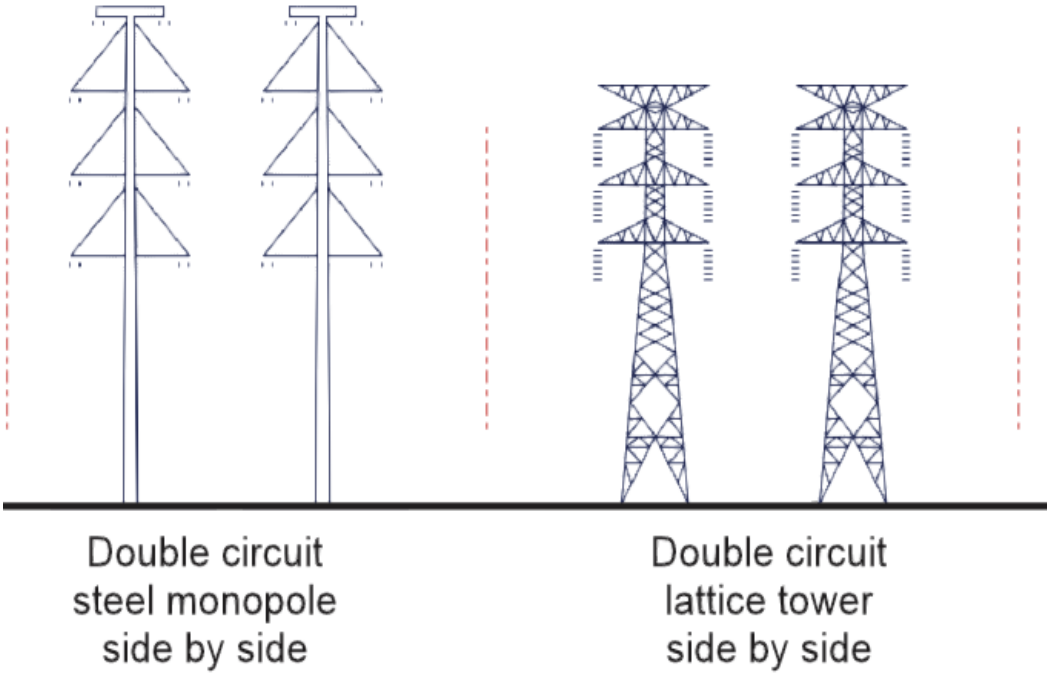

Figure 4-2 Transgrid structure designs

(source; modified from https://www.transgrid.com.au/media/b2hpaiso/high-voltage-transmission-line-factsheet.pdf)

Structural treatments

The Supplementary LCVIA also considered the structural treatments available to assist in reducing the visual mitigation including pre-dulling the galvanised steel of the structures and painting the structures a similar colour to the background such as vegetated hills.

There are limited measures that can assist in mitigating structures that silhouette against the sky such as areas where structures are located along a ridgeline, an escarpment or viewed at low angles. This is partly due to constantly changing factors such as sun angle and cloud cover. When the sun is behind structures, the visible part of the structure would be in shade and would always appear black. When the sun is in front and shining on structures, the structures would contrast against a blue sky.

Steel work used for transmission structures are traditionally hot dip galvanized for protection against corrosion to increase their service life. Freshly galvanised steel has a bright reflective sheen. This lustre makes new structures often more noticeable in views due to the bright and sometimes reflective surfaces. When galvanised steel is exposed to the environment, galvanising would revert to a matte dull grey appearance reducing the apparent obviousness and reflectivity of coated surfaces. Dulling of galvanised steel can be advanced and undertaken prior to delivery of the steel components or once constructed.

Weathering can be accelerated at the coating stage prior to delivery of the steel components or once constructed to reducing contrast and visual prominence that would otherwise be achieved over several months. **Photo 4-6** shows an example of partially constructed galvanised steel structure adjacent to an existing aged in place lattice structure. This example demonstrates ability for duller structures to be visually absorbed when viewed against a backdrop of vegetated and cleared hills.

Photo 4-6 Example of the Initial construction of new galvanised structure adjacent to existing structure which has subject to natural environmental ageing

(source: Options Report (EMM, 2021))

Painting of structures (over galvanized coating) can also be applied to further assist structures to 'blending' into the surrounding landscape where block colours are selected from background elements in views such a vegetation. In areas such as KNP, dark or olive green would be a suitable colour to be applied. An example of painted structures is shown in **Photo 4-7**. This photo is of the existing 220 kV Dartmouth - Mount Beauty transmission line within the Alpine National Park near Mount Beauty.

Painting of structures is less common due to requirement for access and the on-going maintenance burden imposed by the relatively short-lived paint coatings and the need for crews to undertake high-work in-order to restore the painted coatings. It should be noted that the repainting of the structures over the life of the project would need to be timed with line outages.

Photo 4-7 An example of painted steel lattice structures

(Source Tetra Tech Coffey)

Summary of the mitigation option review

The LCVIA included photomontages from five locations (VP7, VP9, VP 11-VP13) where the project would be visible. As part of the Supplementary LCVIA, additional photomontages were prepared for the same locations to include potential mitigation measures (such pre-dulling galvanised steel, painting the structures and the use of monopoles) to assist in the assessment of the mitigation options. Refer to Chapter 3 and Appendix A of the Supplementary LCVIA for these photomontages and the full discussion. A summary of the findings is summarised below.

The Supplementary LCVIA identified that the residual options that are available to assist with mitigating the visual impacts of the project would be limited to structure design and surface treatment. As such the Supplementary LCVIA determined that:

- From close distances, monopoles are visually simpler and therefore less cluttered through their simpler design. However, where structures are visible in longer range views or silhouetted against the skyline, there is little apparent difference in visual scale or prominence between a monopole or lattice structure
- For both close range and distant views, the assessed level of visual impacts would not change materially through the inclusion of either monopoles or steel lattice structures. This is due to the installation and visibility of structures in a landscape and views that are considered to be highly sensitive due to the scenic quality and amenity of the area, and the high sensitivity of the key user groups who would take in views of the project
- In the forefront of a vegetated landscape the painted structures were less obvious in views than dull galvanised structures
- Where dull-galvanised structures are located on ridgelines, elevated locations or silhouette against the horizon they are less noticeable than painted structures. This was found to be apparent for both the monopole and the steel lattice structures
- Of the 13 viewpoints considered in the LCVIA, Lobs Hole Ravine Campground (VP12) was the only sensitive location within KNP where visitors would take in views of the project for an extended period of time. In this location the existing Line 2 structures are visible from a number of locations. As such the inclusion of steel lattice structures rather than monopoles around Line 2 and Lobs Hole Ravine would potentially help reduce visual impacts, as the design mimics the design of existing structures. This would

assist in absorbing new structures into the existing setting of the area. Other mitigation options for this sensitive location are discussed below.

- For the other 12 VPs, where the majority of views of the project would be fleeting from roads, trails or opportunistic, there would be little to no improvement in views or visual impact to be gained through an altered structure design such as monopole. However there may be some benefit through the pre-dulling the galvanised steel of the structures to remove the sheen of new structures.

Mitigation for the Lobs Hole Ravine area.

As discussed in the Supplementary LCVIA and above, structures that are located on elevated and prominent locations would be less apparent when pre-treated to remove the sheen of hot-dip galvanised steel. Similar visual impact reductions would be gained through painting of the structures that would be viewed against a vegetated backdrop. As such **Table 4-8** presents the proposed treatments to each numbered structure pair through Lobs Hole Ravine to assist with reducing the visual obviousness of structures based on background elements.

Table 4-8 Suggest structure treatments

Numbered Pairs	Background	Treatment type
1L & 1R	Vegetated Hills	Paint: Olive Green
2L & 2R	Vegetated Hills	Paint: Olive Green
3L & 3R	Vegetated Hills	Paint: Olive Green
4L & 4R	Part sky	Pre-dull galvanised steel
5L & 5R	Sky	Pre-dull galvanised steel
6L & 6R	Sky	Pre-dull galvanised steel
7L & 7R	Vegetated Hills	Paint: Olive Green
8L & 8R	Vegetated Hills	Paint: Olive Green
9L & 9R	Sky	Pre-dull galvanised steel
10L & 10R	Sky	Pre-dull galvanised steel

Snowy Hydro is required to prepare a rehabilitation management plan, visual impact management plan and a recreation management plan as part of the Snowy 2.0 post approval commitments. As such, there would be benefit in the project infrastructure being considered in the preparation of these management plans to assist screening of structures in the Lobs Hole area to help improve visual the visual amenity of the future recreational area. Such consideration would include design and layout of the future recreational and camping area, including orientation of recreational assets, camp sites and planned revegetation.

4.3.9. Hazards and risks

Submissions regarding hazards included:

- FCNSW must retain all current road access from Elliott Way to Bago and Maragle State Forests for forest and fire management purposes
- Bushfire protection measures need to occur annually, agreed by FCNSW, then funded and implemented by Transgrid. This includes ongoing management of 'hazard trees' on a risk basis, at Transgrid's cost
- Preventative fire mitigation practices within FCNSW's Forest Practices Codes should be applied to the construction and maintenance works of the project.

Responses to these matters are provided below.

4.3.9.1. Other – fire management

As outlined in **Section 4.3.7**, access for management and emergency management activities would be unaffected as there are no plans to close any of the roads to management or emergency vehicles.

Transgrid acknowledge that bushfire risk associated with the project and existing transmission assets within and in proximity to areas of State Forest is a key concern of FCNSW. Transgrid is committed to carrying out annual vegetation assessment and maintenance, at its cost, when required under consultation with FCNSW (and NPWS) along the transmission line easement and the APZ surrounding the substation to ensure regrowth remains within acceptable limits from the overhead transmission lines and electrical equipment. The ongoing maintenance of the substation APZ, easement and hazard trees is detailed in Section 3.3 of the Amendment Report.

As outlined in Section 7.10.4 of the EIS, a Prepare-Act-Survive bushfire response plan will be prepared for the project in consultation with NPWS, FCNSW and Snowy Valleys Bush Fire Management Committee.

The fire prevention/mitigation strategies within Bago State Forest would be generally in accordance with Forest Practices Codes including the *Standard Operating Procedure - Plantation Harvesting, Haulage and Site Preparation Fire Restrictions* (Fire Prevention 19/51).

4.4. Project evaluation

Some of the public and organisation submissions challenged the project's justification, and whether it is of public interest and can be considered as ecologically sustainable development (ESD).

Responses to these matters are provided below.

4.4.1. Project justification

The themes of the submissions received regarding the need and justification of the project included:

- The Snowy 2.0 Transmission Connection Project is not in the public interest. The ultimate determinant of what is in the public interest is in the KNP PoM, which prohibits additional overhead transmission lines. More overhead transmission lines are therefore not in the public interest
- Comments raised in submissions called for the project to be rejected as it is not considered ESD
- The cheaper up-front cost appears to be the primary reason/justification for overhead transmission, rather than environmental impacts. Cost should not be a consideration in the EIS process. Approval of the project would set an appalling precedent for further high impact transmission connections in the most environmentally sensitive landscapes within our State
- The EIS makes no argument about the potential financial benefits of overhead transmission.

Responses to these matters are provided below.

4.4.1.1. Public interest

Snowy 2.0 is the largest committed renewable energy project in Australia. It would provide an additional 2,000 megawatts (MW) of dispatchable generating capacity and make approximately 350,000 MWh of large scale storage available to the NEM at any one time. This could power three million homes over the course of a week. As Snowy 2.0 is a new asset, a new transmission connection is required for the electricity generated by Snowy 2.0 to be transmitted into the existing network and NEM.

The project therefore benefits the public interest by enhancing overall energy security, and facilitating the transmission of significant renewable generation that is essential for the transition towards a low carbon future.

NSW is likely to have one of the greatest requirements for energy replacement and capacity. Transgrid's *Transmission Annual Planning Report* (Transgrid, 2020) notes that over 30% of the coal fired generation capacity in NSW is scheduled to retire over the next decade. As the likelihood of new coal-fired power stations is considered to be low, much of the replacement of coal-fired generation would be from renewable sources and to a lesser extent gas.

Renewable generators, such as solar and wind farms, provide an intermittent source of electricity whereby the power produced is dictated by the availability of the renewable energy source. To reliably supply customer demand, wind and solar farms need to be coupled with energy storage such as pumped hydro-electric storages like Snowy 2.0. Snowy 2.0 allows excess renewable energy to be stored and used when required to supply major load centres like Sydney and Melbourne during periods of high demand.

The energy generation and storage that will be provided by the Snowy Scheme and Snowy 2.0 is considered essential to maintaining reliable electricity supplies to the NEM as coal-fired power stations are closed. Supply is contingent on being connected to the NSW transmission system via high capacity, high availability transmission lines.

To summarise, most energy used in NSW comes from non-renewable sources. These power sources contribute to greenhouse gas emissions, as well as local and regional air pollution. The project would connect Snowy 2.0, provide much needed energy to the growing NSW population as well as reducing reliance on non-renewable energy, potentially decreasing greenhouse gas emissions and air pollution over time.

Based on the comprehensive review and further analysis of 12 options, Transgrid have landed on a solution based on the three main evaluation criteria (refer to **Figure 3-3**) which balances cost and avoids and minimises impacts as far as is reasonably practicable. Refer to the Options Report which is provided in **Appendix D** and summarised in **Section 3.2**.

The evaluation criteria for the options assessment and analysis included the consideration of environmental impacts, the cumulative infrastructure need for HumeLink and keeping as much infrastructure as possible outside of KNP. The Options Report clearly demonstrates that Option 4, is the optimal solution which appropriately balances impacts on the environment, technical feasibility and cost. This option which consists of an overhead transmission connection connecting the Snowy 2.0 cable yard within KNP to Line 64 via a new substation located within Bago State Forest (the project). The project keeps as much infrastructure needed for the project and HumeLink as possible outside of KNP.

The project, as an overhead transmission connection has been designed to avoid and minimise impacts where possible in accordance with the principles of ESD and throughout the design process, the objective was to identify and avoid sensitive locations, to minimise the construction footprint and maintain as much of the existing natural environment as is reasonable and feasible.

The long-term benefits of the project, when taken together with Snowy 2.0 Main Works project, are considered to be in the public interest.

4.4.1.2. Ecologically sustainable development

Transgrid acknowledges that its environmental assessment of the project must address the principles of ESD as those principles are expressed and applied by the EP&A Act. The EIS considered the principles of ESD and concluded that the project is consistent with the principles of ESD. For example:

- The project connects Snowy 2.0 to the NEM and thereby facilitates reliable renewable energy, and contributes to reduced reliance on high emission energy generation sources, for the benefit of present and future generations (*consistent with the principle of intergenerational equity*)
- A fundamental consideration in the design and assessment of the project was the aim of identifying, avoiding, minimising and mitigating impacts (*consistent with the principle concerning conservation of biological diversity and ecological integrity*)
- Transgrid is committed to offsetting unavoidable impacts, and has embraced its responsibility for rehabilitation, ongoing maintenance, and implementation of a suite of other mitigation measures (*consistent with the principle concerning improved valuation, pricing and incentive mechanisms*).

Further consideration of the main principles supporting the achievement of ESD and how the project responds to these principles are discussed below.

Precautionary principle

The precautionary principle deals with reconciling scientific uncertainty about environmental impacts with certainty in decision-making. It provides that where there is a threat of serious or irreversible environmental damage, the absence of full scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation.

This principle was considered during development of the project which included an options analysis (refer to Chapter 3 of the EIS, **Section 3.2**, and the Options Report provided in **Appendix D**). The evaluation criteria for the further options assessment and analysis included the consideration of environmental impacts, the cumulative infrastructure need for HumeLink and keeping as much infrastructure as possible outside of KNP. While Option 4 would result in additional infrastructure and associated environmental impacts within the KNP, this option would keep the HumeLink connections outside of KNP. The further options assessment and analysis clearly demonstrates that Option 4, which is an overhead transmission connection to the new substation, located adjacent to at Line 64, is the preferred option as it is the optimal solution which balances technical feasibility, cost and environmental impacts.

The project, as an overhead transmission connection has been designed to avoid and minimise serious or irreversible damage to the environment where possible. Further, additional design work (project amendments) carried out since the EIS public exhibition commenced, have been designed, to the greatest extent possible, to avoid and minimise impacts, and to respond to the issues raised by the community and stakeholders. This is demonstrated by the reduction of the disturbance area from approximately 143 hectares to approximately 125 hectares and the reduction of direct impacts to native vegetation from 135.6 to 118.3 hectares (about 13%).

Technical assessments were completed to identify the potential impacts of the project and outline measures to prevent long-term environmental degradation. The EIS and technical assessments, including the revised BDAR and AACHAR, were prepared adopting a conservative approach, which included assessing the worst-case impacts and scenarios.

As outlined in **Section 4.3.1.2**, suitable mitigation measures will be implemented to manage and reduce impacts identified in assessments. The precautionary principle has guided the assessment of environmental impacts and the development of mitigation measures.

Transgrid will continue to consult with NPWS to achieve an offset strategy that will deliver real and long-term conservation outcomes for the KNP. The BOS, which is include in the revised BDAR, has been developed in consultation with BCS, NPWS and DPE.

Transgrid recognises the pristine environment in which the project is located within KNP and is committed to ensuring it enables long-term improvements to the environmental and recreational values.

Inter-generational equity

Social equity is concerned with the distribution of economic, social and environmental costs and benefits. Inter-generational equity introduces a temporal element with a focus on minimising the distribution of costs to future generations. The principle states: “the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations”.

The project may impact on inter-generational equity through the consumption of resources during construction and operation, including fuel and raw materials. The project would result in the consumption of fuels, such as diesel, during construction and operation, the amounts of fuels that would be used are not expected to negatively impact future generations.

The further options assessment and analysis documented in the Options Report (**Appendix D**), considered cost as an evaluation criterion. The project as an overhead transmission connection not only meets all of the evaluation criteria but is also the most cost-effective connection solution.

The project also supports the principle of intergenerational equity by collating scientific and cultural information on former Aboriginal occupation of the area through the previous investigations including the AACHAR (Jacobs, 2021) and the ACHAR (Jacobs 2020). In addition portions of ST PAD 01, ST PAD 02, and Str5 AS would not be harmed by the project and would be preserved in-situ.

Further, the project is required to connect Snowy 2.0 to the NEM to provide reliable and renewable energy. Snowy 2.0 and the project facilitates the increasing generation and connection of renewable energy into the NEM and as such is considered a long term contributor to reduced reliance on low emission energy generation sources and benefitting both current and future generations.

Conservation of biological diversity and ecological integrity

Biodiversity values were considered in the development of the concept design of the project. Conservation of biological diversity and ecological integrity is a fundamental consideration of the project. The design and assessment of the project was carried out with the aim of identifying, avoiding, minimising and mitigating impacts.

Further, additional design work (project amendments) has reduced the disturbance area in the six management zone reducing the amount of vegetation required to be removed.

The amended project would have a direct impact to about 118.3 hectares of native vegetation, which provides important habitat for threatened species. This would include the full cleared of 71.03 hectares of vegetation and the partial clearing 47.24 hectares within disturbance area.

Mitigation and management measures have been recommended to ensure conservation of biodiversity though specific limitations to design and construction, requirements for offsets in accordance with legislation, and implementation of an offset strategy and threatened species monitoring plans.

NPWS and FCNSW have been consulted throughout the development of the project design and will continue to be consulted as the design develops.

Improved valuation, pricing and incentive mechanisms

The principle of internalising environmental costs into decision making requires consideration of all environmental resources which may be affected by the carrying out of a project, including air, water, land and living things.

Environmental factors were considered throughout the development of the design and in planning for construction and operation of the project. As a consequence, environmental impacts were avoided or minimised where practical during the concept design development of the project.

The Amendment Report also provides a final set of mitigation measures, which will be implemented during construction and operation of the project. The cost of these management measures including offsetting payments are incorporated into the project cost, as well as the extent of environmental investigations carried out to inform the EIS.

The project is considered consistent with the principles of ESD.

4.4.2. Costs

Cost is consistently considered in the EIS process as part of the option development and alternative assessment process required under the EP&A Act and listed under the Draft Environmental Impact Assessment Guidance Series, Preparing an Environmental Impact Statement (DPE 2017). It is not an irrelevant consideration.

In addition, the ISP and other Commonwealth and NSW strategic policy documents mention price as an important consideration in the design of the future NEM and actions seek to encourage the development of renewable energy projects that achieve the lowest possible costs and maximum overall benefits to the state economy. This was reflected in one of the evaluation criteria for the further options assessment (under Technical) – in particular, that criteria was for the project to be consistent with the ISP and other Commonwealth and NSW strategic policy documents regarding NEM future needs.

Accordingly, as documented in the Options Report (**Appendix D**), the option development process investigated high level quantification of the estimated costs. This was done as it is critical that the project is designed, constructed and operated in a manner that is practicable and feasible and balances environmental and social impacts with safety impacts, cost and schedule. Importantly, however, while cost was a consideration in the further options assessments and analysis, it was not the only consideration, nor was it the most highly weighted.

The consideration of the key evaluation criteria for each option is summarised in **Figure 3-3**. As shown in the table, underground options would result in increased volumes of excavated material while also requiring vegetation removal, new cleared easements for options that require trenching (Options 9 and 10) and additional infrastructure within KNP (such as infrastructure entry portal and shafts/adits or access points with associated access tracks) that would result in amenity impacts. They would also involve significant cost.

Table 4-9 provides a summary of the construction cost for each of the post screening options. Costs for Option 9 are not included as it is considered not technically feasible and accurate quantification of costing was not possible. As shown in **Table 4-9**, the cost of the underground options (Option 5, Option 6 and Option 8) would be up to five times higher than the base case (Option 4).

The project as an overhead transmission connection (Option 4) not only meets all of the evaluation criteria but is also the most cost-effective connection solution.

Table 4-9 Summary of the construction cost for each of the post screening options

Cost ($)	Option 3	Option 4	Option 5	Option 6	Option 8
Cost	$443,246,000	$290,000,000	$1,392,535,000	$1,086,945,000	$1,303,637,000

4.5. Issues beyond the scope of the project

Some comments were raised in submissions that are considered beyond the scope of the project's application (Snowy 2.0 Transmission Connection Project), they related to:

- HumeLink and other renewable projects, including solar, defies all the principles of ESD
- Government incentivisation of solar panel installation is leading to increased switch gear, circuit breakers, wind turbines & leakage from solar manufacturing, all of which are contributing to huge increases in SF6 which is a greenhouse gas.

4.5.1. Out of scope

4.5.1.1. Other Transgrid Projects/ HumeLink

The HumeLink project is proposed to reinforce the transmission network in southern NSW. HumeLink is a new 500 kV transmission line which will carry electricity to customers from new generation sources, including Snowy 2.0. The project would require new transmission connections between substations at Wagga Wagga, Bannaby and the new substation in Bago Sate Forest proposed under this project. HumeLink is in initial project development phase, with community consultation and study corridor refinement currently underway.

HumeLink was not the subject of the project EIS or application. In accordance with its CSSI declaration, Transgrid would seek a separate EIS application and approval for HumeLink under Part 5, Division 5.2 of the EP&A Act. The HumeLink project was considered in the cumulative impact assessment in the Section 7.13 of the EIS. However, the cumulative impacts of HumeLink were a key factor considered in the further options assessment and analysis (refer to the Options Report provided as **Appendix D**), particularly with the selection of the connection point and keeping as much infrastructure outside of KNP as possible.

Snowy Hydro's energy transition plans respond to identified needs within the NEM and are aligned with global, national, state and local strategic policy as described in Snowy 2.0 Main Works EIS (EMM, 2019).

4.5.1.2. Other out of scope items

Transgrid is supportive in general of renewable energy developments and incentives and considers these to align with the principles of ESD.

The incentivisation of solar/wind/battery, and the regulation of pollution from such activities, is a matter for the government and in particular the Commonwealth Department of Industry, Science, Energy and Resources, Energy NSW and/or the NSW Department of Industry (Division of Resources and Energy).

5. Updated evaluation and conclusion

This section provides the final evaluation of the project. It includes the project justification and conclusion of the environmental impact assessment process. The project justifications as set out in this section have considered the revised BDAR, AACHAR and the Amendment Report.

5.1. Justification of the project

The project has been declared CSSI and is essential to connect Snowy 2.0 to the NEM. The project would also provide a connection point into the future southern network reinforcement project (HumeLink) which, when completed, would strengthen the southern network. This includes reducing constraints on Line 64 and would allow the export of the full capacity of Snowy 2.0 across the broader transmission system. The benefits of connecting Snowy 2.0 to the NEM, are considered to outweigh any identified adverse impacts of the project. While some environmental impacts cannot be avoided, they would be minimised where possible through the implementation of mitigation measures and offsetting.

The project has undergone a comprehensive environmental impact assessment in accordance with the legislation and guidance, resulting in an adequate EIS. The approvals process has included the public exhibition of the EIS and, as a result, the preparation of an Amendment Report and this Submissions Report.

This assessment process has demonstrated the justification of the project, while considering the following:

- Biophysical considerations: The project, as an overhead transmission connection has been designed to avoid and minimise serious or irreversible damage to the environment where possible. The project design has sought opportunities to avoid and minimise impacts where possible. Within the process, Transgrid has continuously sought to reasonably avoid and minimise impacts, particularly within KNP. Additional design work (project amendments) post EIS public exhibition has reduced the disturbance area from approximately 143 hectares to approximately 125 hectares
  The amended project would result in direct impacts to about 118.3 hectares of native vegetation which is a reduction of about 17.3 hectares (13%) from the project as assessed in the EIS. The project would introduce permanent infrastructure into KNP and Bago State Forest and would change the existing natural landscape and its setting, affecting biodiversity and potentially heritage values. To offset the biodiversity impacts, a BOS has been prepared to deliver actions which provide for long-term improvements and conservation outcomes for KNP and Bago State Forest. As part of the BOS, management actions to offset impacts within KNP would be designed in consultation with the relevant stakeholders. In relation to possible impacts on the existing heritage values of the Australian Alps National Parks and Reserves, these will be modest at most and are considered acceptable, given the project's relatively small disturbance area within the larger curtilage of this item and the proposed offset and mitigation measures that are to be implemented
- Social considerations: Most social impacts are localised and would be temporary during construction. These impacts include amenity (noise, dust and access), temporary changes to the boating access on Talbingo Reservoir. The long term impacts relate to community values relating to scenic and landscape amenity as a result of vegetation clearing and the introduction of new infrastructure into KNP and Bargo State Forest. The project is expected to have a cumulative impact with Snowy 2.0 during construction on biodiversity, traffic and amenity (visual, noise and dust), water quality and bushfire risk. However, the majority of these impacts would be temporary and localised to the Lobs Hole Ravine area and would be unlikely to contribute to impacts in the broader region

- Economic considerations: Economic benefits are anticipated for local businesses during construction due to increased demand for goods and services. Although impacts on accommodation availability for tourists and visitors during peak tourist periods and increased pressure on community services and facilities with an influx of construction workforce would also be likely during construction. During operation, the project would connect Snowy 2.0 to the transmission network, allowing Snowy 2.0 to operate within the NEM and provide reliable, dispatchable electricity. Therefore, the project supports the planned transition to a low carbon energy future. The further options assessment and analysis considered cost as one of a suite of evaluation criteria. The project, as overhead transmission lines, not only meets all of the evaluation criteria but is also the most cost-effective connection solution
- Public interest: The long-term benefits of the project, when taken together with Snowy 2.0 Main Works project, are considered to be in the public interest. Snowy 2.0 is the largest committed renewable generation project in Australia. It would provide an additional 2,000 megawatts (MW) of dispatchable generating capacity and make approximately 350,000 MWh of large scale storage available to the NEM at any one time

  Currently, most energy used in NSW comes from non-renewable sources. These power sources contribute to greenhouse gas emissions, as well as local and regional air pollution. The project would connect Snowy 2.0, provide much needed energy to the growing NSW population as well as reducing reliance on non-renewable energy, potentially decreasing greenhouse gas emissions and air pollution over time
- Preferred and optimal solution: The project as an overhead connection to Line 64 is the optimal solution based on the further options assessment and analysis documented in the Options Report (**Appendix D**). The evaluation criteria for the options assessment and analysis included the consideration of environmental impacts, the cumulative infrastructure need for HumeLink and keeping as much infrastructure as possible outside of KNP. The Options Report clearly demonstrates that the overhead transmission connection to the new substation, is the preferred option as it is the optimal solution which balances technical feasibility, cost and environmental impacts.

5.2. Concluding statement

This Submissions Report documents and considers and addressed where appropriate the issues raised by the community, government agencies and organisations, during public exhibition of the EIS, in accordance with section 5.17(6)(a) of the EP&A Act.

The project, including the proposed amendments identified in the Amendment Report, has been designed, to the greatest extent possible, to avoid and minimise impacts, and to respond to the issues raised by the community and stakeholders. If the project is approved, the detailed design and construction methodology for the amended project would be further developed with the objective of further avoiding and minimising potential impacts on the local and regional environment, and the local community.

The merits of the project including the benefits of connecting Snowy 2.0 to the NEM are considered to outweigh any identified adverse impacts of this project. While some environmental impacts cannot be avoided, they have and would be minimised to the extent practicable through the implementation of mitigation measures and where residual impacts remain, they will be offset, refer to Appendix B of Amendment Report. This, it is submitted, is an appropriate response enabling the project to be approved.

6. References

EMM, 2019. *Environmental Impact Statement: Snowy 2.0 Main Works EIS*. Prepared for Snowy Hydro Limited

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Fairfull and Witheridge, 2003. *Why do fish need to cross the road? Fish passage requirements for waterway crossings*

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State Forests of NSW, 2000). *Forest Soil and Water Protection – A Guide for Operators*

Transgrid, 2021. *Snowy 2.0 Connection Project Environmental Impact Assessment*

Transgrid, 2021a. *Snowy 2.0 Connection Project Amendment Report*

SLR, 2019. Snowy 2.0 *Main Works -Rehabilitation Strategy*

Appendix A Submissions summary

ID	Issue category	Key Issues	Sub-issues
Government agencies			
Crown Land	Project impacts	Land	Other
Heritage Council	Project impacts	Non-Aboriginal heritage	Project impacts
	Project impacts	Non-Aboriginal heritage	Mitigation
DPE – Water Group	The project	Project elements	Ancillary infrastructure
	The project	Construction method	Activities
	Project impacts	Biodiversity	Project impacts
MEG	Project impacts	Land	Other
HNSW	Project impacts	Aboriginal heritage	Mitigation
EPA	The project	Project elements	Substation
	The project	Construction method	Resources
	The project	Construction method	Activities
	Project impacts	Water quality	Mitigation
FCNSW	The project	Project elements	Rehabilitation
	The project	Project elements	Ongoing maintenance
	The project	Construction method	Activities
	Project impacts	Biodiversity	Mitigation
	Project impacts	Land	Other
	Project impacts	Transport	Project impacts
	Project impacts	Hazards/ safety	Other
TfNSW	Project impacts	Transport	Mitigation
NPWS/BCS	The project	Alternatives and options	Alternatives
	The project	Project elements	Ongoing maintenance
	The project	Project elements	Rehabilitation
	The project	Project elements	Ancillary infrastructure
	The project	Construction method	Activities
	Project impacts	Biodiversity	Project impacts
	Project impacts	Biodiversity	Mitigation
	Project impacts	Water	Mitigation
	Project impacts	Flooding	Mitigation
	Project impacts	Transport	Project impacts
	Project impacts	Transport	Mitigation
	Project impacts	Non-Aboriginal heritage	Project impacts
	Project impacts	Aboriginal heritage	Project impacts

ID	Issue category	Key Issues	Sub-issues
	Project impacts	Hazards/ safety	Other
	Procedural matters	Assessment and approval	Adequacy of the technical assessments
	Procedural matters	Assessment and approval	Consultation/engagement
Organisations			
Bushwalking NSW	The project	Alternatives and options	Alternatives
Canberra Bushwalking Club	The project	Alternatives and options	Alternatives
Dubbo Environment Group	The project	Alternatives and options	Alternatives
Greg Piper MP	The project	Alternatives and options	Alternatives
NPA	The project	Alternatives and options	Route options
	The project	Alternatives and options	Alternatives
	Procedural matters	Assessment and approval	Adequacy of the EIS
	Project impacts	Landscape and visual	Project impacts
	Project evaluation	Project justification	Public interest
	Project evaluation	Project justification	ESD
	Project evaluation	Cost and funding	Costs
NCC	Procedural matters	Assessment and approval	Adequacy of the EIS
	The project	Alternatives and options	Alternatives
Community members – individual			
PS1	Procedural matters	Assessment and approval	The assessment process
	The project	Alternatives and options	Alternatives
PS2	The project	Alternatives and options	Alternatives
	Procedural matters	Assessment and approval	Adequacy of the EIS
PS3	The project	Alternatives and options	Alternatives
PS4	The project	Alternatives and options	Alternatives
PS5	The project	Alternatives and options	Alternatives
	The project	Alternatives and options	Options assessment process
PS6	The project	Alternatives and options	Alternatives

ID	Issue category	Key Issues	Sub-issues
PS7	The project	Alternatives and options	Alternatives
PS8	The project	Alternatives and options	Alternatives
PS9	The project	Alternatives and options	Alternatives
PS10	The project	Alternatives and options	Alternatives
PS11	The project	Alternatives and options	Alternatives
	Project impacts	Landscape and visual	Project impacts
PS12	The project	Alternatives and options	Alternatives
PS13	Project impacts	Biodiversity	Project impacts
	Project impacts	Transport	Other
	Procedural matters	Assessment and approval	Consultation/engagement
PS14	The project	Alternatives and options	Alternatives
PS15	The project	Alternatives and options	Alternatives
	The project	Project elements	Ancillary infrastructure
	Procedural matters	Assessment and approval	Issues after project approval
PS16	The project	Alternatives and options	Alternatives
	The project	Alternatives and options	Options assessment process
	Procedural matters	Assessment and approval	Adequacy of the EIS
PS17	The project	Alternatives and options	Alternatives
PS18	The project	Alternatives and options	Alternatives
PS19	Procedural matters	Assessment and approval	Consultation/engagement
PS20	Procedural matters	Assessment and approval	Adequacy of the EIS
PS21	The project	Alternatives and options	Alternatives
PS22	The project	Alternatives and options	Alternatives
PS23	Project evaluation	Project justification	Public interest
PS24	Issues beyond the scope of the project	Out of scope	Other Transgrid projects/HumeLink

Appendix B Register of submitters

Submitter	ID	Name	Section where issues are addressed
Government agencies	-	Crown Lands	**Section 4.3.6**
	-	Heritage Council	**Section 4.3.3**
	-	DPE - Water Group	**Section 4.1.2, Section 4.1.3**, **Section 4.3.4**, and Amendment Report
	-	MEG	**Section 4.3.6**
	-	HNSW	**Section 4.3.2**, Amendment Report and AACHAR
	-	EPA	**Section 4.1.2**, **Section 4.1.3**, **Section 4.3.4**, and Amendment report
	-	FCNSW	**Section 4.1.2**, **Section 4.1.3**, **Section 4.3.1**, **Section 4.3.6**, **Section 4.3.7** and **Section 4.3.9**
	-	TfNSW	**Section 4.3.7**
	-	NPWS/BCS	**Section 3.2**, **Section 4.1.1**, **Section 4.2.1**, **Section 4.3.1** to **Section 4.3.5**, **Section 4.3.7**, **Section 4.3.8**, **Section 4.3.9**, revised BDAR and the Amendment Report
	-	DPI - Fisheries	No comments
Organisations	-	Bushwalking NSW	**Section 3.2** and **Section 4.1.1**
	-	Canberra Bushwalking Club	**Section 3.2** and **Section 4.1.1**
	-	Dubbo Environment Group	**Section 3.2** and **Section 4.1.1**
	-	Greg Piper MP	**Section 3.2** and **Section 4.1.1**
		NCC	**Section 3.2** and **Section 4.1.1** and **Section 4.2.1**
		NPA	**Section 3.2**, **Section 4.1.1**, **Section 4.2.1**, **Section 4.3.1**, **Section 4.3.8** and **Section 0**
Community members – individual	PS1	Peter Anderson	**Section 3.2**, **Section 4.1.1** and **Section 4.2.1.2**
	PS2	Sharnie Connell	**Section 3.2** and **Section 4.1.1** and **Section 4.2.1.2**
	PS3	Tim Carroll	**Section 3.2** and **Section 4.1.1**
	PS4	Anonymous	**Section 3.2** and **Section 4.1.1**
	PS5	Justin Field	**Section 3.2**, **Section 4.1.1** and **Section 4.2.1**
	PS6	Carol Jordan	**Section 3.2** and **Section 4.1.1**
	PS7	Dr Helen Stevens	**Section 3.2** and **Section 4.1.1**
	PS8	Judy Kelly	**Section 3.2** and **Section 4.1.1**
	PS9	Susan Ambler	**Section 3.2** and **Section 4.1.1**
	PS10	Sonja Weinberg	**Section 3.2** and **Section 4.1.1**
	PS11	John Sim	**Section 3.2**, **Section 4.1.1** and **Section 4.3.8**
	PS12	Jessica Scott	**Section 3.2** and **Section 4.1.1**

Submitter	ID	Name	Section where issues are addressed
	PS13	Name Withheld	**Section 4.3.1**, **Section 4.3.7.1** and **Section 4.2.1.6**
	PS14	Claire Coulson	**Section 3.2** and **Section 4.1.1**
	PS15	Bernard Griffin	**Section 3.2**, **Section 4.1.1**, **Section 4.2.1.5** and **Section 4.1.2.2**
	PS16	Ted Woodley	**Section 3.2**, **Section 4.1.1** and **Section 4.2.1**
	PS17	Anonymous	**Section 3.2** and **Section 4.1.1**
	PS18	Anne Reeves	**Section 3.2** and **Section 4.1.1**
	PS19	Anonymous	**Section 4.2.1.6**
	PS20	Judy Lambert	**Section 4.2.1.2**
	PS21	Name Withheld	**Section 3.2** and **Section 4.1.1**
	PS22	Albert Martin	**Section 3.2** and **Section 4.1.1**
	PS23	Anonymous	**Section 4.4.1**
	PS24	Anonymous	**Section 4.5**

Appendix C Government agencies and organisations submissions

Each government agencies and organisation submission was reviewed, and the issues raised in each were summarised broadly according to the order and headings provided in each submission (where such headings were provided). In some instances, related issues have been grouped under a single heading.

C.1 Crown Lands

Table C-1 outlines the matters raised by Crown Lands and Transgrid's responses.

Table C-6-1 Matters raised by Crown Lands

Matters raised	Response
There is a Crown Public Road that may be affected by the proposal. Should the Crown Public Road be required, either during the construction phase, or in an ongoing capacity, the Crown Public Road is to be transferred to Council, or the proponent is to make application to close and purchase the Crown Road. If applicant needs to make application to close and purchase the road, a licence agreement must be in place before works begin.	No Crown Land roads are expected to be impacted by the project, refer to **Section 4.3.6**.

C.2 Heritage NSW – Heritage Council of NSW (Heritage Council)

Table C-2 outlines the matters raised by the Heritage Council and Transgrid's responses.

Table C-6-2 Matters raised by Heritage NSW – Heritage Council of NSW

Matters raised	Response
It is unclear why Transgrid proposes to excavate areas with no archaeological significance.	Clarification regarding the proposed excavations is provided in **Section 4.3.3**.
A clear assessment of potential significance, including the contribution of the areas of archaeological potential to the wider Snowy Hydro scheme is required. If the assessment of significance identifies that areas of archaeological significance will be impacted options to avoid these areas should be considered. If avoidance is not possible a research design and excavation method should be produced.	Further details regarding significance, impacts and measures are provided in **Section 4.3.3.1**.

Matters raised	Response
The following archaeological conditions are recommended for the project: • A suitably qualified and experienced historical archaeologist to manage the historical archaeological program • An Archaeological Research Design and Excavation Methodology shall be prepared to guide the archaeological program.	These conditions are appropriate for the project, and should historical archaeological excavations be required, these would be carried out in accordance with these conditions if they are stipulated, refer to **Section 4.3.3.1**. The mitigation measures have been updated to reflect this, refer to Appendix B of the Amendment Report.
As the project area contains local heritage items, and other local items are in the vicinity, advice should be sought from the relevant local council.	These five items have been addressed as archaeological sites/features as per *Heritage Act 1977*. Therefore, the items are not of local heritage significance and no consultation with local councils is warranted or has been carried out, refer to **Section 4.3.3.1**.

C.3 DPE – Water Group

Table C-3 outlines the matters raised by DPE – Water Group and Transgrid's responses.

Table C-6-3 Matters raised by DPI – Water

Matters raised	Response
Water	
Confirmation is required that Snowy 2.0 and the local water supplies have the ability to supply the quantity of water require for construction.	Refer to **Section 4.1.3.2** for details on where the construction water would be sourced from.
A SWMP which should include an ESCP is required to be prepared to manage potential impacts to watercourses.	A SWMP which will include an ESCP will be prepared, refer to **Section 4.1.3.1**.
If the groundwater take exceeds 3 ML, Transgrid will need to obtain sufficient entitlement in the groundwater source to account for the water take.	Refer to Section 4.1.31. In the unlikely case that the amount of water extracted be more than 3 ML/year, a water access licence would be obtained.
Stream crossing design should include standard measures to protect water quality and stream function.	Noted. Further details are provided in **Section 4.1.2.2**.
The proponent should undertake suitable studies of proposed positions of transmission structures and vehicular access to avoid, manage and mitigate impact to alpine ferns or other PCTs or GDEs along the proposed alignment.	The revised BDAR is provided in Appendix C of the Amendment Report. The revised BDAR considered the impacts of the project on alpine ferns, PCTs and GDEs.

C.4 Regional NSW – Mining, Exploration & Geoscience (MEG)

Table C-4 outlines the matters raised by MEG and Transgrid's responses.

Table C-6-4 Matters raised by Regional NSW - Mining, Exploration & Geoscience

Matters raised	Response
A new Exploration Licence (EL 9056) held by Bullseye Gold Pty Ltd overlies the proposed substation and western portion of the project area. As such Transgrid should contact Bullseye Gold Pty Ltd to determine their levels of interest.	Transgrid has contacted Bullseye Gold Pty Ltd, refer to **Section 4.3.6**. Bullseye Gold Pty Ltd have a low interest in the project area and has no objection to the project.

C.5 Heritage NSW – Aboriginal cultural heritage (HNSW)

Table C-5 outlines the matters raised by HNSW and Transgrid's responses.

Table C-6-5 Matters raised by HNSW

Matters raised	Response
Some of the project area remains unsurveyed and untested.	The full disturbance area has now been surveyed and test excavations have been completed. Refer to **Section 4.3.2** and the AACHAR attached as Appendix D to the Amendment Report.
As test excavations have not been completed for all PAD within the project area, the full impacts to Aboriginal cultural heritage values remain unknown. As the ACHAR outlines that the significance of the untested PADs cannot be comprehensively assessed prior to archaeological test excavation, HNSW recommend DPE consider whether enough information is available to inform impacts to Aboriginal cultural heritage values. Alternatively, upfront test excavations would inform the significance of the PADs, whether future salvage excavation is required and would allow the proponent to redesign the project to avoid any significant objects or sites if necessary.	
The preparation of a CHMP, post approval, should not take the role of adequate assessment during the EIS process.	A CHMP would be developed to provide guidance on the procedure for the identification of unexpected Aboriginal objects and the long-term management of Aboriginal objects retrieved.

C.6 NSW Environment Protection Authority (EPA)

The EPA submission notes that the project is partly located within the KNP. The EPA reminds the Proponent that the important and sensitive environmental values of KNP require a high level of protection from construction activities associated with the project. As such the EPA has provided the following comments and recommendations as summarised in **Table C-6**.

Table C-6-6 Matters raised by the EPA

Matters raised	Response
Water	
Appropriate Level of Ecosystem Protection: The EPA considers that the EIS does not currently adopt an appropriate level of ecosystem protection for the project. In that regard, The EPA recommends that Transgrid adopt an appropriate level of protection for waterways in conducting the water quality assessment that will inform the development of appropriate management and mitigation measures.	A surface water quality monitoring strategy has been prepared as part of the Amendment Report, refer to **Section 4.3.4**. The ecosystem protection limit adopted for the surface water quality monitoring program is 95% species protection limit for waterways that flow through the Bago State Forest, within and in proximity to project area west and 99% species protection limit for all other waterways near the project area within KNP. The surface water quality monitoring strategy would form the basis of the surface water quality monitoring program (see below).
Baseline Water Quality Data: The EIS relies on the existing water quality data from the Snowy 2.0 for the eastern extent of the project. There is no existing water quality presented in the EIS for the western extent and as such states that that given surrounding land-use; it is expected that waterways in the western extent would exhibit similar water quality to waterways within the eastern extent of the project. The EPA considers this is unlikely due to different land uses and surface geology and that groundwater is likely to contribute to surface water baseflow in some waterways. In addition, the water quality data for the Snowy 2.0 EIS was collected during a drought period between February 2018 and March 2019 and prior to the bushfires in 2020. As such the data may not be contemporary for the project. In order to appropriately characterise baseline water quality within receiving waterways impacted by the project, the EPA recommends that Transgrid prepare a surface water quality monitoring program.	The surface water quality monitoring program would be implemented to gain an appreciation of background water quality, to observe any changes in surface water quality that may be attributable to the project and inform appropriate management responses, refer to **Section 4.3.4**. The surface water quality monitoring strategy is provided in Appendix E of the Amendment Report.
Water Management at Substation: The EPA considers that the management of water generated within the substation is unclear.	An oil containment and stormwater management systems would be installed as part of the substation development and the on-site stormwater drainage system would allow stormwater flows from the site to be diverted appropriately away from the switchyard. Further details of the water management at the substation (including spill containment) are provided in Section 3.3.1 of the Amendment Report.
Dewatering: If a discharge to waters is required as part of any dewatering activities, the Proponent must complete an assessment to identify whether management and mitigation measures are required to achieve the WQOs	The surface water quality monitoring program will include WQOs and management and mitigation measures as required should dewatering be required, refer to **Section 4.3.4**. The water quality monitoring strategy is provided in Appendix E of the Amendment Report.

Matters raised	Response
Sediment and erosion control	
The approach to sediment and erosion control is unclear.	Erosion and sedimentation will be managed through implementation of effective sediment control measures as outlined in the SWMP which will be prepared and implemented prior to and during construction. Transgrid has been working closely with the EPA in developing and designing key sediment control measures to prevent any change to the existing baseline surface water quality within and adjoining the project area. Further details of regarding sediment and erosion control are provided in Section 4.1.3.1 and Section 3.3.4.2 of the Amendment Report.
Spoil Management	
Further details are required on the spoil management as the EIS does not: • Explore other alternatives to emplacement • Explore all reasonable and practical measures to avoid subaqueous emplacement (e.g. reuse of material on access tracks throughout the local road network) • Demonstrate if the spoil will be suitable for subaqueous disposal, or the expected quantity of material to be disposed of via subaqueous emplacement • Assess water quality impacts associated with subaqueous emplacement of project material, noting geology, extraction method and particle size may differ from those approved for Snowy 2.0 • Describe how the material will be managed (e.g. stored in temporary stockpiles) and what controls will be used to minimise and mitigate potential impacts to waters.	A spoil management strategy will be prepared for the project. The strategy will outline appropriate management procedures for the generation, management and importation (if required) of spoil. During the design development alternative arrangements have been considered for excess spoil disposal included trucking the excess material off site. This would have substantial traffic impacts on the local road and would conflict with Snowy 2.0 heavy vehicle movement within Lobs Hole /Ravine area. As such emplacement was selected as the preferred method of spoil disposal. No subaqueous disposal of spoil would occur as part of the project. As such spoil would be transported by truck from the work locations via Lobs Hole to spoil emplacement locations approved as part of Snowy 2.0, such as Ravine Bay, GF01 and Main Yard emplacement areas (or any other approved areas) with the locations shown in **Figure 3-4**. Prior to transporting the excess spoil material, it would be classified to ensure it's consistent with the conditions approved for the Snowy 2.0 project and suitable for disposal at the emplacement areas. The estimated excess spoil for the amended project has been reduced to from about 364,800m^3 to about 180,000m^3 this represents about a 49% reduction, Refer to Appendix A of the Amendment Report. Further details of regarding spoil management are provided in Section 4.1.3.1 and Appendix A of the Amendment Report.

Matters raised	Response
The EPA reiterates that the Spoil Management Plan for the Ravine Bay emplacement area in the Snowy 2.0 project has not been approved and accordingly, the environmental controls required for the Ravine Bay emplacement area have not been developed. The EPA reiterates that a comprehensive emplacement management plan is required prior to undertaking any emplacement in Ravine Bay and that the necessary approvals have been provided to facilitate emplacement in Ravine Bay prior to transporting this material.	No material would be transported and disposed of at the emplacement areas until Snowy Hydro has prepared relevant management plan(s) for emplacement and the necessary approvals have been granted to facilitate emplacement.

C.7 Forestry Corporation of NSW (FCNSW)

Forestry and timber processing are identified as economic drivers for the LGA, and key contributors to the region's economy. The loss of potential long term forestry uses is recognised as an impact of the project. As such FCNSW has provided the following comments and recommendations as summarised in **Table C-7.**

Table C-6-7 Matters raised by FCNSW

Matters raised	Response
Compensation	
Any economic loss needs to be addressed as part of the land acquisition process. The compensation value needs to include: • Land Value and Replacement Land • Timber value • Establishment of Replacement Forest.	The final compensation package would be determined in agreeance with FCNSW, refer to **Section 4.3.6**.
Fire management	
FCNSW must retain all current road access from the Elliott Way to Bago and Maragle State Forests for forest and fire management purposes.	There may be possible disruptions to FCNSW activities around the project area, refer to **Section 4.3.7.1**. FCNSW would be notified, of any potential disruptions prior to the works starting and the disruptions would be managed in accordance with the CTMP.
Bushfire protection measures need to occur annually, agreed by FCNSW, then funded and implemented by Transgrid. This includes ongoing management of 'hazard trees' on a risk basis, at Transgrid's cost.	Further details ongoing maintenance and management of hazard trees are provided in Section 3.3.4 of the Amendment Report.
The cease-work recommendations during days of elevated fire danger don't align with the successful long-term established practices for State forests in NSW, including Batlow, Tumut and Tumbarumba. Preventative fire mitigation practices within FCNSW's Forest Practices Codes should be applied to the construction and maintenance works of the project.	Mitigation measures have been updated to remove the cease work recommendation and add that fire mitigation practices within FCNSW's Forest Practices Codes would be applied. Refer to Appendix B of the Amendment Report.

Matters raised	Response
Ecology and biosecurity	
Monitoring programs should be designed in collaboration with FCNSW so that existing programs are complimentary and integrated. FCNSW would specifically seek to collaborate with Transgrid on surveys for Yellow-bellied Glider, Squirrel Glider, and the Greater Glider as part of the glider monitoring program.	Refer to **Section 4.3.1**. The details of the monitoring program will be determined during the preparation of the BMP and would be designed in collaboration with FCNSW and NPWS.
All construction equipment must be washed and sterilised of soil, rock and vegetative material as a biosecurity practice before arriving on the State forest.	Recommendation adopted. Refer to **Section 4.3.1**.
Transport management	
The area around the substation construction site is used infrequently by the forest industry. However, the main roads around Tumbarumba, Batlow, Rosewood, Adelong and Tumut are well used by both light and heavy-combination vehicles. Transport through Batlow by multi-combination log and freight transport can be avoided through the use of sealed roads owned by FCNSW. The alternative can be arranged with Transgrid under Permit (or development conditions) with FCNSW. Fees are payable for use of these roads.	There may be possible disruptions to FCNSW activities around the project area, refer to **Section 4.3.7.1**. FCNSW would be notified, of any potential disruptions prior to the works starting and the disruptions would be managed in accordance with the CTMP. Alternative routes around Batlow would be investigated.
The proposed Traffic Management Plan should cover construction and ongoing maintenance of the substation and transmission infrastructure, preferably in combination with the HumeLink Project.	The CTMP will be prepared prior to the project commencing in mid-2022. HumeLink is not expected to start construction until 2024. As such the TMP will be project specific, but it would be updated in future as and when appropriate.
Construction, clearing and earthworks	
The documentation states that vegetation clearing would include the use of chainsaws and tree pushers. The use of tree pushers tends to create large areas of soil disturbance, especially root balls. A tree harvester is a more cost-effective, safer and environmentally appropriate machine to use to clear standing timber. FCNSW has not commenced discussions with Transgrid about disposal of rock, soil or mulched vegetative material on State forest. Spoil management and NOA needs to involve a methodology, operational practice and audit procedure agreed with FCNSW. Agreement must be reached between the parties for long-term storage on state forest. An alternative disposal area should be considered in the first instance.	A tree harvester would be the primary method of vegetation clearing where the full root system does not need to be removed. However, tree pushers would be used in areas where civil works would be carried out as civil works would require the complete removal of the root systems. Further details on construction methodology and spoil management are provided in **Section 4.1.3** and Appendix A of the Amendment Report.

C.8 Transport for NSW (TfNSW)

Table C-8 outlines the matters raised by TfNSW and Transgrid's responses.

Table C-6-8 Matters raised by TfNSW

Matters raised	Response
TfNSW does not believe the development will have a significant impact on the state classified road network or any operational and non-operational rail corridors.	Noted
The development is to comply with requirements in the submitted Snowy 2.0 Transmission Connection Project Traffic and Transport Impact Assessment, Rev 6, December 2020 prepared by Jacobs.	Noted
Fatigue and weather condition management plan for both light and heavy vehicles that details driver protocols for both driver fatigue and adverse weather conditions shall be prepared before the commencement of the project as well as implemented, and reviewed as required, for the duration of the project	A fatigue and weather condition management plan will be prepared as part of the CTMP, refer to **Section 4.3.7**.

C.9 National Parks and Wildlife Service (NPWS) and Biodiversity, Conservation & Science (BCS)

NPWS/BCS have concerns regarding the assessment and treatment of impacts of the project on the visual amenity, biodiversity and recreational values of a largely pristine landscape within KNP. In particular, they consider the analysis of the powerline options to be inadequate and that more work needs to be done by Transgrid to show the relative viability of their preferred option, and to identify the comparative environmental impacts of alternate options. The main issues that require clarification and resolution are summarised in **Table C-9.**

In addition, NPWS/BCS have suggested a number of CoA as part of their submission. NPWS/BCS have also requested that the CoA are prepared in consultation with them to ensure that issues identified in this submission are adequately addressed. Should the project be approved, the CoA would guide subsequent phases of the project. Post approval design, as well as the construction and operation, would be carried out in accordance with the CoA.

Table C-6-9 Issues raised by NPWS/BCS

Issue description	Response
Impact to largely pristine area of national park: If the overhead transmission option remains the preferred option, NPWS will discuss all options to reduce impacts, and compensate for any remaining unavoidable impacts (e.g. visual amenity) in addition to biodiversity impacts.	Noted. As described in **Section 4.3.1.2**, where impacts are unavoidable, they would be offset in accordance with the BOS to achieve long-term conservation outcomes in the park, in line with the values and mitigation strategies outlines in the KNP PoM and as determined in consultation with NPWS.

Issue description	Response
Options analysis: Gaps in the options analysis including comparison of all relevant parameters such as, clearing and construction disturbances, residual disturbance area, spoil volumes, visual amenity impacts and costs. The analysis should include all alternative options identified in the EIS and potentially those proposed during public submissions, with the aim of identifying those with the least environmental impact and cost effectiveness.	Since the exhibition of the EIS, further options assessment and analysis has been carried out for several different connection alternatives (including the options in the EIS) as documented in the Options Report. The Options Report determined that the underground transmission options considered were not technically viable or they did not meet the evaluation criteria, refer to **Section 3.2** and **Appendix D**.
Non-compliance with the BAM: The BDAR is incomplete and requires more work before project determination to meet the requirements of the BAM. Potential impacts to some threatened species, particularly Booroolong frog, are not adequately considered. Insufficient detail has been provided about measures to mitigate, monitor and manage potential impacts to have confidence that the calculated credit requirement will sufficiently offset residual impacts of the development.	A revised BDAR has been prepared in response to this submission and to assess the amended project. The revised BDAR is provided as Appendix C of Amendment Report and any additional findings are also summarised in Chapter 6 of the Amendment Report.
Biodiversity Offset Strategy - more detail and further analysis about how credits will be determined and how the credit obligation can be met within and outside KNP is required, in consultation with and to the satisfaction of NPWS and BCS.	As outlined in **Section 4.2.1.2**, the BOS has now been prepared and includes detail and further analysis about how credits will be determined and how the credit obligation can be met within and outside KNP. The BOS is provided as Appendix L of the revised BDAR (Appendix C of the Amendment Report).
Potential post construction liability - if the project is approved the potential liability for NPWS in three post construction circumstances needs to be addressed: (i) rehabilitation does not meet completion criteria in agreed timeframe or is incapable of meeting the completion criteria; (ii) long term stability or contamination; and (iii) increased biosecurity risks (weeds, pests and pathogens) associated with new access tracks and easements in largely pristine areas of KNP.	As stated in **Section 4.2.1.4**, all post construction and rehabilitation requirements would rest with Transgrid. NPWS would be consulted as part of the preparation of the rehabilitation plan to ensure that it provides the appropriate framework and performance targets as agreed to with NPWS. The rehabilitation and the management of biosecurity risk are discussed in **Section 4.3.1** and **Section 4.3.1.1** respectively.
Further details are provided on project traffic using Elliott Way, vegetation clearing, rehabilitation and soil management.	**Section 4.1.3** provided further details on the construction methods including vegetation clearing, rehabilitation and soil management. **Section 4.3.7** details the project traffic using Elliott Way, safety concerns and the works above Elliott Way. The Amendment Report also further details and clarifications on these project aspects.
NPWS disagree with some of the statements and assumptions in the LCVIA.	**Section 4.3.8.1** provided further details and clarifications on the LCVIA.

Issue description	Response
The qualitative flood risk assessment requires more work to meet BCS requirements for flooding assessment. Further assessment must be carried out during the detailed design phase, prior to any development, and to the satisfaction of the Secretary	As outlined in **Section 4.3.5**, the EIS commits to undertake the further suggested flood modelling.
A number of recommendations of CoA were suggested. NPWS and BCS have requested that the CoA are prepared in consultation with them.	Transgrid acknowledges the CoA recommendations.

C.10 Bushwalking NSW

Table C-10 outlines the matters raised by Bushwalking NSW and Transgrid's responses.

Table C-6-10 Matters raised by Bushwalking

Matters raised	Response
Transmission lines should not be built within the KNP at all. However, if they are to proceed then they should be underground lines.	EIS has provided an argument justifying an overhead connection and an exemption/ amendment from the KNP PoM. Since the exhibition of the EIS, further options assessment and analysis has been carried out for several different connection alternatives. The further analysis of connection options found that the underground transmission options considered were not technically viable or they did not meet the evaluation criteria, refer **Section 3.2** and **Appendix D**.

C.11 Canberra Bushwalking Club

Table C-11 outlines the matters raised by the Canberra Bushwalking Club and Transgrid's responses.

Table C-6-11 Matters raised by Canberra bushwalking club

Matters raised	Response
The transmission lines should be located underground	EIS has provided an argument justifying an overhead connection and an exemption/ amendment from the KNP PoM. Since the exhibition of the EIS, further options assessment and analysis has been carried out for several different connection alternatives. The further analysis of connection options found that the underground transmission options considered were not technically viable or they did not meet the evaluation criteria, refer to **Section 3.2** and **Appendix D**.

C.12 Dubbo Environment Group

Table C-12 outlines the matters raised by the Dubbo Environment Group and Transgrid's.

Table C-6-12 Matters raised by Dubbo Environment Group

Matters raised	Response
The transmission lines should be located underground	EIS has provided an argument justifying an overhead connection and an exemption/ amendment from the KNP PoM. Since the exhibition of the EIS, further options assessment and analysis has been carried out for several different connection alternatives. The further analysis of connection options found that the underground transmission options considered were not technically viable or they did not meet the evaluation criteria, refer to **Section 3.2** and **Appendix D**.

C.13 Greg Piper MP

Table C-13 outlines the matters raised by the Greg Piper MP and Transgrid's responses and/ or a reference to the section that responses to the issue.

Table C-6-13 Matters raised by Greg Piper MP

Matters raised	Response
The transmission line should be located underground to avoid having a substantial visual and environmental impact on one of the State's best and most important national parks.	EIS has provided an argument justifying an overhead connection and an exemption/ amendment from the KNP PoM. Since the exhibition of the EIS, further options assessment and analysis has been carried out for several different connection alternatives. The further analysis of connection options found that the underground transmission options considered were not technically viable or they did not meet the evaluation criteria, refer to **Section 3.2** and **Appendix D**. To help reduced the visual impacts of the project, the new structures would undergo accelerated ageing of the zinc galvanised coatings prior to erection, refer to **Section 4.3.8.2**.

C.14 National Parks Association of NSW (NPA)

NPA are concerned that Transgrid have submitted an EIS for the construction of overhead transmission lines through a KNP and that the KNP PoM requires that any new connections be constructed underground. The main issues and concerns raised by NPA are summarised in **Table C-14**.

Table C-6-14 Issues raised by NPA

Issue description	Response
Kosciuszko National Park Plan of Management (KNP PoM)	
The proposal for overhead transmission is inconsistent with the KNP PoM, which includes a legally binding requirement for "all additional telecommunication and transmission lines to be located underground" and thereby precludes approval of the project.	EIS has provided an argument justifying an overhead connection and an exemption/ amendment from the KNP PoM. Since the exhibition of the EIS, further options assessment and analysis has been carried out for several different connection alternatives. The further analysis of connection options found that the underground transmission options considered were not technically viable or they did not meet the evaluation criteria, refer to **Section 3.2** and **Appendix D**.

Issue description	Response
The proposed amendment to the KNP PoM to lift the prohibition on new overhead transmission lines is inappropriate and does not meet the requirements of Section 72AA of the NPW Act. It should therefore not be approved.	**Section 4.2.1** discusses the KNP PoM. The amendment is required to ensure that the issuing of tenure under the NPW Act for Snowy 2.0 construction and operations authorised under the EP&A Act can be carried out in accordance with the plan of management. If the draft amendment to the KNP PoM currently on exhibition is accepted, the project would be consistent with KNP PoM.
Purpose of the KNP	
The EIS fails to consider the statutory purpose and identified values for which the KNP was gazetted under the NPW Act, as though it has no legal protection or status beyond any other category of Crown Estate or private land.	The consideration of the statutory purpose and identified values for which the KNP was gazetted under the NPW Act are discussed in **Section 4.2.1**.
Feasible Alternatives	
The EIS fails to comply with regulatory requirements of EP&A Regulation and the SEARs to include 'an analysis of any feasible alternatives' i.e. the EIS hasn't properly considered viable underground transmission alternatives (as outlined in the NPA's Background Paper and Addendum to the Open Letter to Minister Stokes and Kean, 18th January 2021).	The EIS included an assessment of project options and alternatives for the transmission connection as stipulated in Schedule 2 of the EP&A Regulation. Since exhibition of the EIS, Transgrid commissioned a comprehensive review and further analysis of the options included in the EIS as well as other potential and feasible options as documented in the Options Report which is provided in Appendix D and summarised in **Section 3.2.7.4**. The intent of the Options Report was to revisit the options assessment presented in the EIS and consider and assess the options put forward in the submissions received.
Visual Impact	
The visual impact/intrusiveness of the project would be far greater than any of the existing single-circuit transmission lines through the KNP – four 330kV lines; two sets massive steel lattice structures (up to 75 metres tall); traversing 8 kilometres of the Park within a cleared easement up to 200 metres wide, structures and lines visible over an area of 300 square kilometres.	The EIS provided a discussion on visual impact assessment in the body of the report, as well as the LCVIA provided as Appendix H. The LCVIA determined that the introduction of new permanent elements into the landscape would result in a change to the landscape character and visual setting of KNP and Bago State Forest. To help reduced the visual impacts of the project, the new structures would undergo accelerated ageing of the zinc galvanised coatings prior to erection. Further discussion on the project visual impacts is provided in **Section 4.3.8**. The project is required to be a double circuit as discussed in **Section 3.2.2** and **Section 4.1.1.2**.

Issue description	Response
Scale	
The EIS fails to justify the scale of the overhead option. Two 330kV circuits on a single set of structures would be sufficient, the structures need not be so tall, vegetation under the structures need not be cleared and the construction and ongoing maintenance could be performed by helicopters and drones, removing the need for access tracks.	The justification of the scale of the project is provided in **Section 4.1.1.2**.
Cumulative Impacts	
The EIS fails to consider cumulative impacts of the overhead lines on top of the other components of the Snowy 2.0 project, as well as the existing transmission lines within the KNP.	As discussed in **Section 4.2.1.3**, the cumulative impacts of the project were considered in Section 7.13 of the EIS. The assessment did consider the cumulative impacts of Snowy 2.0 and other projects in the vicinity of the project. The assessment also acknowledged the potential for cumulative impacts from the HumeLink and Line 64 upgrade projects. One of the project's key drivers was to avoid future impacts of HumeLink within KNP as such the evaluation criteria for the options assessment and analysis reflected this, refer to **Section 3.2**.
Mitigation Measures	
The EIS fails to propose best-practice environmental damage mitigation measures. Proposed mitigations are limited to the future preparation of a CEMP and associated sub-plans.	The EIS proposes various mitigation measures and these were not limited to the future preparation of a CEMP. The mitigation measures have been refined since the public exhibition of the EIS, and Transgrid will continue to engage with government agencies to further refine mitigation measures and develop and enhance long-term recreational values for KNP, refer to **Section 4.2.1.2**.
Public Interest	
The ultimate determinant of what is in the public interest is the KNP PoM, which prohibits additional overhead transmission lines. More overhead transmission lines are therefore "not in the public interest".	The long-term benefits of the project, when taken together with Snowy 2.0 Main Works project, are considered to be in the public interest as discussed in **Section 4.4.1.1**.
Environmental Impacts	
The EIS fails to adequately address environmental impacts of overhead transmission and focuses almost exclusively on the construction footprint, while ignoring the wider impacts (e.g. fragmentation of habitat, loss of connectivity, disruption of ecosystem processes, introduction of weeds & feral species into a largely undisturbed area of the KNP).	For the purposes of identifying and assessing environmental impacts of the project, a disturbance area (about 143 hectares) and broader project area (about 259 hectares) were defined in the EIS. The disturbance area encompasses the extent of physical disturbance (direct impacts) likely to be required to accommodate construction activities required for the project. The BDAR and the EIS did consider impacts such as fragmentation of habitat, loss of connectivity, disruption of ecosystem, introduction of weeds and feral species on a much broader scale (within the project area).

Issue description	Response
Economic Impacts	
The EIS provides inadequate justification of the financial benefits of overhead transmission.	The justification of the financial benefits of overhead transmission are discussed in **Section 4.4.2**. Potentially feasible underground connection options were up to five times higher in cost that than of the overhead connection to Line 64 (Option 4). As such, the overhead connection option to Line 64 addresses the economic criteria, but importantly it also satisfies all other evaluation criteria.
Validity of any Approval	
Underlying financial issues have distorted the EIS process to the extent that the validity of any approval of the project would be legally questionable. Although not stated, the cheaper up-front cost appears to be the primary reason/justification for overhead transmission, rather than environmental impacts. Cost should not be a consideration in the EIS process.	Cost is a legally relevant consideration. However, while cost was a consideration in the options assessment and analysis, it was not the only consideration, nor was it the most highly weighted. Refer to **Section 4.4.2**.
Precedent	
Approval of the project would set a precedent for further high impact transmission connections in environmentally sensitive landscapes.	The project is subject to Part 5, Division 5.2 of the EP&A Act which requires the preparation of an EIS in accordance with SEARs. The Minister for Planning and Public Spaces will decide whether to grant approval, or to refuse the proposal, under Section 5.19 of the EP&A Act based on the impacts as detailed in the EIS, the Submissions Report and the Amendment Report, refer to **Section 4.2.1.1**. For future transmission projects, The Minister for Planning and Public Spaces would decide whether or not to approve the future transmission projects based on the merits of the project and the assessment of the impacts described in the required EIS and Preferred Infrastructure or Amendment Reports if required.

C.15 Nature Conservation Council (NCC)

Table C-15 outlines the matters raised by the NCC and Transgrid's responses and/ or a reference to the section that responses to the issue.

Table C-6-15 Matters raised by Nature Conservation Council

Matters raised	Response
The transmission line should be located underground.	EIS has provided an argument justifying an overhead connection and an exemption/ amendment from the KNP PoM. Since the exhibition of the EIS, further options assessment and analysis has been carried out for several different connection alternatives. The further analysis of connection options found that the underground transmission options considered were not technically viable or they did not meet the evaluation criteria, refer to **Section 3.2** and **Appendix D**.
The EIS does not sufficiently investigate options to put transmission lines underground.	The EIS included an assessment of project options and alternatives for the transmission connection as stipulated in Schedule 2 of the EP&A Regulation. Since exhibition of the EIS, Transgrid commissioned a comprehensive review and further analysis of the options included in the EIS as well as other potential and feasible options as documented in the Options Report which is provided in **Appendix D** and summarised in **Section 3.2**. The intent of the Options Report was to revisit the options assessment presented in the EIS and consider and assess the options put forward in the submissions received.

Appendix D Transmission Connection Project for Snowy 2.0 -Options Report

Appendix E Supplementary landscape and visual impact assessment