OVEN MOUNTAIN PUMPED HYDRO ENERGY STORAGE

Submissions Report

August 2024

OVEN MOUNTAIN PUMPED HYDRO STORAGE | EMM creating opportunities

Oven Mountain Pumped Hydro Energy Storage Project

Submissions Report

OMPS Pty Ltd

E230869C Submissions Report1

August 2024

Version	Date	Prepared by	Approved by	Comments
1	20 June 2024	Daniel Nugent, Alex Frolich	Ruth Kelly	Draft
2	18 July 2024	Daniel Nugent, Alex Frolich	Ruth Kelly	Final Draft
3	19 July 2024	Daniel Nugent, Alex Frolich	Ruth Kelly	Final
4	20 August 2024	Daniel Nugent, Alex Frolich	Ruth Kelly	Updated Final

Approved by

Ruth Kelly
Associate Director – Environmental Planning & Approvals
20 August 2024

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Executive Summary

ES1 Introduction

OMPS Pty Ltd (the Proponent) is proposing to develop the Oven Mountain Pumped Hydro Energy Storage Project (the Project), an off-river pumped hydro energy storage system (referred to as the 'pumped hydro system') located approximately half-way between Kempsey and Armidale, adjacent to the Macleay River in northern NSW. The Project is located within the New England Renewable Energy Zone (REZ) and the Armidale Regional Local Government Area (LGA), proximate to its border with Kempsey Shire LGA.

At a basic level, the Project will consist of upper and lower water reservoirs and an underground tunnel connecting them via a hydro-electric power station. The pumped hydro system will be connected to the existing transmission network via new overhead high voltage transmission lines.

The Project is a scheme designed to provide utility-scale energy storage. It will provide up to around 900 MW of electricity generating capacity and at least eight hours of dispatchable energy to be stored and made available to the NEM through the New England REZ. The expected operational lifespan of the Project is in excess of 100 years.

The Project is State significant infrastructure (SSI) and critical State significant infrastructure (CSSI) and subject to Part 5, Division 5.2 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The Project is also a controlled action under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). As CSSI, the Project is critical to the State for environmental, economic or social reasons. The approval of the NSW Minister for Planning and Public Spaces and the Commonwealth Minister for the Environment is required before the Project can proceed.

A single EIS was prepared to address the requirements set out by the NSW Department of Planning, Housing and Infrastructure (DPHI) and the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW). 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 32 days, between 19 September 2023 to 20 October 2023.

DPHI requested OMPS prepare and submit a Submissions Report, detailing responses to issues raised, in correspondence to OMPS. Accordingly, this report has been prepared pursuant to clause 59(2) of the NSW *Environmental Planning and Assessment Regulation 2021* and in accordance with the *State Significant Infrastructure guidelines – preparing a submissions report* (DPHI, 2024). The purpose of this report is to consider and respond to submissions made by various government agencies, special interest groups and the community, in relation to the EIS for the Project.

ES2 Issues raised in submissions

Submissions were received from local councils and government agencies, organisations, and the community.

Submissions from Armidale Regional Council and Kempsey Shire Council raised several similar issues, including:

- concerns about roads and traffic, in particular the upgrading of Kempsey Armidale Road
- concern about the demand for accommodation and services as a result of the Project's workforce
- consideration of hazards and environmental impacts
- social and economic impacts and community benefits sharing.

Submissions from government agencies related to the specific agency focus.

Submissions from organisations and community raised several similar issues, including:

- The Project's design and operation, including key concerns such as access to site and road upgrades, flow and pumping rules for water take from the Macleay River, in particular with consideration of drought conditions, level of geotechnical and other information to inform design of a project of this scale.
- Insufficient and/or inadequate level of engagement carried out by the Proponent with the community.
- Technical approach and modelling presented in the EIS, such as surface water modelling and climate change considerations, adequacy of the Aboriginal Cultural Heritage Assessment field investigations, and deferred management of impacts.
- Environmental and social impacts of the Project, including (but not limited to) impacts to environmentally sensitive areas, biodiversity, Aboriginal cultural heritage, landscape values and disturbance of contaminated land.
- Justification of the Project, particularly with regard to consideration of alternative sites and other long term storage methods (such as batteries).

Comments of support were also received, primarily in relation to the renewable energy transition generally, as well as opportunities for the Project to create local employment and upskilling opportunities.

ES3 Updated assessment, mitigation and management

Based on the outcomes of design and constructability reviews carried out by the Proponent following exhibition of the EIS, as well as the issues raised in the submissions and stakeholder feedback received before, during and after the public exhibition, the Proponent is proposing several amendments and refinements to the project. These changes are detailed in a separate Amendment Report, as well as describes any changes in impacts because of the proposed amendments and how those impacts would be managed and mitigated. This Submissions Report should be read in conjunction with the Amendment Report.

This Submissions Report responds to the issues raised by local councils, government agencies, organisations and community. Key assessments have been updated and provided with this Submissions Report, including a Conceptual Landform Design of the Permanent Spoil Emplacement Areas report (Appendix D), surface water assessment (Appendix E), groundwater impact assessment (Appendix F), geochemistry assessment (Appendix G) and a climate change risk assessment (Appendix H). These assessments incorporate amendments to the Project and respond to key issues raised in submissions by:

- Providing an updated spoil emplacement design that responds to concerns of slope stability and long term suitability of the landform, and assessing associated geochemical and water quality impacts of the landform.
- Providing updated information, modelling and assessment of surface and groundwater impacts of the Project.
- Providing a risk assessment of Project infrastructure and opportunities for climate change adaptation.

The mitigation measures for the Project have been reviewed and updated where needed to incorporate stakeholder feedback and address the findings and recommendations of updated assessments.

ES4 Conclusion

There is a critical need to develop large-scale, renewable energy Projects to respond to the accelerated energy transition of the NEM. The Project is in the public interest and through the implementation of proposed mitigation, management and offsetting measures, the Project could be undertaken without any significant long-term impacts on the local environment.

The Project has been designed to avoid and minimise impacts where possible, and iteration to the design has occurred throughout the approvals process to incorporate stakeholder feedback. Based on issues raised in submissions as well as design and constructability reviews, the Proponent has proposed several amendments and refinements that are outlined in this Submissions Report but provided in detail in a separate Amendment Report.

The proposed approach to community engagement, if the Project is approved, is to focus on providing engagement activities and communication materials that provide up to date Project information to those likely to be affected during construction and also allow the community to communicate concerns with the Project.

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1 Introduction

1.1 Background

OMPS Pty Ltd (the Proponent) is proposing to develop the Oven Mountain Pumped Hydro Energy Storage Project (the Project), an off-river pumped hydro energy storage system (referred to as the 'pumped hydro system') located approximately half-way between Kempsey and Armidale, adjacent to the Macleay River in northern NSW. The Project is located within the New England Renewable Energy Zone (REZ) and the Armidale Regional Local Government Area (LGA), proximate to its border with Kempsey Shire LGA. Figure 1.1 and Figure 1.2 provide the regional and local context of the Project respectively.

At a basic level, the Project will consist of upper and lower water reservoirs and an underground tunnel connecting them via a hydro-electric power station.

Consistent with the objectives of the Electricity Strategy, Electricity Roadmap and the *Electricity Infrastructure Investment Act 2020*, the Project will play a key role in building the capacity of the National Energy Market (NEM), managed by the Australian Energy Market Operator (AEMO) and the NSW renewable energy system to reduce the risk of blackouts and electricity price volatility. It will provide vital long duration energy storage, electricity network benefits and services directly to the transmission backbone in the New England REZ. The Project will aid in the transition of the NEM towards cleaner, more reliable and affordable electricity by supporting around 1,600 megawatts (MW) of new renewable energy projects and placing downward pressure on power prices.

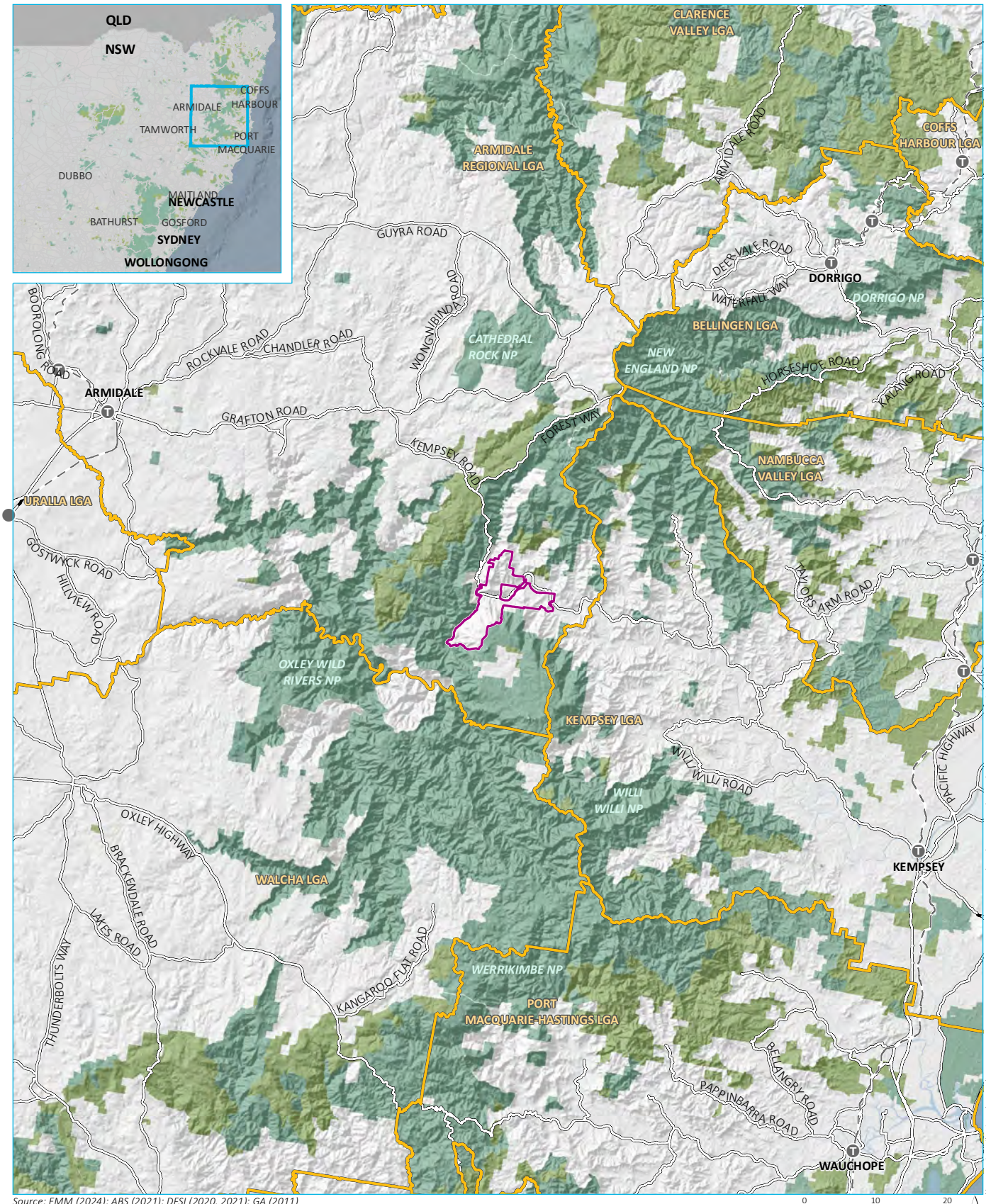
The Project involves building two 'off river' water containment structures to create an upper and a lower reservoir (referred to as 'the upper dam and reservoir' and 'the lower dam and reservoir' respectively), on an ephemeral tributary of the Macleay River. An underground hydro-electric power station complex will be connected to the reservoirs by infrastructure including a power waterway and tunnels. The power station complex will effectively have three operating modes: energy generating mode, pumping mode, and synchronous condenser, enabling the water to generate electricity as it passes through the underground power station while moving from the upper to the lower reservoir, from where it is pumped back up via the same waterway in a 'closed-loop circuit'. The pumped hydro system will be connected to the existing transmission network via new overhead high voltage transmission lines.

The Project is a scheme designed to provide utility-scale energy storage. It will provide up to around 900 MW of electricity generating capacity and at least eight hours of dispatchable energy to be stored and made available to the NEM through the New England REZ. The expected operational lifespan of the Project is in excess of 100 years.

The Project will utilise the highly favourable natural terrain of the site on which it sits to allow electrical energy from the main grid to be stored by pumping water from the lower dam and reservoir to the upper dam and reservoir. Energy can then be generated when needed by allowing water to flow back down to the lower dam and reservoir via the hydro-electric power station, effectively enabling the Project to act as a large battery.

Water from the Macleay River will be used for the initial one-off filling of the reservoirs and for sporadically required top ups, which are expected to be minimal. The filling will occur during periods of high water flow in the river and will not impact downstream water users.

Other components of the Project will include the construction of and upgrades to internal access roads, the construction of an electrical substation, and the construction of up to two high voltage transmission lines (132 kilovolt (kV) and 330 kV) that will connect the pumped hydro system to the high voltage transmission lines that connect Kempsey and Armidale (known as Line 965).



Source: EMM (2024); ABS (2021); DFSI (2020, 2021); GA (2011)

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KEY

- Project area
- Train station
- Rail line
- Major road
- Named waterbody
- Local government area
- NPWS reserve
- State forest

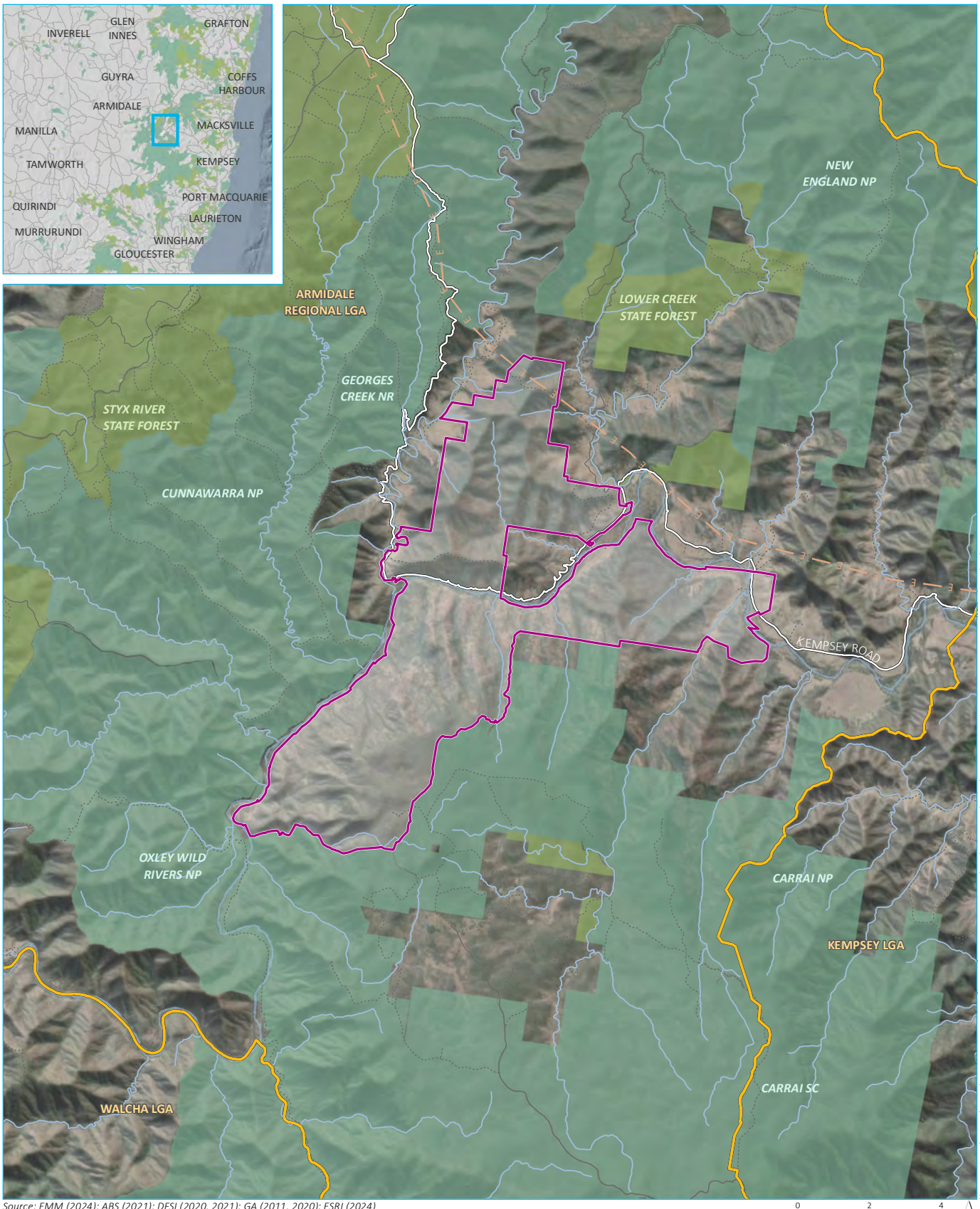
INSET KEY

- Major road
- NPWS reserve
- State forest

Regional setting

Oven Mountain Pumped Hydro Energy Storage Project
Submissions Report
OMPS Pty Ltd
Figure 1.1

EMM creating opportunities



Source: EMM (2024); ABS (2021); DFSI (2020, 2021); GA (2011, 2020); ESRI (2024)

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KEY

- Project area
- Existing transmission line
- Major road
- Minor road
- Vehicular track
- Named watercourse
- Named waterbody
- Local government area
- NPWS reserve
- State forest

INSET KEY

- Major road
- NPWS reserve
- State forest

The Project area - local context

Oven Mountain Pumped Hydro Energy Storage Project
Submissions Report
OMPS Pty Ltd
Figure 1.2

EMM creating opportunities

1.2 Approval process

The Project has been declared State significant infrastructure (SSI) and critical State significant infrastructure (CSSI) in accordance with the provisions of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The declaration of the Project as a CSSI project acknowledges that the Project is 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 Environmental Impact Statement (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 deemed a controlled action under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and requires 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.

A single EIS was prepared to address the requirements set out by the NSW Department of Planning, Housing and Infrastructure (DPHI) and the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW). 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 32 days, between 19 September 2023 to 20 October 2023.

A total of 90 submissions were received during the public exhibition period, including 11 from organisations and 62 individual community submitters. In addition, 17 submissions were received from state government agencies and councils. Of the 90 submissions, 21% were in support the Project, 56% objected to the Project, and the remaining submissions provided comments (23%). A detailed analysis of matters raised in the submissions is set out in Chapter 2.

1.3 The Project

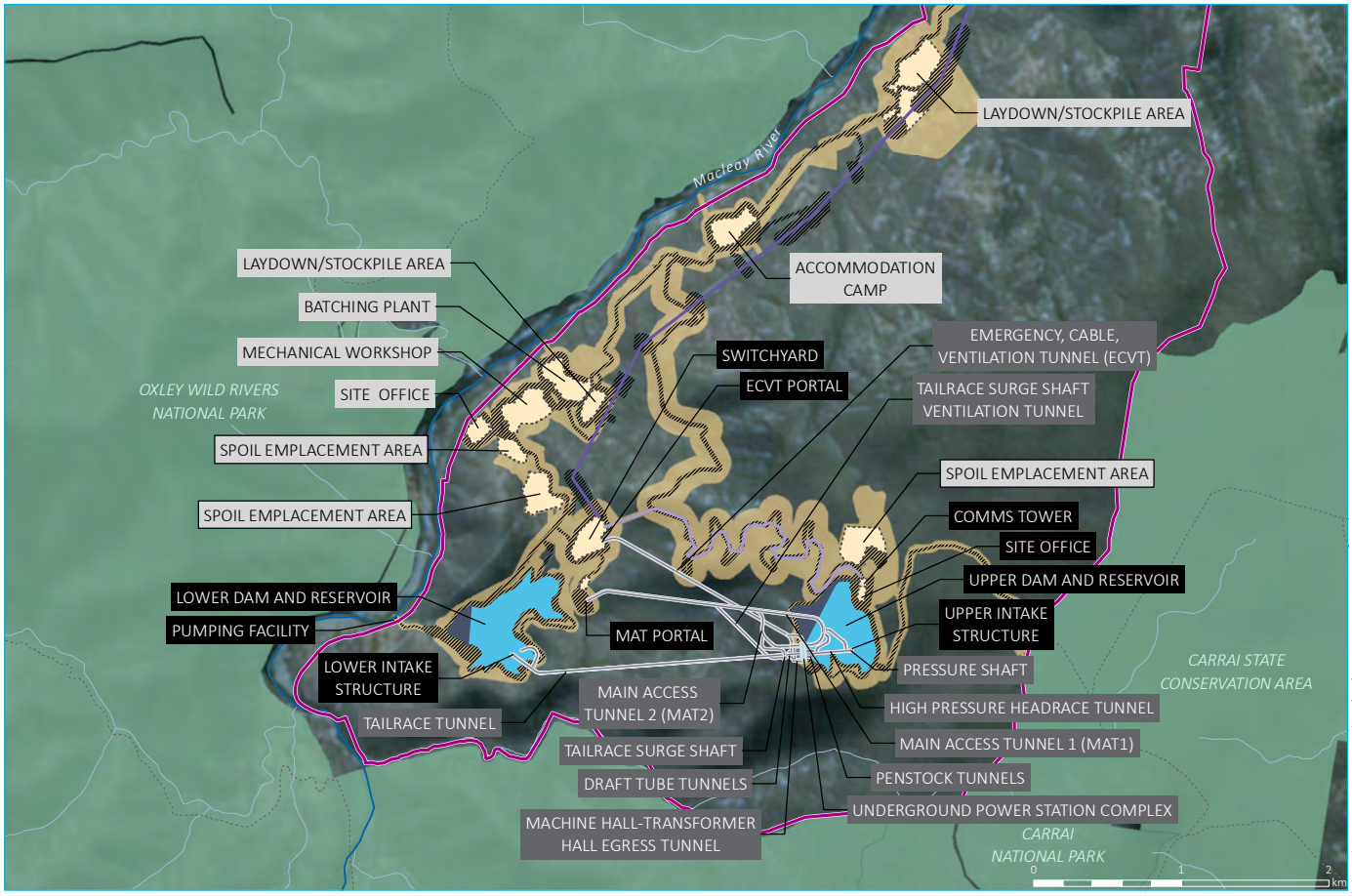
1.3.1 Key elements of the exhibited project

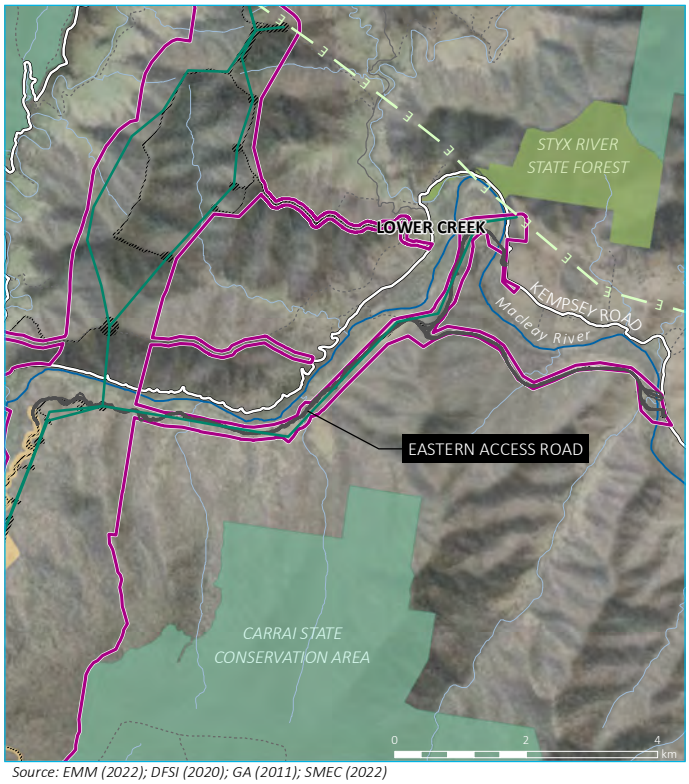
The key elements of the exhibited Project include permanent infrastructure needed to operate the Project including water intakes, storage reservoirs, underground power station and other elements such as transmission lines. A series of temporary construction elements are needed to support building of this permanent infrastructure. A summary of the Project as exhibited in the EIS is provided in Table 1.1 and shown in Figure 1.3.

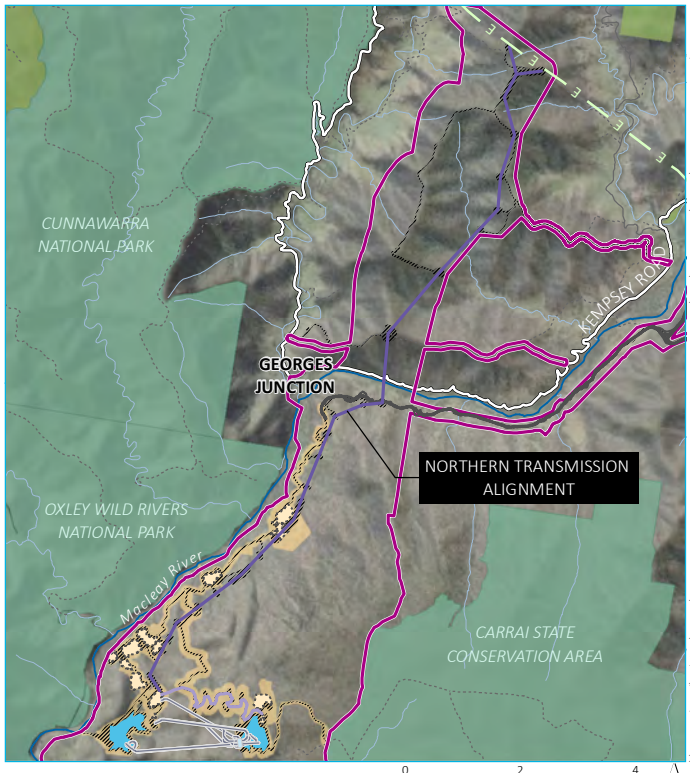
Table 1.1 OMPS EIS summary

Project element	Summary of the Project
Project area	The Project area is adjacent to the Macleay River and Carrai State Conservation Area to the east. Cunnawarra National Park, Oxley Wild Rivers National Park (OWRNP), and the Carrai National Park are also proximate to the Project area with declared wilderness areas to the east of the Project area.
Pumped hydro generation works	Pumped hydro generation infrastructure to be built and operated for the life of the asset includes: • Underground power station complex. • Two concrete faced rockfill dams and reservoirs, referred to as the upper dam and reservoir and lower dam and reservoir. • Two water intake structures, one at each reservoir. • Two concrete lined spillway chutes, one for each reservoir. • Macleay River pump facility. • Access tunnels (and tunnel portals) to the underground power station comprising the main access tunnel (MAT) and emergency, cable and ventilation tunnel (ECVT). • Power waterway.

Project element	Summary of the Project
Transmission connection works	Transmission infrastructure to be built and operated for the life of the asset includes: • Connection works including an approximately 15 km long alignment comprising, at a maximum, 330 kV double circuit overhead line and a 132 kV single circuit overhead line, up to 25 towers and an easement width of approximately 105 m. • A substation rated up to 330 kV. • A switchyard linking the connection transmission lines to the cables exiting the underground power station complex.
Ancillary development (construction and operation)	Ancillary development both temporary and permanent: • Access roads, access tracks and bridge crossing, including Main Access Road, Eastern Access Road, Lower Dam Access Road, Upper Dam Access Road, access to portals and underground works, Upper Dam Emergency Egress Road, Northern Transmission Access Road and Transmission Tower 8 Access Road; the road connection with the existing Kempsey Armidale Road will require the construction of at least one new single- or two-lane low-level bridge crossing over the Macleay River. • Surface works pads and facilities, including main accommodation camp, temporary or fly camps, work areas for concrete batching plants, staging areas, stockpiling areas, temporary site offices. • Communication infrastructure such as fibre optic cables. • Utilities during construction including water storage systems and construction power. • Utilities for operation including electricity and water. • Water diversion and water treatment facilities. • Spoil emplacement areas (three locations to store around 2.9 Mm^3 plus dead storage within reservoirs). • Ancillary operational facilities.
Disturbance footprint	The disturbance footprint represents the physical disturbance that can be expected as part of the construction works. As the design is refined, the final siting of the disturbance footprint can move within the construction envelope, subject to the recommended environmental management measures, and provided it does not exceed any limits as defined by the construction envelope. The disturbance footprint for the Project covers an area of around 330 ha.
Operational footprint	The operational footprint is the area required for permanent infrastructure to operate the Project. The maximum operational footprint is about 60 ha.
Construction	Construction duration of around four to five years. Construction workforce of over 600 workers at construction peak.
Rehabilitation	Rehabilitation of areas disturbed during pre-construction and construction will be undertaken progressively where practical during all stages and phases of the Project.
Operation	It is expected that the operation of the new power station will require around 30–50 full-time workers, as well as additional contractors for regular and ad hoc maintenance and repairs. The operational life of the Project is estimated to be 100+ years.
Hour of operation	Construction and operation of the Project will be 24/7 and 365 days per year.
Capital investment value	Estimated to be a base cost of approximately $1.97 B.







Source: EMM (2022); DFSI (2020); GA (2011); SMEC (2022)

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KEY

- Project area
- Disturbance footprint
- Construction envelope
- Surface

Project operational elements

- Underground power station complex
- Power and communications lines
- Transmission overhead lines
- Tunnels, portals, intakes, shafts
- Permanent road
- Reservoir
- Dam wall

Existing environment

- Macleay River
- Watercourse/drainage line
- Kempsey-Armidale Road
- Vehicular track
- Existing transmission line
- NPWS reserve

Label format

- SURFACE PERMANENT INFRASTRUCTURE
- UNDERGROUND PERMANENT INFRASTRUCTURE
- TEMPORARY INFRASTRUCTURE
- PERMANENT SPOIL EMPLACEMENT

The Project as exhibited

Oven Mountain Pumped Hydro Energy Storage Project
Response to Submissions
OMPS Pty Ltd
Figure 1.3

EMM creating opportunities

1.3.2 Key refinements since public exhibition

Amendments and refinements to the design have been made since public exhibition of the EIS. This was done in response to feedback from stakeholders and to accommodate further development of the concept design, which aimed to optimise operation and minimise environmental impacts during construction where possible.

A separate Amendment Report has been prepared which outlines the proposed amendments and refinements to the Project since public exhibition of the EIS and assesses the environmental impact of these changes.

Key proposed amendments to the Project as identified in the Amendment Report include the following:

- **Underground arrangement and sizing.** Optimised underground arrangement and sizing to confirm a 900 MW generation scheme with at least eight hours energy storage.
- **Internal roads and bridges.** Realignment and optimisation of internal roads, including two new temporary bridges across the Macleay River. This has been undertaken to:
    - Avoid direct impacts on the habitat of the brush tailed rock wallaby and in response to submissions from Biodiversity, Conservation and Science (BCS) Directorate of DCCEEW.
    - Improve construction access and reduce overall construction timing.
    - Improve cut and fill balance to reduce requirements of permanent spoil emplacement associated with road works.
- **Revised construction methods and requirements.** This includes the need for additional blasting, rock crushing/processing, estimated construction water usage, and temporary or 'fly' camps. This has been undertaken to optimise construction timing and reduce pressure on local accommodation sources, in response to submissions from various bodies.
- **Revised laydown areas and spoil emplacement designs**. This has been undertaken to:
    - Accommodate spoil volumes which have been amended with refinements in the design.
    - Avoid direct impacts and minimise indirect impacts to Pultenaea sp. Werrikimbe NP (*Pultenaea rubescens)* and in response to submissions from BCS.

All proposed amendments and refinements are described in detail in Chapter 3 of the Amendment Report. As noted above, some of these amendments have been undertaken in response to submissions. As such, they are discussed in this report in relation to the submissions received. However, the technical assessments of those amendments are all provided in the Amendment Report. For clarity, the two reports are separate but are linked and can be read concurrently.

1.4 Purpose of this report

DPHI requested OMPS prepare and submit a Submissions Report, detailing responses to issues raised, in correspondence to OMPS. Accordingly, this report has been prepared pursuant to clause 59(2) of the NSW *Environmental Planning and Assessment Regulation 2021* and in accordance with the *State Significant Infrastructure guidelines – preparing a submissions report* (DPHI, 2024). The purpose of this report is to consider and respond to submissions made by various government agencies, special interest groups and the community, in relation to the EIS for the Project.

1.5 Document structure

The submissions report consists of the main document and supporting appendices and is structured as follows:

- **Chapter 1 – Introduction** (this chapter): introduces the Project, including providing an overview on the Project, approval process, and the purpose and structure of this report.
- **Chapter 2 – Analysis of submissions**: Provides a detailed summary of the submissions received on the Project, including from where the submissions were received, and the key issues raised in submissions.
- **Chapter 3 – Actions taken since exhibition**: Describes the activities undertaken by OMPS since exhibition of the EIS, including project refinements, additional technical studies and stakeholder engagement activities undertaken. This chapter also outlines the proposed approach to the Project's post approval environmental management framework.
- **Chapter 4 – Response to Government agency submissions:** Provides response to matters raised by government agencies in their submissions on the EIS and the accompanying technical studies undertaken for the Project.
- **Chapter 5 – Response to community and special interest groups submissions:** Provides responses to matters raised by community members and special interest groups on the EIS and the accompanying technical studies undertaken for the Project.
- **Chapter 6 – Updated evaluation of merits.**
- **Appendices:** The appendices to the Submissions Report which support the document are:
    - Appendix A – Submissions Summary
    - Appendix B – Submissions Register
    - Appendix C – Updated Mitigation Measures
    - Appendix D – Conceptual Landform Design of the Permanent Spoil Emplacement Areas
    - Appendix E – Surface Water Assessment
    - Appendix F – Groundwater Impact Assessment
    - Appendix G – Geochemistry Assessment
    - Appendix H – Climate Change Risk Assessment.

2 Analysis of submissions

2.1 Overview

The EIS was publicly exhibited from 19 September 2023 to 20 October 2023. Following the public exhibition period, 90 submissions were received by DPHI. Of these, 62 submissions were from the community (consisting of unique submissions), 11 from organisations, and 17 from government agencies.

Of the community submissions received, 17 submissions (i.e. 27%) were in support, 41 submissions were in objection and 4 submissions provided comments. In addition, of the submissions from organisations, two supported the Project, seven objected to the Project and two provided comments.

Submissions are available to view on DPHI's website at the link below.

https://www.planningportal.nsw.gov.au/major-projects/projects/oven-mountain-pumped-hydro-energy-storage

During the exhibition period, USB copies of the EIS documents were provided at the following locations:

- Oven Mountain Community Hub (Kempsey)
- Kempsey Shire Council offices (Kempsey)
- Dunghutti Elders Council (Kempsey)
- Armidale Regional Council offices (Armidale)
- Kempsey Library (Kempsey)
- Armidale library (Armidale).

In addition to the distribution of the EIS on USBs, a letterbox drop of the Summary of Findings booklet was undertaken more widely. This letterbox drop targeted the Bellbrook Hotel, Willawarrin Hotel, and landowners along the Kempsey Armidale Road and the Carrai.

A breakdown of the submissions is provided in Table 2.1.

Table 2.1 Summary of submissions received

Source/type	Objects	Supports	Comment	Total
Government	2	-	15	17
Organisation	7	2	2	11
Community	41	17	4	62
Total	**50**	**19**	**21**	**90**

The NSW Government agencies and organisations (or special interest groups) that provided submissions are shown in Table 2.2.

Table 2.2 Summary of NSW Government and special interest group submitters

Government	• Armidale Regional Council. • Civil Aviation Safety Authority (CASA). • Dams Safety NSW. • DPE Crown Lands. • DPE Water (now NSW Department of Climate Change, Energy, the Environment and Water). • Environment Protection Authority (EPA). • Fire and Rescue NSW (FRNSW). • Heritage Council of NSW (HCNSW).	• Kempsey Shire Council. • NSW Biodiversity Conservation Division (BCD) (incl National Parks and Wildlife Service (NPWS)). • NSW Department of Primary Industries (DPI) – agriculture. • NSW DPI – fisheries. • NSW Mining Exploration and Geoscience (MEG) Dam Safety. • NSW MEG Land Use. • NSW Rural Fire Service (RFS). • Transport for NSW (TfNSW). • Water NSW.
Special interest group	• Armidale Branch National Parks Association. • Community Power Agency. • Freshwater group. • Kempsey Speleology Society.	• Macleay Valley Aboriginal Community Controlled Forum. • North Coast Environmental council. • Save Our Surroundings (SOS). • Save Our Macleay River Inc. • Voice for Walcha.

2.1.1 Location of submitters

The type and location of submitters is presented in Figure 2.1. Local submitters (those within Carrai, Jeogla, Lower Creek, Comara, Bellbrook, Hillgrove, Wollomombi and Metz suburb and localities) comprised about 9% of all submissions. All other submissions were made by community and special interest groups located in all other suburbs or LGAs, nationally.

Of those 9%, local submitters generally provided support for the Project (74%), with a small number of submitters providing comment (13%) or opposing the Project (13%).

It should be noted that under the guidelines for the preparation of a Submissions Report, 'local' is defined as <5 km from the site and 'regional' as 5–100 km from the site. However, this report defines 'local' as stakeholders who could potentially be directly or indirectly affected by the Project. This includes landowners, nearby neighbours, community members, businesses, service providers and indigenous groups who may have an interest in the Project and who could be impacted. This includes the Project area located in Lower Creek and extends from Metz and Hillgrove to the north and to Bellbrook in the south. This was taken as an alternate approach because the remote nature of the Project would preclude the majority of submissions.

2.2 Issues raised in submissions

This section provides details of the issues raised in the submissions received.

2.2.1 Response methodology

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

- community and special interest group
- individual community member
- council and state government agencies.

In accordance with the *State significant infrastructure guidelines – preparing a submissions report* (DPHI, 2024), each matter raised in submissions has been assigned to one of the following guideline categories:

- the project (e.g. the site, the physical layout and design, uses and activities and timing)
- procedural matters (e.g. level of quality of engagement, compliance with SEARs, identification of statutory requirements)
- the environment, social or economic impacts of the Project (e.g. noise, air quality, biodiversity, heritage)
- the merits of the project (e.g. justification for the project, consistency with government plans, policies or guidelines)
- issues that are beyond the scope of the project or not relevant to the project.

The submissions were reviewed, and the key matters raised in each submission identified. To ensure a structured approach to responding to the submissions, each matter raised was grouped by category and then sub-category. These categories and sub-categories were determined through consideration of key issues and topics raised, aligning with the content of the EIS and technical assessments prepared as part of the EIS. The categories and sub-categories identified through the review of key matters are provided in Table 2.3 below.

Responses were prepared to each matter raised in submissions by OMPS and EMM, with input from relevant technical specialists.

Responses to submission from the local councils and government agencies are provided in Chapter 4 and Chapter 5, respectively, with each comment summarised by matters raised followed directly with a response. Responses to matters raised in community and special interest groups submissions are provided on a theme basis in Chapter 6.

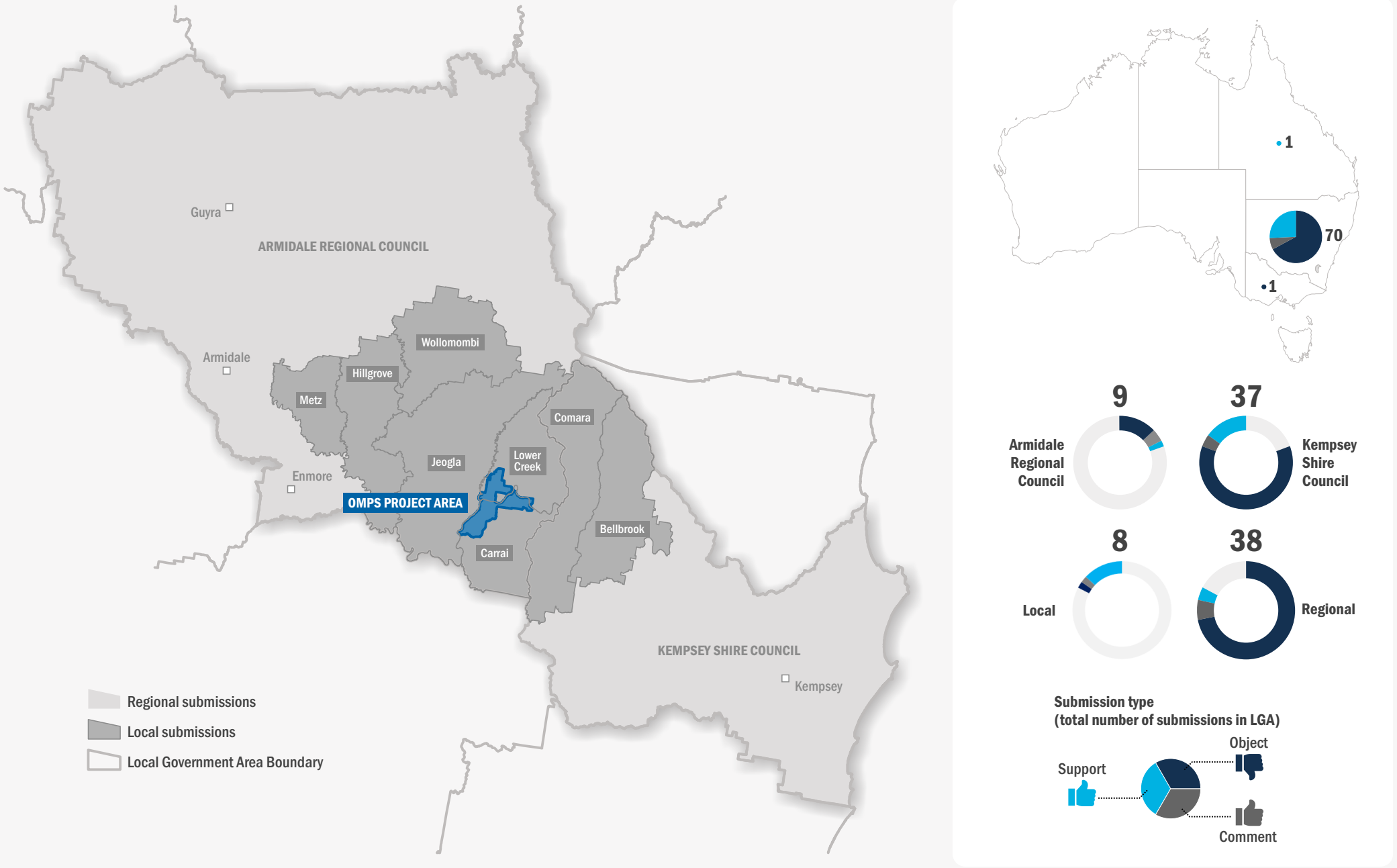
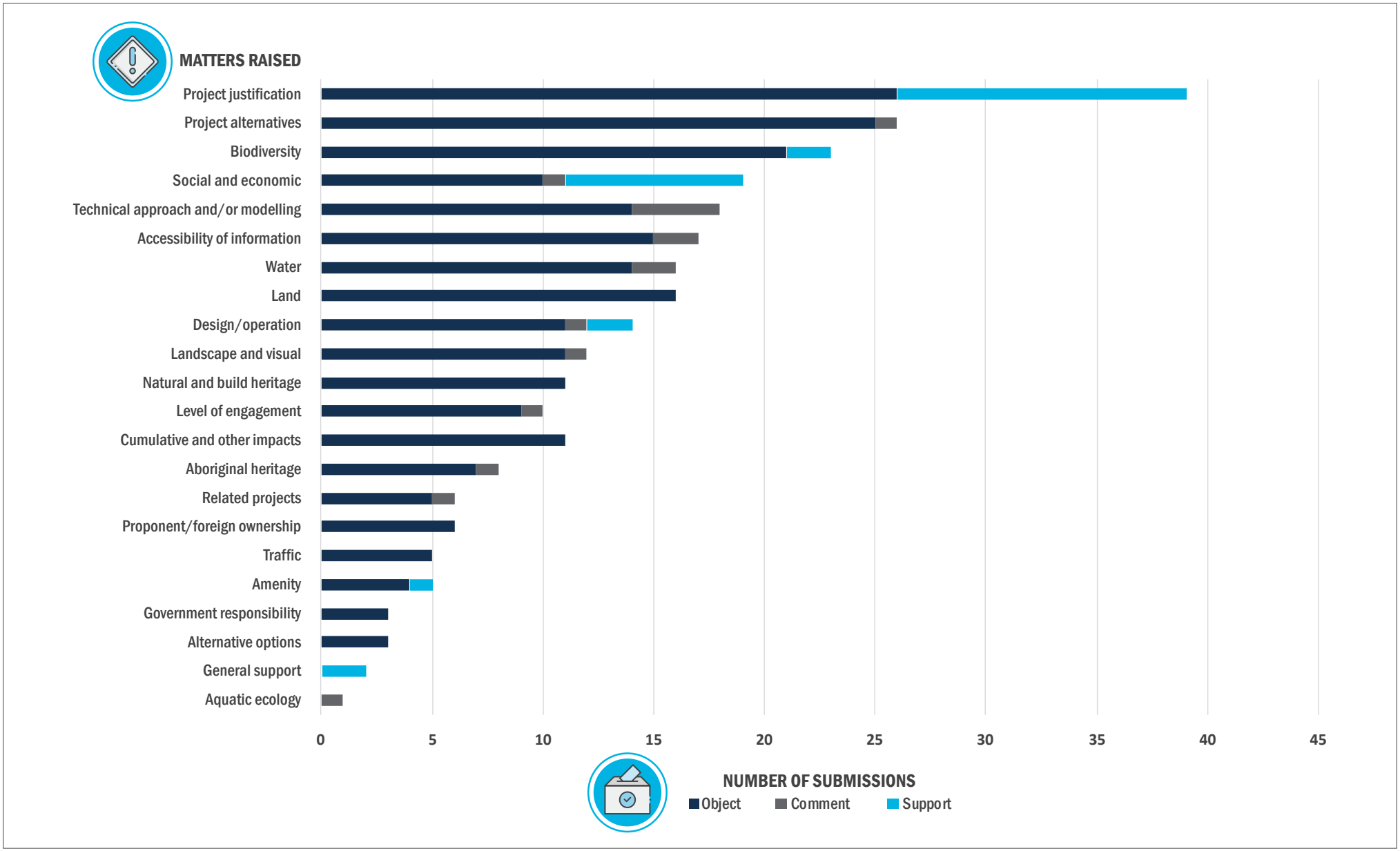


Figure 2.1 **Origin of organisation and community submissions**



Matters raised in organisation and community submissions

Figure 2.2

Table 2.3 Themes identified to categorise submissions

Guideline category (DPHI 2024)	Category	Subcategory
The project	Design/operation	Pump infrastructure
		Road design and upgrades
		Operating rules
		Geotechnical information
	Alternative options	Alternative PHES sites
		Transmission lines
	Related projects	Upgrade of Transmission Line 965
		Upgrade of Kempsey Armidale Road
Procedural matters	Accessibility of information	Quantum or quality of information
		Deferred assessment or management
		Notification and timing of EIS public exhibition
		Confidential information
	Technical approach and/or modelling	Surface water
		Biodiversity and offsetting
		Aboriginal cultural heritage assessment (ACHA)
		Climate
	Level of engagement	Community engagement
		First Nations engagement
		Government agency and Council engagement
Environment, social or economic impacts of the project	Aboriginal heritage	Cultural heritage values and impacts
	Amenity	Dust
		Noise
		Historic East Kunderang Station
	Aquatic ecology	Aquatic ecosystem impacts
	Biodiversity	Biosecurity risk
		Threatened species and habitat
		Native wildlife and habitat
		Indirect impacts (edge effects, vehicle strike, etc.)
		Offsets
		Environmentally sensitive areas (National Parks, wilderness)

Guideline category (DPHI 2024)	Category	Subcategory
	Land	Soils and erosion
		Geochemistry and contamination risks
		Stability
	Landscape and visual	Landscape impacts
		Long term rehabilitation and/or decommissioning/end of life
		Transmission structures
	Natural and built heritage	Impacts to listed heritage values
		Landscape change
	Cumulative and other impacts	Health risk (transmission)
		Climate change and greenhouse gas
		Waste
		With other projects
	Social and economic	Housing pressure and property values
		Business and employment
		Access to services
	Surface water	Water quality
		Water security, licenses and allocation
		Hydrology and flows
	Traffic	Traffic generation
		Road safety
Merits of the project	Project justification	Project cost and investment
		Renewable energy/network benefits
		Energy prices and consumer impacts
		Economic growth and opportunity
		Energy efficiency
	Project alternatives	Other long-term storage methods
		Other suitable PHES sites
Issues beyond the scope of the project or not relevant to the project	Proponent/foreign ownership	-
	Government responsibility	-

Responses were prepared to each matter, with input from technical specialists who prepared the relevant impact assessment for the EIS.

2.3 Summary of matters raised in community and special interest submissions

2.3.1 Support

Twelve community submissions and seven special interest group submissions provided support on the Project. Key themes raised in these submissions relate predominately to:

- create local employment and upskilling opportunities
- general support for renewable energy projects
- provide energy storage capacity and power system resilience to the New England Renewable energy zone
- contributing to the transition to net zero.

2.3.2 Comments

Four community submissions and two special interest group submissions provided comments on the Project. Key themes raised in these submissions relate predominately to:

- level of engagement and consultation with the indigenous communities
- potential impact on Aboriginal artefacts
- potential impacts on aquatic ecosystems and downstream water users
- water licensing and conditions of pumping within the Macleay Gorge water source area
- potential cumulative impact of vegetation loss.

2.3.3 Objections

Seven special interest groups and 41 community submissions raised objections to the Project. The objections included one from the local area (those within Carrai, Jeogla, Lower Creek, Comara, Bellbrook, Hillgrove, Wollomombi and Metz suburb and localities) and the rest from regional submitters. The primary concern expressed in the sole local submission centred around the anticipated rise in traffic near the submitter's residence. While expressing overall in principle support for the Project, the submitter emphasised conditional backing, contingent on the provision of a crossing at Georges Junction so Project traffic is reduced past their residence.

The themes raised in the remaining objections relate predominantly to:

- Justification of the Project, particularly with regard to consideration of alternative sites and other long term storage methods (such as batteries).
- The Project's design and operation, including key concerns such as:
    - Access to site and road upgrades, specifically to the Kempsey Armidale Road; many individuals raised comments for heavy vehicle traffic, safety concerns and Council rate increases as key concerns.
    - Flow and pumping rules for water take from the Macleay River, in particular with consideration of drought conditions.
    - Insufficient level of geotechnical information to inform design of a project of this scale.

- Impacts of the Project, including (but not limited to) impacts to environmentally sensitive areas, biodiversity, Aboriginal cultural heritage, landscape values and disturbance of contaminated land.
- Technical approach and modelling presented in the EIS, such as surface water modelling and climate change considerations, adequacy of the Aboriginal Cultural Heritage Assessment field investigations, and deferred management of impacts.
- Insufficient and/or inadequate level of engagement carried out by the Proponent with the community.

3 Actions taken since exhibition

3.1 Project amendments

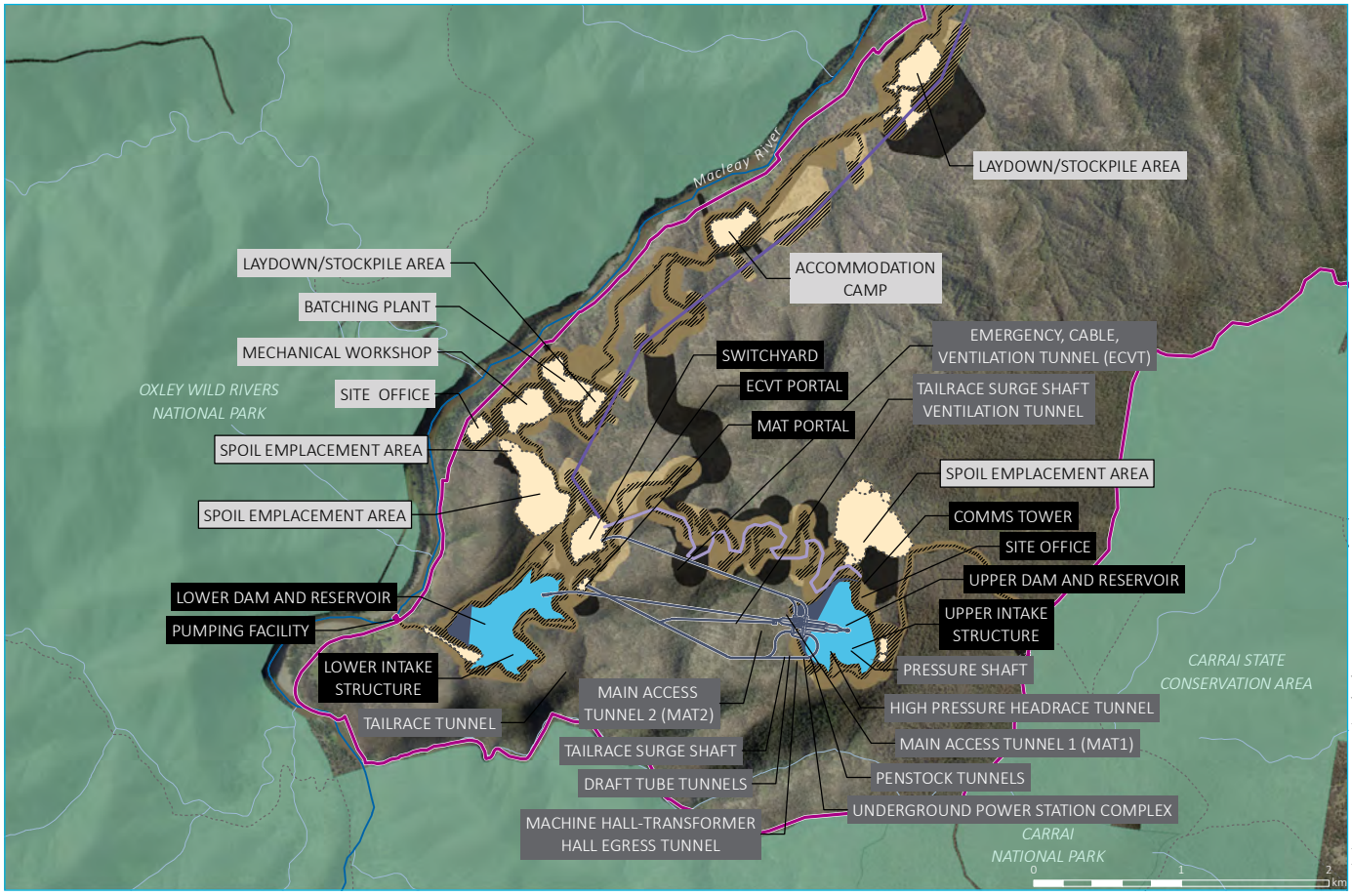
A review of the Project design and constructability was carried out following exhibition of the EIS and with consideration of regulator feedback and comments raised during the submission period. This review identified the need for several amendments to the Project. Wherever possible, the aim was to continue to avoid and minimise environmental impacts. However, this was not achievable in all instances due to the need to prioritise worker safety and the need to balance some environmental aspects over another. A detailed description of each of the proposed amendments, justification for the proposed amendments, and updated environmental assessments (where required), are provided separately within an Amendment Report.

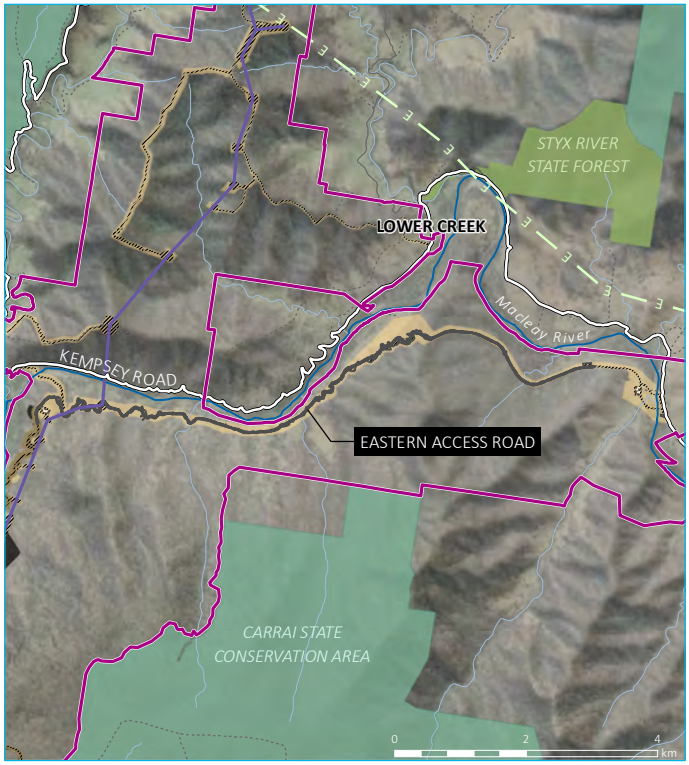
An overview of Project amendments is provided in Table 3.1 and shown in Figure 3.1. As part of these amendments, the Project area, construction envelope, disturbance footprint and operational footprint, have consequently all been revised to accommodate stakeholder feedback, design changes and refined construction requirements.

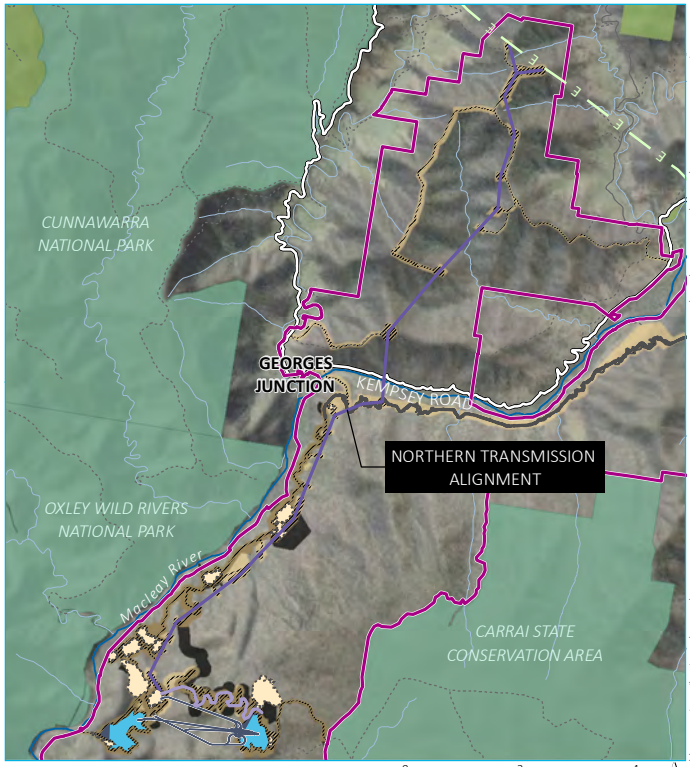
Table 3.1 Overview of the project amendments

Project element	Description of amendment
Internal roads and bridges	
Eastern Access Road (EAR) refinement	Realignment of the EAR to reduce need for earthworks, improve road safety and address drainage issues.
Bridges	A temporary bridge will be utilised prior to the construction of the two permanent bridges near Smiths Bluff (referred to as Eastern Access Temporary Bridge). A secondary, temporary access is proposed via the construction of a new, temporary bridge crossing of the Macleay River about 600 m upstream and north-east of Georges Junction (referred to as Western Access Temporary Bridge). This amendment is proposed to reduce the period of internal road construction and therefore overall construction period, and improve effectiveness of emergency response measures (access and egress) during construction.
Upper Dam Access Road (UDAR) refinement	Realignment of the UDAR (including removal of a large north-south connecting section of road) in response to regulator feedback to avoid known habitat and potentially significant impacts to the threatened Brush-tailed Rock Wallaby.
Construction methods and requirements	
Temporary or fly camps	While fly camps were previously anticipated for the Project, up to three fly camps are confirmed to be required and will be located near Smith's Bluff, the intersection of the Main Access Road and the EAR and the upper reservoir (within spoil emplacement area). The camps will each accommodate about 20 workers and up to 90 workers depending on the ultimate configuration, and would be established within the first year of construction.
Blasting and rock crushing/processing	Allowing blasting as a construction method for road works and other above-ground works, which is likely to be required based on findings of more recent geotechnical investigations. Rock processing/crushing facilities will be required in the lower reservoir (LR) and upper reservoir (UR) areas to process rock for use in dams.
Construction water requirements	Increasing the estimated water requirements for use in construction (e.g. dust suppression, concrete batching, etc.) from 1 ML/day to 3 ML/day.

Project element	Description of amendment
Spoil and materials	
Laydown/stockpile areas	There will be four areas used for stockpiling and material laydown instead of two. One area is located along the main access road (between transmission towers 14–16), one area is located in proximity to the batching plant, one area is located near Georges Junction, and one is located near the Eastern Access Temporary Bridge on the eastern side of the Macleay River. The largest of the four areas has also been flagged as available for other ancillary uses.
Spoil emplacement	To take into account spoil quantities generated from an optimised 900 MW design and stakeholder feedback regarding landform and erosion risks, spoil emplacement areas have been re-designed. Two permanent spoil emplacement (PSE) areas are now proposed, with the areas both having increased in size to accommodate revised spoil estimates, reduced stockpile heights and slope angles.
Underground arrangement and sizing	
Underground arrangement and sizing for improved generation capacity	The Project will provide up to around 900 MW of electricity generating capacity and at least eight hours of energy storage at full generating capacity. The amended underground arrangement and tunnel sizes reflect greater energy storage capacity and re-location of MAT portal is proposed to align with amended arrangement.







Source: EMM (2024); BECA (2022); AECOM (2023); OMPS (2024); SMEC (2024); DFSI (2020); GA (2011)

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KEY

- Project area
- Disturbance footprint
- Amended construction envelope
- Exhibited construction envelope
- Surface works

Project operational elements

- Power and communications lines
- Transmission overhead lines
- Tunnels, portals, intakes, shafts
- Permanent road
- Reservoir
- Dam wall

Existing environment

- Macleay River
- Watercourse/drainage line
- Kempsey-Armidale Road
- Vehicular track
- Existing transmission line
- NPWS reserve

Label format

SURFACE PERMANENT INFRASTRUCTURE

UNDERGROUND PERMANENT INFRASTRUCTURE

TEMPORARY INFRASTRUCTURE

PERMANENT SPOIL EMPLACEMENT

The amended Project

Oven Mountain Pumped Hydro Energy Storage Project
Response to Submissions
OMPS Pty Ltd
Figure 3.1

EMM creating opportunities

3.2 Stakeholder engagement

3.2.1 Introduction

OMPS actively engaged with the community throughout the design phase of the Project and during the preparation of the EIS. The purpose of this engagement was to obtain further feedback and inform and update stakeholders about the Project. This engagement continued throughout the public exhibition period and remains ongoing. This section describes the additional consultation that has taken place since the public exhibition of the EIS.

3.2.2 Community engagement

i Local community

OMPS has actively sought to inform the local communities about the Project in a number of ways. Since the exhibition of the EIS, OMPS has issued two Project updates, December 2023 and March 2024, marking important planning milestones, providing a response to submissions update and a notification that the application for community grants had opened. OMPS has also attended local events such as the Kempsey show (9 to 10 April 2024) with an information stall and presented to the local rotary (19 March 2024). As a part of demonstrating the Proponent's commitment to inclusive and transparent ways of working, on 16 April 2024 the Proponent co-ordinated an onsite cultural heritage inspection at the request of the Dunghutti Edlers Council (Aboriginal Corporation) Board of Directors, in partnership with members key cultural heritage and knowledge holders of the Thunggutti Local Aboriginal Land Council.

The Project webpage has been maintained and updated as required during the response to submissions phase and all newsletters and community information released to date is available to the general public at: https://www.ompshydro.com/. Project related news has included the ongoing geotechnical investigations, Kempsey-Armidale Road traffic notifications, community grant applications and local events such as the Saltwater Freshwater Festival 2024.

Another Project update will be issued to coincide with the lodgement of the Submissions Report and Amendment Report to DPHI.

OMPS is engaging with a nearby landholder regarding the potential of establishing a biodiversity stewardship site to meet a portion of the Project's biodiversity offset credit liability.

Should the Project be approved, the Proponent will continue to develop productive working relationships with the local community. This will include Project updates and briefings in person and via their social media platforms. In addition, this will be achieved by establishing a Community Consultation Committee (CCC) in accordance with DPHI guidelines. To demonstrate impartiality towards key stakeholder concerns, an independently chaired CCC will facilitate structured engagement between the Project and Kempsey and Armidale Council and community representatives.

ii First Nations

Consultation has also been carried out with the Project's Registered Aboriginal Parties (RAPs) throughout the response to submissions phase of the Project regarding the Addendum to the Aboriginal Cultural Heritage Assessment (ACHA) (EMM 2024). Due to the time that had lapsed since previous engagement with RAPs for the EIS, the consultation process was re-started ensuring all interested parties were able to register their interests in the Project and have the opportunity to be involved in the response to submissions process.

Separate to the consultation requirements for the purposes of the ACHA, GIRA Advisory (a First Nations owned and operated business) has been engaged since the exhibition of the EIS as a First Nations advisor to the Project to assist with development of specific programs and cultural benefits, such as Aboriginal Ranger program, Heal Country initiatives and health, housing and accommodation services. Through on-site engagement and focused discussions with primary stakeholders, GIRA has supported the ACHA process (which is focussed on the prescribed process for that assessment). At the same time, GIRA has undertaken a broader First Nations consultation process to enable community engagement and participation with the Project. Since September 2023, this has included:

- 414 hours working within the community (on Country).
- 28 meetings with Project leads and First Nations primary stakeholders.
- 1139 interactions with Project leads and Frist Nations primary stakeholders.

3.2.3 Government agency consultation

Consultation with government agencies has also been ongoing since the public exhibition of the EIS. Key agency consultation is summarised in Table 3.2. Engagement carried out specifically on agency submissions is responded to in Chapter 4.

Table 3.2 Summary of government agency consultation

Stakeholder	Consultation method	Key matters discussed
DCCEEW [Commonwealth]	Meeting (online); email.	Project update; amendment of the controlled action to align with the amended project.
DCCEEW Water	Meeting (online); email/letter.	Project update; water licensing.
BCSD	Meeting (online); email/letter.	Project update; anticipated responses to key issues raised.
NPWS	Meetings (in-person and online); emails.	Ongoing groundwater monitoring; initial mobilisation and access via Carrai; NPWS road works.
DPHI	Meetings (online); phone calls; emails.	Project update; key issues raised in submissions; project amendments; engagement with other agencies.
TfNSW	Meetings (in-person and online); emails; phone calls.	Upgrade of Kempsey Armidale Road and integrated approach with Council delivery; information availability; design and schedule.
RFS	Meetings (online); phone calls; emails.	Emergency access and egress/movement and evacuation of workers during bushfire; planning for site visit.
Kempsey Shire Council	Meetings (in-person and online); phone calls; emails.	Project updates; Kempsey Armidale road works; community benefits; funding agreements (VPA).
Armidale Regional Council	Meetings (in-person and online); phone calls; emails.	Project updates; Kempsey Armidale road works; community benefits; funding agreements (VPA).

3.3 Further technical assessments and investigation

A key issue raised throughout the submissions period and in consultation with key government agencies was the design and assessment of permanent spoil emplacement (PSE) areas. Further investigation has been completed by WSP (WSP, 2024) to present a conceptual landform design and an accompanying report that responds to the key issues raised (Appendix D). This basis of design has then been assessed by relevant technical specialists.

New or revised and/or additional technical assessments have been completed in response to feedback received during the submissions period as well as to address Project amendments since public exhibition of the EIS, including the updated conceptual design for PSEs.

New or revised assessments completed for this Submissions Report include:

- Surface Water Assessment (SWA) report, which includes a Flood Study and Discharge Impact Assessment (Appendix E)
- Groundwater Impact Assessment (GIA) (Appendix F)
- Geochemistry Assessment (Appendix G)
- Climate Change Risk Assessment (CCRA) (Appendix H).

Other updated reports and technical addendum assessments have been prepared for many other key issues including biodiversity, Aboriginal heritage, social, traffic, noise, air quality, aquatic ecology, and bushfire, and they address the key refinements to the Project since exhibition. As mentioned in Section 3.1, these may be discussed in this report in relation to the submissions received. However, the technical assessments of the amendments are all provided in the Amendment Report.

4 Response to local council submissions

4.1 Armidale Regional Council

Armidale Regional Council (ARC) raised several issues in its submission on the Project, including traffic and transport, bush fire risk, other hazards, waste, world and national heritage values, water, biodiversity, soils and social and economic impacts and community benefit. The submission and our responses have been considered and summarised in Table 4.1 and lists where these have been addressed in the Submissions Report and supporting studies.

Table 4.1 Response to issues raised by Armidale Regional Council

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
ARC01	The project requires the Kempsey Armidale Road to be upgraded to make it suitable for the construction and operation of the project. The EIS therefore needs to outline the scope of the roadworks required and the impacts of the required road works. Whilst the road works may be carried out by a third party, the works are integral to the project and cannot be excluded from the project.	The proponent has been in discussions with ARC to establish a Memorandum of Understanding (MoU)/Heads of Agreement (HoA) that will outline how the proposed upgrade works required by the Project will be integrated with the proposed works for the Kempsey Armidale Road Recovery Program (KARRP). The works required for the Kempsey Armidale Road (KAR) linked to the Project would be funded by OMPS Pty Ltd but with ARC being the proponent for their approval within the ARC LGA (and Kempsey Shire Council being the proponent for works within their LGA). This MoU/HoA will ensure that there is alignment between ARC and the proponent on a suitable approvals pathway, timeline for delivery, and determining the project's funding/contribution to the proposed upgrade works and maintenance. The HoA with Kempsey Shire Council has been signed. On 11 July 2024, Council confirmed it would be requesting delegated authority from Council to the General Manager to progress the HoA when Council goes into caretaker mode in August 2024 prior to Council elections in September. As such, discussions regarding detailed design of proposed works for KAR and their assessment and approval are ongoing.	Section 4.1.1i
ARC02	The EIS states that the project will be commenced in mid-2024 and will require the road upgrade works to be carried out at the same time as the Kempsey–Armidale Road Restoration Project (KARRP). In this regard negotiations with ARC, separate to this application, will be required in order to manage road construction possession matters. The contractual agreements for the road works are not a matter for consideration as part of this SSI application. From a project perspective, ARC will not be carrying out or funding any road upgrade works required by the project, and therefore any road upgrades necessitated by the project will remain the responsibility of the proponent. The project should be revised to incorporate the required road upgrade works.		
ARC03	ARC will not accept any new roads or other infrastructure outside of the existing ARC road reserves. Nor will ARC accept the transfer of any Crown roads. The exception to this would be if road widening was required on the existing Kempsey–Armidale Road to facilitate any upgrades.		
ARC04	ARC has previously advised the proponent that the road has significant geometry and structural capacity constraints. This has also been exaggerated by higher than usual volumes of traffic on the road relating to civil activities. This risk is likely to grow proportionately based on the volume of vehicles on the road. The upgrade works will be significant in order to provide a suitable road to support the development. The scope of the road upgrade works needs to be clearly ascertained and impacts assessed as part of this project. The EIS should be amended to address this. ARC will not accept a requirement for a separate approval process for the road upgrades required by this project.		

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
ARC05	The traffic assessment included with the EIS provides scant consideration of the traffic impact on the roads with the Armidale Regional LGA. Instead, the reporting suggests that most traffic will travel east to Kempsey Shire LGA. Elsewhere, however, there is quite a reliance on access to the Armidale LGA including for early construction accommodation, access to services, access to the waste facility, amongst other things. The traffic assessment should be reviewed to ensure it provides an accurate assessment of project traffic generation and direction of travel.	An updated traffic report has been prepared in that incorporates the proposed amendments to the Project. That report is provided with the Amendment Report and provides the correct traffic distribution from Kempsey and Armidale regions for the worst-case scenario. However, this report also contains responses to specific submissions.	Section 4.1.1ii
ARC06	The maintenance of the Kempsey Armidale Road during construction activities should be the responsibility of the proponent, within reason. The extents of the required maintenance will be subject to ongoing monitoring of the road condition and separate negotiations with ARC.	As noted above, the proponent has been in discussions with ARC since the EIS exhibition, and this submission, to establish a Memorandum of Understanding (MoU)/Heads of Agreement (HoA).	Section 4.1.1i
ARC07	Supporting the maintenance of the road will be periodic dilapidation reports extending from the Armidale Regional Council LGA boundary in the East to the Intersection of the Waterfall Way in the West conducted at reasonable intervals including milestones such as but not limited to prior to works commencement change in activity delivery and at any other appropriate milestone including prior to and post oversize and over mass movements.		
ARC08	The Bushfire Assessment provided with the EIS has not adequately considered the increased bushfire risk posed by the project, and in particular during construction, with the accommodation of some 600 construction workers on site. The subject site is in a very isolated location, with access via narrow and winding roads located in vegetation with a high hazard and exceptionally steep slopes. The logistics of evacuating such a large transient population is problematic and has not been adequately considered in terms practicability. The tenability of a refuge building and ongoing servicing needs (alternate power, air within the building, water supply, amenities, food, etc.) to be realistically considered to ensure its achievable, considering the length of isolation times given the remote location.	The Bushfire Assessment was completed with reference to Planning for Bushfire Protection (RFS) and demonstrated the Project can meet the minimum requirements and where feasible, exceed these requirements. Prior to and following exhibition of the EIS, the proponent has been in discussions with RFS regarding the remoteness of the site and the proposed emergency management approach.	Section 4.1.2 and Appendix C
ARC09	The project will increase the likelihood of ignitions by virtue of the new uses, increased population and additional vehicle and machinery use. Consequence will also increase due to the additional population being located on site and the increased investment on site. Thus, overall bushfire risk will increase.	The Project will have a range of potential ignition sources and unless mitigated, these sources could generate bushfires in adjoining vegetation or structures. Unmitigated, the overall bushfire risk will increase. As such, the design has incorporated a range of mitigation measures and further measures will be implemented to prevent ignition as well as manage bushfire risks and its management.	Section 4.1.2 and Appendix C

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
ARC10	The project will, as a result of the above, place an increased demand on local fire services. Additional funding should be provided to the local emergency services to offset the additional demand created by the project.	It is intended that bushfire risk can be managed through the projects design and standard operating procedures during construction and operation, as well as the additional management measures recommended by the Bushfire Assessment completed for the EIS.	Section 4.1.2 and Appendix C
ARC11	The subject site is located within a very steep environment with areas of very high/extremely high erosions risks as outlined in Appendix P of the EIS. No consideration has been given to Landslip as a hazard in the EIS. The impact of the development on landslip and landslip on the development needs to be considered.	A review of site stability was included in the EIS with reference to geotechnical hazards, including evidence of rockfalls, minor landslide on lower slopes with steep inclination (25–30 degrees), and a reduction in soil stability is identified as a potential impact. Mitigation measures have been identified to minimise erosion risks and risks to landform stability. As part of Project amendments, a revised spoil design has been prepared including key design principles to guide the detailed design and ensure long term stability of landforms. This is provided in the Amendment Report.	N/A
ARC12	The EIS identifies that Council's Armidale Waste Management Facility (AWMF) will be utilised as the primary disposal facility for the project. No consultation with ARC has occurred in relation to the use of the AWMF. Whilst the AWMF is new and has significant capacity, it has been designed to accommodate the demand from the local government area (LGA). Major projects such as the proposed project should not unreasonably burden the local community in terms of a loss of capacity and thus design life of the AWMF without reasonably compensating ARC for the real costs for the loss of capacity associated with the project.	Discussions with ARC have been ongoing with regard to funding agreements for community benefits (VPA). It is the view of the proponent that the VPA will provide for waste impacts if they occur. This would be appropriate in view of the EP&A Regulation and the *Draft Benefit Sharing Guideline. Guidance for state significant renewable energy development* (DPIE, 2023). As noted above, the VPA is currently under discussion with ARC alongside the HoA.	N/A
ARC13	The impacts on the World and National Heritage Values within the EIS have not included the impacts resulting from dust generation.	The EIS included a World and National Heritage Impact Assessment. This considered the findings of the air quality impact assessment, including dust generation impacts.	N/A
ARC14	The EIS has not provided any details on where the potable water will be supplied from during the construction period, and the impacts thereof.	Potable water will be trucked in to fly camps during early stages of construction after which it will be sourced from the Macleay River and treated prior to consumption.	Section 4.1.3 and Appendix E (updated SWA, Section 5.5.2i)
ARC15	The EIS has not provided any details on where the potable water will be supplied from during operation of the project, and the impacts thereof.	Potable water will be sourced from the Project reservoirs and treated prior to consumption during operations.	Section 4.1.3 and Appendix E (updated SWA, Section 5.5.7)

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
ARC16	The EIS states that the project will "offer valuable seasonal storage and insurance against drought risk" (p.32). Further clarification is required as to how this will be achievable whilst the plant is continuing to operate.	The inclusion of drought reserve within reservoir(s) will be investigated during detailed design. A drought reserve would allow continued pumped hydro generation during times when operational top-ops are limited due to drought.	Section 4.1.3 and Appendix E (SWA)
ARC17	The project requires upgrades to the Armidale Kempsey Road in order to provide suitable access. The EIS has not considered the impacts of the required road upgrades, including the biodiversity impacts. The road upgrades are a precondition for the project to operate. It would be inappropriate to determine this application in the absence of certainty that the required road upgrades can occur and can occur with an acceptable level of impact on biodiversity.	The proponent has been in discussions with ARC to establish a MoU/ HoA that will outline how the proposed upgrade works required by the project will be integrated with the proposed works for the KARRP. This MoU/HoA will ensure that there is alignment between ARC and the proponent on a suitable approvals pathway, timeline for delivery, and determining the Project's funding/contribution to the proposed upgrade works and maintenance. As noted above, discussions regarding design of proposed works are ongoing.	Section 4.1.1i
ARC18	The EIS identifies that much of the site has poor soil quality and that limited good quality soil exists on site suitable for rehabilitation uses. Clarification is required as to whether soil will need to be imported to ensure rehabilitation can occur as planned. Furthermore, any additional traffic generated by the importation of soil needs to be considered in the Traffic Impact Assessment.	It is not intended to import large quantities of soil to the site. A Soil Stripping and Management Plan is intended to ensure preservation of onsite and excavated soil resources, including quantity and quality, such that they can be used in site rehabilitation. The need for any import of additional material will be determined during detailed design following completion of geotechnical investigations.	N/A
ARC19	The EIS identifies that an accommodation camp accommodating approximately 600 persons will be established on the subject site. Prior to the establishment of this camp, accommodation would be required for the construction workforce. Further information is required on the scale of the likely demand for accommodation prior the establishment of the accommodation camp and the likely timing of the construction of the accommodation camp in relation to the commencement of the project construction.	Additional information on the scale of likely demand and likely timing of accommodation camp has been considered and provided in this Submissions Report. There is also an addendum to the SIA provided with the Amendment Report that assesses the proposed project amendments.	Section 4.1.4

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
ARC20	A “workforce housing and accommodation strategy” is to be developed to address the housing of the workforce prior to the completion of the camp. Further the Social Impact Assessment (SIA) indicates that tourist accommodation will be affected by workers on the project. Further information is required on the likely demand for accommodation for workers and the availability of supply considering ordinary demand within the local areas. It needs to be demonstrated that local tourism (including business, sporting and cultural events) will not be adversely affected by the non-availability of accommodation as a result of the demand from workers accommodation including cumulative impacts.	Further analysis has been undertaken as part of the SIA Amendment Report. This identifies a period of 4 months where there is a deficit of site based construction accommodation. While a full Workforce Management and Accommodation Strategy will be completed by the D&C contractor, the SIA Amendment Reports pinpoints the 4 months of deficit and provides strategic actions to reduce – or even remove entirely – the pressure on local accommodation for non-local workers.	Section 4.1.4
ARC21	The EIS has not considered the impact on medical services or other general services. It states that “It is proposed that the Project consult with NSW Health to confirm capacity of existing service provision and implement measures such as provision of on-site medical facilities to prevent competition for the GP services most proximal to the site.” Further information is required to demonstrate realistically and practically how the project workforce will not adversely impact access for permanent local residents to medical and other social services.	Further information on Project health services and potential impacts have been considered within this Submissions Report.	Section 4.1.5
ARC22	The EIS states “OMPS proposes to work in partnership with the Armidale Regional and Kempsey Shire councils and the local community so that, as far as possible, the benefits of the projected economic growth in the region are maximised and impacts minimised wherever possible. This can be achieved through the implementation of a variety of mitigation measures for economic impacts.” (p.304). The proponent has engaged in scant dialogue with ARC to date and consequentially ARC cannot hold any trust in such vague/sweeping comments. The impact assessment is therefore required to include a robust consideration of economic impacts and provision of tangible, measurable and enforceable mitigation measures to offset the impacts.	Since exhibition of the EIS, the proponent (OMPS Pty Ltd) was acquired by Alinta Energy. As owner of OMPS Pty Ltd, engagement with ARC has recommenced and is ongoing. Economic and community benefits are being discussed with both ARC and KSC and will form part of a VPA to be executed. The Project aligns to the LSPS (2024) as it will contribute to the goal of the New England region being a carbon positive community and entering into a planning agreement with ARC to contribute its community benefit funds.	Section 4.1.6
ARC23	The EIS states “The Project will support Armidale Regional Council’s planning actions and goals, by contributing to the local economy, renewable energy/electricity, as well as by delivering new infrastructure (roads and transmission lines) and new industries and jobs”. (p. 19). These comments are based on ARC’s old Local Strategic Planning Statement (LSPS). The proponent has not engaged with ARC in relation to its current strategic planning and has consequentially not address the draft LSPS. Further consultation is therefore required with ARC in this regard.		

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
ARC24 and ARC25	Council's *Renewable Energy Community Benefit Framework* (Framework) which has been subject to community consultation requires that state significant and regionally significant renewable energy projects in the Armidale Regional Council Local Government Area. The proponent has not entered into meaningful negotiations with ARC to ensure that the off-site benefits of the project are delivered. The EIS makes vague references to entering into a planning agreement, however, the proponent has been disengaged for over 3 months on progressing the general terms of a planning agreement.	Since exhibition of the EIS, the proponent (OMPS Pty Ltd) was acquired by Alinta Energy. As owner of OMPS Pty Ltd, engagement with ARC has recommenced and is ongoing. Economic and community benefits are being discussed with both ARC and KSC and will form part of a VPA to be executed.	Section 4.1.6
ARC26	The project does not ensure that the wider community (Armidale Region) will share in the benefits of the project.	Regional benefits have been identified however these cannot be realised without the Project proceeding. Should the Project be approved, management and procurement plans will need to be developed and ensure local content can be secured and therefore provide these regional benefits. The proponent is in the process of undertaking community benefit workshops to support the development and application of the VPA. These have already been undertaken in Kempsey Shire Council in June 2024. The updated evaluation and justification for the Project, including why it is within the public interest has been included in the Submissions Report.	Section 4.1.6 and Chapter 7
ARC27	The project does not provide for community (Armidale Region) benefits to be shared inter-generationally.		
ARC28	Consequently the project is not considered to be in the public interest.		

4.1.1 Roads and traffic

i Kempsey Armidale Road (ARC01-04; ARC06-07)

Both Councils are currently undertaking recovery works along the KAR after the severe weather and flooding events in 2022 with government funding provided under Disaster Recovery Funding (DRF). That funding is specifically for those works to re-establish the road to their pre-disaster state. They are not to be used for any other road upgrade works.

Further, timing would be a potential issue, given that the road is currently closed for safety and construction works in some locations. There is the potential for the DRF works to be undertaken, and then, if further works are required in the same locations for the Project, that the recently completed works would then have to be removed in order for the upgrade works to be completed. This would result in inefficiencies, and extended times (and associated impacts to the community) of road closures.

As such, it is important that works associated with the Project do not interfere with the funding for those works, nor the timing of them.

The proponent has participated in meetings and workshops with both the Armidale Region Council (ARC) and the Kempsey Shire Council (KSC) to work through how best to integrate the road works for the Project with each of the Councils DRF scope of works. The aim of these workshops has been to identify the 'delta' between the works planned to be undertaken under the DRF and works required for the Project. That delta would then form the basis of planned funding, works and their schedule to be agreed in a Memorandum of Understanding (MoU), supported initially by a Heads of Agreement (HoA).

The approvals, and the works, would then by undertaken by Council, funded by OMPS Pty Ltd. Since the approval for the works would be undertaken by the councils, KAR works is not considered further in the EIS and Amendment Report. Further information on ancillary elements and related development is provided in Section 6.3.3 of this Submissions Report.

The HoA with Kempsey Shire Council has been signed. The HoA with Armidale Regional Council is in discussion. This is being facilitated by ARC's request for delegated authority from Council to the General Manager to progress the HoA when the Council enters caretaker mode in August before Council elections in September 2024.

ii Traffic assessment (ARC05)

Construction traffic for all the construction activities will generally be from the Kempsey directions with **tr**affic from Armidale only occurring during the first twelve months for construction of the western temporary access (including a bridge over the Macleay River).

After the first 12 months, all construction traffic will come from Kempsey, with the exception of sporadic and low level use by small vehicles from Armidale. Construction vehicular trip distribution for each site access is summarised below:

- **Site Access 1** – EAR (near Smiths Bluff): to and from Kempsey – all OSOM vehicles, light and heavy vehicle construction related traffic travelling to and from Kempsey.
- **Site Access 2** (transmission access road, located west of Lower Creek): for the construction of the transmission corridor:
  - Heavy vehicles: all heavy vehicles to/from Kempsey via the KAR.
  - Light vehicles: all light vehicles from Kempsey via the KAR.
- **Site Access 3** (transmission access road, north of Georges Junction): for construction of the transmission corridor:
  - Heavy vehicles: all heavy vehicles to/from Kempsey via the KAR, EAR and western access bridge (Site access 4).
  - Light vehicles: all light vehicles to/from Kempsey, via the KAR, EAR and western access bridge (Site access 4).
- **Site Access 4** (temporary bridge at George's Junction): to be used up to 12 months for mobilisation:
  - Heavy vehicles: 100% of the heavy vehicles to/from Armidale.
  - Light vehicles: 100% of the light vehicles for the mobilisation of internal roads and bridges.
  - All vehicles will come from Kempsey once the EAR has been constructed.

- **Site access 5** (emergency access road, via Carrai): in addition to emergency egress from the upper reservoir site, this access to also be used for initial construction access mobilisation to the Upper Dam Access Road worksites

    - Will be completed within the first 18 months of construction with peak traffic occurring in the first 2 months.

    - This access is expected to have only minor construction related traffic, a maximum of 1–2 vehicles per day, travelling from Kempsey (via Toorooka Road/KAR intersection) to the upper dam worksite areas.

The above trip distribution configuration shows that the maximum traffic generation will occur at the Site Access 1 – EAR and the lowest traffic generation will occur at the Site Access 3 – Transmission Line.

Full assessment of these traffic movements at all site accesses is provided in the updated TIA which is provided with the Amendment Report.

4.1.2 Bushfire risk (ARC08-10)

The Bushfire Assessment was completed with reference to Planning for Bushfire Protection (RFS) and demonstrated the Project can meet the minimum requirements and where feasible, exceed these requirements.

The Project will have a range of potential ignition sources and unless mitigated, these sources could generate bushfires in adjoining vegetation or structures. Unmitigated, the overall bushfire risk will increase. As such, the design has incorporated a range of mitigation measures and further measures will be implemented to prevent ignition as well as manage bushfire risks and its management.

It is intended that bushfire risk can be managed through the Projects design and standard operating procedures during construction and operation, as well as the additional management measures recommended by the Bushfire Assessment completed for the EIS. Onsite firefighting management measures will be in place, therefore not necessarily increasing demand for firefighting services. However, ongoing engagement with RFS will be important for Project planning.

Prior to and following exhibition of the EIS, the proponent has been in discussions with RFS regarding the remoteness of the site and the proposed emergency management approach. These discussions will be ongoing as the Project progresses.

4.1.3 Water resources (ARC14-16)

i Water supply

A water supply system is proposed to supply water for potable water use, general construction water demand and for the initial fill of Project reservoirs. Elements of the water supply system will be retained during operation of the Project.

During construction, potable water for the fly camps will be trucked in from an external source. Potable water for the main accommodation camp and construction facilities will be sourced from the Macleay River via pump and pipeline. Water sourced from the Macleay River will be treated to a potable water standard before use.

During operation, raw water will be supplied for firefighting at the power station complex, access tunnels and portals. Water will be sourced from the reservoirs for ongoing operational water supply which is anticipated to be relatively minor compared to the volume stored in the reservoirs. A water treatment plant will be used to treat raw water from the reservoirs for supply potable water for use on site during operation, such as at the office building.

The water balance completed for the Project and its impacts are presented in detail in the Surface Water Assessment (Appendix E).

ii Seasonal storage

The pumped hydro system must contain a minimum of about 5,800 ML of available water within the upper and lower dams and reservoirs to operate at full generation capacity. This includes allowance of dead storage and drought reserve which is intended to provide additional security of supply during dry periods when operational top-up from the Macleay River would not be possible (due to the proposed cease to pump rules).

Suitable drought reserve allows continued pumped hydro generation during times when operational top-ups are limited due to drought. While a nominal inclusion of drought reserve has been modelled as part of the SWA (Appendix E), the preferred volume of drought reserve within the reservoirs will be further optimised during detailed design.

4.1.4 Workforce and impact on housing and short term accommodation (ARC19-20)

The Project includes a main accommodation camp as well as the addition of three fly camps to be located:

- near the Eastern Access Temporary Bridge near Smith's Bluff (Eastern fly camp)
- near the intersection of the Main Access Road and the EAR (Western fly camp)
- the upper reservoir (Southern fly camp).

Each temporary fly camp will have a room capacity for between 20 and 90 workers. The main accommodation camp will have a capacity for 600 workers. The main accommodation camp will be established progressively. Table 4.2 provides the estimated timeframe for the availability of on-site accommodation for use by construction workers.

Table 4.2 Accommodation camp capacity and availability

Camp	Capacity	Indicative availability
Eastern fly camp	40 to 70 workers	Q3 2025–Q4 2026.
Western fly camp	50 to 90 workers	Q3 2025–Q2 2027.
Southern fly camp	20 workers	Q3 2025–Q2 2027.
Main accommodation camp	600 workers	Q3 2026 – 100 worker capacity per month added each month until completion in Q4 2026. Demobilisation in Q4 2031.

The schedule for the establishment of workforce accommodation shows the three 'fly' or temporary camps being established from Q3, 2025. It is assumed that only FIFO workers and workers living more than 100 km away will require on site accommodation until the establishment of the main accommodation camp from Q3, 2025. Based on these assumptions, there will be 11 non-local workers in June 2026 who will require accommodation. Workers living less than 100 km away or locally (within Kempsey and Armidale LGAs) will reside at their home residence or seek short-term accommodation nearby until Q4 2026.

From Q3, 2025, once the main camp has capacity for 100 workers available, there will be sufficient accommodation for FIFO workers, workers living more than 100 km from site and workers living less than 100 km from site. Local workers (residing within Kempsey and Armidale LGAs) will be required to commute to site for their home residence until Q4 2026, when capacity becomes available at the main camp. Assuming all workers are accommodated onsite, from Q3, 2027 once the remaining fly camps are removed, a shortfall of accommodation will occur again.

While local accommodation will be required, for flexibility, even when all the planned accommodation on site is in operation, this arrangement will significantly reduce the demand for short-term accommodation by the Project.

The availability of rental and short-term accommodation in the local and regional area is highly constrained, with low vacancy rates, high levels of housing stress and limited short-term accommodation. Updated social baseline data demonstrates the availability of rental accommodation in the local and regional area, within commutable distance from the Project site. The updated analysis confirms no change in the vacancy rate for Kempsey LGA rental accommodation and a small increase in the vacancy rate for Armidale LGA rental accommodation from 1.1% in September 2022 to 1.7% in April 2024. This results in approximately 211 rooms being available within the two LGAs as at April 2024.

The majority of the short-term accommodation in the local area primarily caters to the needs of tourists and visitors, including camp sites and cabins. Regional occupancy data shows the availability of tourist accommodation (hotels and serviced apartments) in the New England North West region to be 38.9% in the December 2023 quarter (Destination NSW, 2023).

Updated modelling of accommodation demand for Project construction confirms the Project can accommodate all non-local workers with the exception of 4 months in 2025/2026. This shows a deficit of 30, 48, 172 and 57 worker capacity respectively over those 4 months. This will be prior to the establishment of the main accommodation camp. Recommendations to form the basis of a Workforce Management and Accommodation Strategy by the D&C contractor include consideration of the following possibilities that would reduce or even remove the deficit altogether for non-local workers:

- Commence construction of the main accommodation camp 4 months sooner than currently scheduled.
- Increase the capacity of the main accommodation camp which would also allow additional space for local workers who may look for accommodation closer to the site.
- Retain the fly camps longer than currently scheduled.
- Increase the short term capacity of the fly camps for the critical 4 month period.

The Project will also liaise with social service providers and tourism bodies, to build an understanding of crisis and tourism accommodation requirements in the surrounding localities for local workers (30% of the total workforce) a proportion of whom may seek accommodation closer to the site.

i Feasibility of requirement for workers to reside at an accommodation camp

Residential labour mobility is “where people in the labour force relocate their usual residence to another regional labour market” (Productivity Commission 2014). The Productivity Commission Research Report on Geographic Labour Mobility (2014) estimated that annually just under 10% of people will be prepared to relocate for employment reasons. However, it was noted that the construction industry was one of the most mobile labour forces.

If 10% of the peak non-local construction workforce (70%) move to the regional area, this would result in 58 workers seeking housing.

It is noted that local workers and some workers where their home residence is located less than 100 km from the Project site will reside in their own private accommodation and travel to the Project site on a daily basis. Workers who reside at the accommodation camp will originate from more than 100 km from the Project site and from other regions, on a FIFO arrangement. Shift rotations on similar projects are typically 10/4, or 10 days on, four days off. FIFO workers will have return flights to their place of residence after each shift rotation, included in their compensation package. Shift rotations will be determined by the construction contractor.

The Project will provide incentives for workers to live at the Project accommodation camps. These incentives include accommodation being provided free for construction workers as part of the salary package. Average asking weekly rents for Kempsey by postcode were $490 for houses and $400 for units while average weekly rents in Armidale were $451 and $303 for houses and units, respectively (SQM Research, 2024). Renters are also required to pay electricity and water usage, and transportation to site would also be required. As such, complementary accommodation is considered a significant financial incentive.

The provision of services includes onsite medical and recreational facilities such as a gym and other sporting facilities, and social events.

ii Impact on tourism accommodation

The majority of tourist accommodation and services are located in Armidale township and within the broader Kempsey LGA. Supply of short-term accommodation in the local and regional area is largely taken up by the tourism industry. In 2020/21 Kempsey LGA received 1,600,145 domestic overnight visitors. Within the same period Armidale LGA received 914,912 domestic visitors. In the last five years to 2020/21 there were an average of 7,976 visitors and 8,364 visitors from overseas visiting Kempsey LGA and Armidale LGA respectively. This generated $69.2 million in tourism sales and added $36.8 million to the Kempsey economy. For Armidale, the totals were also significant: $109.7 million in tourism sales and a total of $60.5 million value add.

It is noted that there a number of regional events in Armidale that attract a range of tourists and visitors. More than 4,000 people attended the annual The Big Chill family music event at Dumaresq Dam in May 2024 (Armidale Regional Council, 2024). It is estimated that The Big Chill event generated $2.3 million in the local economy including $1.4 million of visitor expenditure. According to Regional Development Australia Northern Inland NSW, the event attracted 1,140 visitors, most of whom stayed for two nights and attended the festival on both days (ibid, 2024).

In addition, sporting events such as Gymnastics NSW Country Championships are held each July in Armidale where more than 40 clubs and 1,000 athletes compete at the Winter Invitational. Agricultural shows are held each year in numerous towns including Glen Innes, Walcha and Uralla. The Guyra TroutFest is also held each October. It is noted that there are no advertised recurring events in the local area.

The majority of short-term accommodation in the local area primarily caters to the needs of tourists and visitors, including camp sites and cabins. Regional occupancy data shows the availability of tourist accommodation (hotels and serviced apartments) in the New England North West region to be 38.9% in the December 2023 quarter (Destination NSW, 2023). NPWS estimated the occupancy of campgrounds in the local area would be 50% occupancy for a bad year and 70% occupancy for a ‘good year’ (NPW, pers comm).

In November 2022 there were a total of 20 short stay tourist accommodation options in the local area. These include five campgrounds, three cottages, three retreat style accommodation, four cabins, one hotel and four homesteads including East Kunderang Homestead. Two accommodation businesses within the local area advertised the imminent opening of their establishment to the public. It is estimated the total short-term accommodation available in the local area is 51 rooms (excluding camp sites).

As noted above, based on the updated accommodation model, there will be a shortfall of 11 FIFO workers and workers living more than 100 km from site who will require accommodation in June 2026. The shortfall will occur in the winter period, when demand for accommodation from tourists and visitors is at its lowest point of the year. While local accommodation will be required during construction for flexibility, even when all the planned accommodation on site is in operation, the proposed accommodation arrangement will significantly reduce the demand for tourism accommodation by the Project.

iii Cumulative impacts on short-term accommodation

Most of the developments, where overlap with construction phases is likely, are located towards the Armidale (west) side of the Project. The cumulative impact assessment in the SIA report (EMM 2023) noted that peak construction phase for the majority of the 19 identified projects to be 2024 and 2025 with an additional workforce of 620 personnel in 2026 and 520 personnel in 2027 from other projects. The cumulative impact assessment will be updated in the SIA Amendment Report.

4.1.5 Access to health services (ARC21)

Two agency submissions were received with regard to the impact of Project demand on health services on the accessibility of health services for local residents. Section 4.1.4iii above notes the number and timing of construction workers who will be working at the Project site. It is noted that there are no GP services in the local area. A total of 16 GP practices were identified in key urban areas, with 10 located in Armidale and 6 located in Kempsey. There are three hospitals located within the key urban areas. Two hospitals are located in Armidale city (with 99 beds and 30 beds, respectively), and one hospital is located in Kempsey township (with 81 beds). These hospital facilities are a maximum 1.5 hour drive from local communities.

It is estimated that 30% of workers, or 247 personnel, will be recruited locally, from within the regional area (Armidale LGA and Kempsey LGA). Prior to commencing work, local workers will complete their pre-employment medical checks in their home towns. Some of these workers may originate from Armidale and Kempsey.

The Project will liaise with local GPs to provide early notice of pre-employment medical checks required for local workers for planning purposes. During the construction phase, a first aid room and first aid kits with appropriate types and quantities of medical supplies will be provided on site. The Project will provide a dedicated nurse for routine medical requirements and to respond to incidents on site.

4.1.6 Distribution of community benefits (ARC22-28)

Although the Project falls within Armidale Regional Council LGA, the majority of impacts from the Project will affect the Kempsey Shire Council LGA. As such, the Proponent is seeking to develop a Voluntary Planning Agreement/ community benefit sharing process that is beneficial to both Kempsey and Armidale Council with financial contributions to be split between the two LGAs proportionate to the Project impacts. The basis for this process is prescribed by several legislative and guidance documents, including:

- Section 7.4 of the EP&A Act which notes that planning agreements should be used for a public purpose, with a public purpose including the provision (or recoupment of cost of providing):
    - public amenities or public services
    - affordable housing
    - transport or other infrastructure relating to land
    - funding of recurrent expenditure relating to the provision of public amenities or public services, affordable housing or transport or other infrastructure

- monitoring of the planning impacts of development
- conservation or enhancement of the natural environment.

- *Draft Benefit Sharing Guideline. Guidance for state significant renewable energy development* (DPIE, November 2023).
- Armidale Regional Council's *Renewable Energy Community Benefit Framework* which states the minimum community benefit threshold is $850 per megawatt of capacity for energy storage developments (including pumped hydro). The funds are to be used to:
  - "secure off-site benefits for the community so that renewable energy development delivers a future sustainable net community benefit"
  - "ensure that the wider community share in the benefits resulting from renewable energy development in the LGA"
  - "ensure that the costs and benefits of renewable energy development will be equitably distributed within the community and inter-generationally"
  - "ensure that community benefit outcomes are determined through appropriate governance processes which include REZ community representation".

In accordance with the DPIE *Draft Benefit Sharing Guideline* the proponent hosted a community benefits sharing workshop with members of the Kempsey and Upper Macleay River communities with the aim of understanding ways in which the Project could share benefits with their local community. More than 50 ideas on benefit sharing initiatives were presented by the community during the workshop. These initiatives will shape the Project VPA with Kempsey Shire Council to ensure funding is allocated to works that reflect the needs and concerns of the community.

The proponent will enter into VPAs with the Kempsey Shire Council and Armidale Regional Council. The HoA with Kempsey Shire Council is signed. It is the Proponents intention to enter into an HoA with ARC also, for which negotiations are ongoing.

4.2 Kempsey Shire Council

Kempsey Shire Council (KSC) raised several issues in its submission on the Project, including water, transport, social and economic impacts and geotechnical hazards. The submission and our responses have been considered and summarised in Table 4.3 and lists where these have been addressed in the Submissions Report and supporting studies.

Table 4.3 Response to issues raised by Kempsey Shire Council

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
Water			
KSC01	**Water extraction** The EIS and Appendix M identifies extraction for the initial storage fill and operational top-up will occur at a rate of up to 86.4 megalitres per day (ML/day), which results in a maximum streamflow reduction of 12.6% for short periods (several hours). This is equivalent to an approximate 5% reduction in streamflow depth at the extraction point. However, the documents fail to clearly articulate the need to minimise impact on the source and receiving waters i.e. Macleay River. Will a staged approach occur during extraction to mimic the natural catchment runoff and flow events occurring within the Macleay Catchment?	An updated SWA provides details on the proposed extraction regime for the initial storage fill and operational top-up. Several measures are proposed to protect natural streamflow regimes.	Appendix E (SWA, Chapter 7)
KSC02	**Water extraction** The initial storage fill is a one-off take and will occur for a relatively short period of time (i.e. 3-12 months). KSC requires further information on how and when this would occur, to ensure no adverse impacts on downstream users.	An updated SWA provides details on the proposed extraction regime for the initial storage fill.	Appendix E (SWA, Section 5.5.5)
KSC03	**Water extraction** KSC noted The Water Sharing Plan for the Macleay River Unregulated and Alluvial Water Sources outlines that no new access licenses can be granted. Any new commercial development must purchase entitlement from existing access licences. KSC would like additional information on whether there are adequate entitlements available from existing access licences to accommodate the proposed development.	SWA updated to provide additional details on the available water access licences that could be traded to account for operational water take.	Appendix E (SWA, Section 10.8)
KSC04	**Water discharge** KSC understands the project may be able to release water to assist with river flow in low flow times. However, the EIS does not clearly articulate how effective this will be in maintaining river flow to: a) Maintain environmental flow for the overall health of the river system. b) Assist in recharging Council's key bore fields at Sherwood, downstream from the project, which supply the Kempsey Lower Macleay Water Supply area.	A drought reserve would allow continued pumped hydro generation during times when operational top-ups are limited due to drought. However, downstream releases would depend on the volume of water available. The preferred volume of drought reserve within the reservoir(s) will be investigated during detailed design.	Section 4.2.1
KSC05	**Water discharge** Will the OMPS project work and operation release unknown levels of heavy metals? This has not been adequately addressed in the EIS.	An updated SWA provides further details on potential water quality impacts associated with the Project.	Section 4.2.1 and Appendix E (SWA, Section 6.6, 7.4 and 7.6)
KSC06	**Water discharge** Consideration of the OMPS projects impact on suspended solids, and other water quality criteria as relevant, during construction and the operational phase is required given the implications for Council's water supply receiving locations which are impacted adversely by turbidity in river flow.	An updated SWA provides further details on potential water quality impacts associated with the Project.	Section 4.2.1 and Appendix E (SWA, Section 6.6, 7.4 and 7.6)

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
KSC07	**Wastewater management** Additional details are required to demonstrate compliance with AS1547:2012 (onsite domestic wastewater management) to ensure proposed wastewater management will be effective for wastewater containing human waste.	An updated SWA provides additional details on the wastewater treatment approach. No discharges of wastewater are predicted to be required.	Appendix E (SWA, Section 6.2)
KSC08	**Wastewater management** As part of an onsite wastewater management assessment buffer distances to sensitive receivers (i.e. Macleay River, gullies, dams, creeks etc.) requires careful consideration.	An updated SWA provides additional details on the wastewater treatment approach. No discharges of wastewater are predicted to be required.	Appendix E (SWA, Section 6.2)
KSC09	**Wastewater management** An assessment of construction wastewater is required to determine expected wastewater quality and an associated monitoring program to ensure the treated wastewater that is discharged into the Macleay River is at a standard that will not cause adverse environmental impacts. Water quality monitoring of the Macleay River would be required for the duration of the project to assess water quality (heavy metals, suspended solids, BOD, faecal coliforms etc). Pre-determined trigger levels should be developed and acted upon should they be exceeded.	An updated SWA provides additional details on the wastewater treatment approach. No discharges of wastewater are predicted to be required. A discharge impact assessment has been completed for the construction phase of the Project. A commitment is made to implement water quality monitoring during construction and operation of the Project.	Appendix E (SWA, Attachment C – Discharge Impact Assessment)
Transport			
KSC10	**Upgrades to Kempsey Armidale Road** KSC does not currently have a clear understanding, or agreement relating to the required upgrades of Kempsey Armidale Road, nor how defects in the road arising from transporting goods to site on Kempsey Armidale Road will be addressed.	The proponent has established a MoU/HoA with KSC that outlines how the proposed upgrade works required by the project will be integrated with the proposed works for the KARRP. This MoU/HoA ensures that there is alignment between KSC and the proponent on a suitable approvals pathway, timeline for delivery, and determining the project's funding/contribution to the proposed upgrade works and maintenance.	Section 4.1.1i
KSC11	**Local road upgrades** While the EIS has addressed issues of local road upgrades, it alludes to KSC being responsible for actions and treatment. Further information is required here. KSC should expect to be able to conduct business as usual management of the road. Any additional activities should be the responsibility of the proponent.		
KSC12	**Impacts from natural disasters** Road Upgrades relative to geotechnical stability have not been adequately addressed. Access route via KSC's roads have not been considered in the EIS.		

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
Social impacts			
KSC13	During early works and prior to site mobilisation workers will be expected to source their own local accommodation. When the accommodation camp is opened (dates and timeframes not specified) the accommodation camp will be able to hold 600 people. There is no compulsion for workers to stay at the accommodation camp and many will make a choice to live locally in the community with their partners/family etc. This is a typical response, and the proponent/State government needs to make plans before commencement to address demand for local housing stock and the implications this will have on the existing community in terms of affordability and availability. If not addressed there will be impacts on local services as existing employees transition to short-term higher paying roles and teachers, nurses, casual employees etc. are priced-out of the Kempsey Shire. Local businesses will be affected differently some with connection to the project will flourish and others will have issues retaining staff.	Further analysis has been undertaken and identifies a period of 4 months where there is a deficit of site based construction accommodation for non-local workers. While a full Workforce Management and Accommodation Strategy will be completed by the D&C contractor, the SIA Amendment Reports pinpoints the 4 months of deficit and provides strategic actions to reduce – or even remove entirely – the pressure on local accommodation for non-local workers. The Project will also liaise with social service providers and Council, to build an understanding of crisis accommodation requirements and other business needs in the surrounding localities for local workers (30% of the total workforce) a proportion of whom may seek accommodation closer to the site. However, one of the features of the Strategy would be the consideration of the increased capacity of the accommodation which would provide additional space for local workers.	Section 4.1.4 and 4.2.1
KSC14	Figure 4.3 of Appendix W: Social impact assessment identifies that for at least 12 months worker numbers during construction will be well above 500 at around 700. For comparison Bellbrook has a current population of 339 people. The EIS considers the accommodation camp is the solution to the proportionately large influx of workers to a remote location. Successive state significant projects in rural and regional localities show that many workers want to live with partners or family locally and with their higher earnings the impacts on availability of affordable housing/rentals market and implications for local businesses are negative and significant for the community. The EIS does not consider this eventuality. KSC notes that 30% of locally sourced labour during construction is not a mandated requirement. But the potential loss of up to 247 local employees will potentially have a significant impact on local business functions. The EIS is silent on this issue and solutions. This intensifies the need for State government intervention to provide additional and dispersed accommodation solutions throughout the Shire before the construction phase of the OMPS commences. Otherwise, there will be a lot of vulnerable people who are displaced and no arrangements in place to provide shelter. EIS offers no practical or meaningful solution.		
KSC15	The EIS suggests local tourist accommodation will be taken-up where available during the construction phase of the project. While this is a potential windfall for the businesses there are obvious long-term implications for the Shires developing tourism industry. The EIS has no solution.		

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
Economic impacts			
KSC16	KSC requires more information about the regional economic impact of construction and operational phases and more specifically, an appropriate response to provide the community when questioned regarding the overall benefit of the project to our LGA?	The Project will provide indirect regional benefits through construction by providing jobs and economic growth. Further, a VPA will be entered into that provides direct community benefits and funding to KSC. OMPS have presented details of the VPA to both councils and it is OMPS' intention that a heads of agreement on those details will be finalised prior to determination the Project by the Minister for Planning. Once the VPAs have been formalised, payments to the councils can then be directed to a range of community infrastructure needs and programs.	N/A
Tourist amenity			
KSC17	The EIS identifies impacts during and post construction (night work, lights, stockpile areas etc.) relevant to local tourism. While amenity has been considered and mitigation measures proposed for both natural areas and on residences/lodgings, the EIS lacks information on how the potential impacts will be communicated to tourists utilising the area such as Georges Junction Campground. While not all key tourist sites are managed by KSC, tourists may expect updates to come via KSC.	During construction phase, the proponent will work with key tourism agencies such as NPWS, ARC, KSC and local accommodation providers to notify tourists and visitors of potential impacts to tourist sites such as Georges Junction Campground and the National Trail.	Appendix C (SI03)

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
Geotechnical hazards			
KSC18	The EIS identified significant potential geological hazards that will require further consideration during both the design and construction phases of the elevated dams. While evidence of significant rock falls in the area was acknowledged, the EIS lacks any proposed controls to mitigate potential hazards.	Geotechnical investigations have continued during and following exhibition of the EIS to inform the detailed design of the project. The detailed design will need to ensure geotechnical stability of all embankments required to operate the project. Construction Management Plans will be required for the works which will include identification of risks and hazards as well as the identification of their mitigation and management. Dam construction will likely require the installation of rock catch fences or similar management facilities at the base of the dam to mitigate the risk of uncontrolled rockfalls or similar. The design includes cut slopes, benches, stabilisation and exclusion measures to manage the long-term risk however the final design will be based on the geotechnical investigation results. The design of the permanent spoil emplacements have similarly progressed on the basis of slope stability. These are discussed in the Amendment Report which includes a Basis of Design for all the proposed emplacement areas.	N/A
Community benefits			
KSC19	The EIS, and particularly the social impact assessment, speaks to a community benefits program to be established by negotiation of a Voluntary Planning Agreement. It is imperative that this agreement is negotiated, and public notice provided prior to any consent being issued for the project.	The proponent is currently in discussions with KSC regarding VPA.	Section 4.1.6

4.2.1 Water discharge (KSC04-06)

The water balance model results described in the Surface Water Assessment (Appendix E, Section 7.2.3) indicate most of the local catchment runoff from Fingerboard Crossing Creek will be captured within the Project dams and reservoirs prior to being released downstream at similar rates to existing conditions. Discharges from the lower dam and reservoir are predicted to occur in most years.

The Fingerboard Crossing Creek catchment makes up 0.03% of the overall Macleay River catchment and is anticipated to contribute a proportionate volume of streamflow. Due to the substantial difference in catchment size between the two watercourses, impacts (whether reduced or increased flow) to the Macleay River streamflow regime as a result of impounding Fingerboard Crossing Creek are considered negligible.

Water quality impacts during construction are predicted to occur infrequently, result in minor changes compared to the water quality objectives, and be short term with impacts only occurring during and immediately following rainfall, when discharges are occurring. Hence, no material impacts to the water quality of downstream users are anticipated.

Water quality impacts during operation are limited however consideration of increased concentrations of dissolved metals in receiving waters due to seepage from spoil emplacement areas has been assessed. Any residual pollutants within seepage that occurs from the spoil emplacements would be diluted with runoff from the broader catchment area within the immediate receiving watercourse and before discharging to the Macleay River. Streamflow in the Macleay River is anticipated to be three to four orders of magnitude greater than the local catchment inflows during and following rainfall, when seepage is most likely to occur. Hence, any residual elevated metals concentrations within inflows to the Macleay River are expected to rapidly mix and dissipate.

Project discharges during operations are not expected to result in material impacts to the quality of water extracted by downstream users as:

- Substantial dilution is anticipated to occur in the Macleay River at, and immediately downstream of, the point of discharge.
- Further dilution is expected to occur moving downstream as the contributing catchment to the river increases.
- Discharges from the lower dam and reservoir are primarily predicted to occur during and following rainfall when sediment loads within the Macleay River would be naturally elevated and hence minimal impacts to the ambient water quality are anticipated.

Management measures to mitigate water quality risks associated with Project discharges will be documented in the Soil and Water Management Plan and Erosion and Sediment Control Plans.

4.2.2 Voluntary planning agreement (KSC10-12; KSC19)

A response has been provided in Section 4.1.6.

4.2.3 Construction personnel accommodation (KSC13-15; KSC17)

A response has been provided in Section 4.1.4.

4.2.4 Impact on local business (KSC14)

The Project is aiming to recruit 30% of labour from the local area that is, Kempsey and Armidale LGAs, for the construction phase.

There were 2,446 registered business in Kempsey LGA and 2,900 businesses in Armidale LGA. The main industry for businesses in both LGAs is agriculture, forestry and fishing. As noted in the SIA report, 44.6% of Kempsey LGA's population hold trade qualifications while 28.0% of Armidale LGA's population hold trade qualifications (ABS 2021).

Low labour force participation, high unemployment and high youth unemployment in the local and regional area relative to the NSW average supports the viability of the Project employing a significant local and regional workforce. This may present an opportunity to offer training and apprenticeship opportunities for unemployed and/or disadvantaged youth in the regional area. Further, significant social disadvantage present in Kempsey Shire LGA as well as Armidale Regional LGA which could be reduced due to the take up of local employment opportunities. The focus will be on bringing unemployed people into the workforce and on young people who are yet to join the workforce, not employees of existing local businesses. Therefore, competition for labour generated by the Project is expected to be low.

5 Response to government agency submissions

5.1 Biodiversity, Sciences and Conservation Directorate, including National Parks and Wildlife Services

A revised BDAR has been prepared which addresses comments received by the Department of Planning and Environment (DPE), (now the NSW DCCEEW) on 22 November 2023. The submission and our responses have been considered and summarised in Table 5.1 and Table 5.2 (NPWS comments) and lists where these have been addressed in the revised BDAR.

The BDAR is provided with the Amendment Report with references to specific issues provided here. The BDAR is only appended to the Amendment Report (and not the Submissions Report) because of its size and complexity. As such, the table below provides an indication of whether the issue raised has been responded to and how, with the further detail to be found in the BDAR, as appended to the Amendment Report.

It should be noted that for ease of reference, the Issue Identifier has been added is consistent with the numbering used in BCS's letter submission.

Table 5.1 Response to issues raised by BCS

Identifier	Issue/recommendation	Response summary	BDAR reference where issue is addressed
BCS1.1	The consent authority notes that proceeding with the project at the proposed scale and in the proposed location will result in substantial impacts to threatened species, ecological communities, and their habitats.	The disturbance footprint has been amended to take into consideration comments provided by BCS. These changes have largely reduced impacts to more sensitive SAII threatened entities. Changes have also increased impacts to other species (including one other SAII species). Outstanding surveys for species that were presumed present have been completed which has reduced the number of assumed presence species, and the revised assessment has determined the potential impact to these species has been reduced compared to the original proposal.	The BDAR has been updated to reflect the revised disturbance footprint. An updated assessment of potential impacts and areas of impact has been included in the BDAR provided with the Amendment Report. A summary is provided in Section 5.1.1.
BCS2.1	The BDAR be revised to remove the incorrect terminology which reports 'occupied' and 'potential' brush-tailed rock-wallaby denning habitat and these habitat categories be combined and correctly referred to as 'actual brush-tailed rock-wallaby denning and refuge (critical) habitat.'	Report has updated the terminology and reassessed impacts to the Brush-tailed Rock-wallaby as per the updates in avoidance associated with the project design changes.	The BDAR has been updated and provided with the Amendment Report. Refer Section 8.3.1, Section 9.4 and Section 13.1.2 of the BDAR.
BCS2.2	The consent authority notes the project is likely to have a SAII on the brush-tailed rock-wallaby.	It is requested that this is reassessed in-regards to the avoidance measures associated with the Project design changes.	The BDAR has been updated and provided with the Amendment Report. Refer Section 9.4 of the BDAR.
BCS2.3	The consent authority notes the project is likely to have a SAII on *Pultenaea rubescens*.	It is requested that this is reassessed in-regards to the avoidance measures associated with the Project design changes and additional regional survey's undertaken for this species.	The BDAR has been updated and provided with the Amendment Report. Refer Section 9.2 of the BDAR.

Identifier	Issue/recommendation	Response summary	BDAR reference where issue is addressed
BCS2.4	The proponent consults with BCS to identify additional and appropriate measures to avoid and mitigate the likely SAII on the brush-tailed rock-wallaby and P*ultenaea rubescens* and document these in the RTS report.	BCS was consulted on the 22/01/2024. The Submissions Report discussions and outcomes for these species have been included in this report.	The BDAR has been updated and provided with the Amendment Report. Refer Section 8.3.1, Section 9.2, Section 9.4 and Section 13.1.2 of the BDAR.
BCS3.1	The BDAR be revised to include further information to determine whether the proposal will result in a SAII for wandering pepper cress.	Additional information provided.	The BDAR has been updated and provided with the Amendment Report. Refer Section 9.1 of the BDAR.
BCS4.1	The construction envelope be reduced to align with the disturbance footprint in locations containing threatened flora species, SAII entities, and critical habitat for SAII entities.	Terminology updated to make clear the upper limits of impacts to threatened flora and SAII entities and associated habitat is what is provided in this assessment. Construction envelope has also been reduced to avoid critical SAII habitat where appropriate.	The BDAR has been updated and provided with the Amendment Report. Refer Section 2.3 of the BDAR.
BCS5.1	The BDAR be revised to map the species polygon for *Pultenaea rubescens* in line with the requirements of the BAM and remove all reference to 'occupied' and 'potential' habitat within that species polygon.	Species polygon has been updated, including habitat terminology.	The BDAR has been updated and provided with the Amendment Report. Refer Figure 6.7 in the BDAR.
BCS5.2	The revised BDAR clarify how the species polygon for wandering pepper cress (*Lepidium peregrinum*) was mapped in accordance with the BAM, with consideration of the vegetation zone mapping in Figure 5.1 of the BDAR.	Species polygon has been updated, including PCT association.	The BDAR has been updated and provided with the Amendment Report. Refer Figure 6.6 in the BDAR.
BCS5.3	The BDAR be revised to map species polygons for brush-tailed phascogale (*Phascogale tapoatafa*) in accordance with Section 5.2.5 of the BAM and the requirements of the TBDC	Species polygon has been updated to include all associated PCTs where this species was recorded.	The BDAR has been updated and provided with the Amendment Report. Refer Figure 6.16 in the BDAR.
BCS6.1	The RTS report include an assessment of the impacts of road widening associated with the project along the Kempsey Armidale Road.	The OMPS project will be assessed as part of the cumulative impact assessment for any approvals relating to any proposed road widening.	N/A
BCS6.2	Clarification be provided on whether upgrading the TransGrid line 965 and connecting the pumped hydro project to line 965 will result in any impacts to biodiversity and, if impacts will occur, then an assessment of these impacts be included in a revised BDAR and RTS report.	The OMPS project will be assessed as part of the cumulative impact assessment for any associated works required for upgrades of TransGrid line 965.	N/A

Identifier	Issue/recommendation	Response summary	BDAR reference where issue is addressed
BCS6.3	Additional information be provided in a revised BDAR on prescribed impacts on downstream aquatic and riparian biota, including threatened species and ecological communities, or their habitats, arising from reducing the streamflow of the Macleay River and from operational discharges to the river associated with the project.	Additional information included.	The BDAR has been updated and provided with the Amendment Report. Refer Section 8.2.3 of the BDAR.
BCS6.4	Information be provided in a revised BDAR and RTS report on how the proponent proposes operating the pumped hydro system during extended periods of drought without the required water top ups of the reservoirs from the Macleay River, to ensure the biodiversity impacts during operations are fully assessed.	Additional information included.	The BDAR has been updated and provided with the Amendment Report. Refer Section 8.2.3 of the BDAR.
BCS6.5	The BDAR be amended to include an assessment of the potential impacts of *Phytophthora cinnamomi* on *Pultenaea rubescens* from the various disturbances associated with the project.	Included as an indirect impact.	The BDAR has been updated and provided with the Amendment Report. Refer Section 8.1.3 and 8.3.2 of the BDAR.
BCS7.1	The BDAR be revised to determine the presence of candidate threatened flora species in all areas of unsurveyed 100 m grid intersection locations by surveying, by assuming presence or by obtaining an expert report.	Text updated with surveyed requirements under NSW Guidelines for Surveying Threatened Plants and their Habitats (DPIE, 2020b). See figure for two phase grid completion as per the key. Missing GPS tracks added to Figure 6.1.	The BDAR has been updated and provided with the Amendment Report. Refer Section 6.3.3. and Figure 6.1 of the BDAR.
BCS8.1	The BDAR be revised to include the Eastern cave bat as a candidate species for all IBRA subregions on the project site within the subject land.	This species was added as a candidate species.	The BDAR has been updated and provided with the Amendment Report. Refer Table 6.2 of the BDAR.
BCS8.2	The BDAR be revised to include a SAII assessment for the Eastern cave bat for any impacts to its breeding habitat (caves, cliffs, scarps, and rock overhangs including a 100 m buffer).	This species is not considered to be present within the Project area.	The BDAR has been updated and provided with the Amendment Report. Refer Section 6.3.6 of the BDAR.
BCS9.1	A revised BDAR demonstrate that a minimum of one BAM plot has been completed in the mapped northern-most extent of the area mapped as PCT 868 to determine if this is the correct PCT and to provide data to determine the vegetation integrity score.	Site surveys included rapid vegetation assessments within this area to determine the PCT and condition. This concluded that this area was the same PCT and condition as other areas of PCT 868 High where plots were undertaken. This PCT has vegetation zone has been assigned as high, therefore applying the highest vegetation zone score. Twelve BAM plots were undertaken within PCT 868 (high) vegetation zone that has an impact area of 58.1 ha. The minimal number of plots required per zone (BAM Subsection 4.3.4) for 50–100 ha is 5 plots.	The BDAR has been updated and provided with the Amendment Report. Refer Figure 5.1 in the BDAR.

Identifier	Issue/recommendation	Response summary	BDAR reference where issue is addressed
BCS10.1	The BDAR be revised to include assessments of impacts from stormwater and surface water discharge points on threatened flora, threatened flora habitat, and EECs known to occur on the project site.	An updated SWA and a discharge impact assessment have been prepared (Appendix E of this Submissions Report) and the outcomes were reviewed and considered in the BDAR.	The BDAR has been updated and provided with the Amendment Report. Refer Section 8.1.3 and 8.2.3 of the BDAR.
BCS11.1	Positive identification of the Cryptic Forest Twiner (*Tylophora woollsii* or *Tylophora* sp.*) be determined and the BDAR revised as required.	The known locations of this species were resurveyed during the flowering period in 2023 and 2024. Both survey efforts failed to observe this species in flower, which is the key distinguishing feature to identify this species from the more common Thin-leaved Twiner (*Tylophota paniculata*). Due to the lack of flowering specimens, samples were undertaken in 2024 for genetic analysis. Genetic analysis showed that the plants sampled from the Project area are genetically similar to both the Thin-leaved Twiner and Cryptic Forest Twiner. Based on the data analysis conducted to date, the species may not be clearly distinguishable based on commonly used plant genetic barcodes. Using the precautionary principle, the records within the construction envelope remain as assumed to be Cryptic Forest Twiner.	The BDAR has been updated and provided with the Amendment Report. Refer Section 6.3.3 and 6.3.5 of the BDAR.
BCS12.1	The data and information inconsistencies in the BDAR identified in this response be reviewed and corrected.	Ecosystem species have been included. Reference to Barrett in press has been updated as requested throughout the BDAR. Additional clarification provided for survey effort for microbat roost sites. Reference of applying mitigation removed as requested.	The BDAR has been updated and provided with the Amendment Report. Refer Table 6.1, Table 6.10. and Section 8.3 of the BDAR.
BCS13.1	Additional information is required to enable BCS to assess the project under the bilateral agreement with the Australian Government.	Surveyed undertaken as per the Matters of National Environmental Significance: Significant Impact Guidelines 1.1 *Environment Protection and Biodiversity Conservation Act 1999.* This BDAR in line within requirements of the BAM and SEARs.	The BDAR has been updated and provided with the Amendment Report. Refer Section 13.1 of the BDAR
BCS14.1	The BDAR be revised to correct the information used in assessments of significance for MNES and rectify the issues described in Attachment 2 of this response.	Additional information and assessment undertaken for Tall Velvet Sea Berry. Brush-tailed Rock-wallaby and *Pultenaea rubescens* MNES assessment has been updated to take into consideration updated in design.	The BDAR has been updated and provided with the Amendment Report. Refer Table 13.10, Table 13.12, and Table 13.20 of the BDAR.
BCS14.2	The consent authority notes that BCD disagrees with the conclusion of the MNES assessment assessments of significance for brush-tailed rock-wallaby and *Pultenaea rubescens*, and that BCD's review of the project suggests it is likely to have a significant impact on these two MNES entities.	Assessment has been updated to include the avoidance measures as a result of project design change in the RTS phases and additional survey effort.	The BDAR has been updated and provided with the Amendment Report. Refer Section 13.1.2 of the BDAR.

Identifier	Issue/recommendation	Response summary	BDAR reference where issue is addressed
BCS15.1	Further information be provided in a revised BDAR to demonstrate how species richness was determined in accordance with the EPBC Act listing advice for Lowland Rainforest of Subtropical Australia (DSEWPC, 2011).	Data updated.	The BDAR has been updated and provided with the Amendment Report. Refer Table 5.10 of the BDAR.

Table 5.2 Response to issues raised by NPWS

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
NPWS16.1	As part of a RTS report, additional assessment be completed of the noise and vibration impacts for sites and areas within the declared wilderness, treating wilderness users as 'sensitive receivers' that are more sensitive than residents.	The receptor type 'passive recreation' has been applied to campgrounds in the vicinity of the project in accordance with the *Noise Policy for Industry*. Any additional assessment should be carried out as per the NPfI and the ICNG, which would classify wilderness areas as 'passive recreation' areas. The 'passive recreation' receptor type is typically applied to places where people normally go to undertake quiet activities (e.g. picnics, bushwalks, etc.) and the noise goals applied at these locations are considerably less stringent than those applied at residential receptors. Given this, it is likely that construction noise levels would be below the relevant 'passive recreation' noise goals at locations that wilderness users would typically access/frequent.	N/A
NPWS16.2	The existing visual impact assessment be revised as part of a RTS report to include additional analysis of the predicted impacts at vantage points overlooking the project site located in the declared Macleay Gorges and Kunderang wilderness areas.	Limited vantage points exist overlooking the Project site within the declared Macleay Gorges and Kunderang wilderness areas. A portion of the National Trail along the river banks of the Macleay River was visited from East Kunderang Homestead (VP1). The trail was surrounded by dense bushland and scrub. VP2 (Marys View) is located within the Kunderang Wilderness Area and was assessed as a key viewpoint. Visible portions of the project were primarily limited to transmission towers and lines and the overall visual impact rating at this location is Moderate.	N/A

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
NPWS17.1	The potential for impacts on the World Heritage values of the Gondwana Rainforests be reassessed as part of a RTS report, considering changes in movement and population dynamics of motile species such as brush-tailed rock-wallabies.	The World and National Heritage Assessment for the Gondwana Rainforests considered populations of motile species such as Brush-tailed Rock wallabies specifically to colonies known within the Project area that may be impacted. These colonies are not connected with those within the World heritage property. Further, potential impacts to these species have been reduced through amendments to the Project design, including removal and realignment of access roads to avoid critical habitat. With the changes made to the Project, with results as outlined in the BDAR, this would not result in any additional impacts to those outlined in the World and National Heritage Assessment provided with the EIS.	N/A
NPWS17.2	The RTS include appropriate mitigation options to limit impacts to the park's threatened species due to works within the project site.	The BDAR has been updated to incorporate project amendments and issues raised in submissions. No direct impacts to species within the park would occur. Updated mitigation measures are identified with regard to limiting worker impacts on the surrounding NPWS land.	Appendix C
NPWS18.1	Potential impacts on the East Kunderang Station's amenity and setting be discussed with the Aboriginal community before the development application is determined, and specifically in the context of the State Heritage Register listing.	An updated Aboriginal Cultural Heritage Assessment (ACHA) has been undertaken in light of the project amendments and is appended to the Amendment Report.	N/A
NPWS18.2	The noise and vibration impact assessments be revised as part of a RTS report to predict likely impacts on visitors staying at the East Kunderang Station, with this site being considered equivalent to a sensitive residential receiver rather than a commercial accommodation facility.	The East Kunderang Station can be assessed as a private residence only if it is an "approved dwelling". Notwithstanding, given the predicted noise levels at the East Kunderang Station (predicted at 33 dB day; 34 dB out of ours), it would also comply with the residential receiver criteria (45 dB day; 35 dB night), if applied.	N/A
NPWS18.3	Any construction works likely to generate noise impacts more than 35dB(A) in the surrounding national park estate be conditioned to avoid school holidays and weekends.	Any additional assessment should be carried out as per the NPfI and the ICNG, which would classify wilderness areas as 'passive recreation' areas. The 'passive recreation' receptor type is typically applied to places where people normally go to undertake quiet activities (e.g. picnics, bushwalks) and the noise goals applied at these locations are considerably less stringent than the 35 dB specified. Given this, it is likely that construction noise levels would be below the relevant 'passive recreation' noise goals at locations that wilderness users would typically access/frequent.	N/A

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
NPWS18.4	Pumping water from the Macleay River be conditioned to only occur during periods of quantifiable high-water flow, so that environmental flows are maintained and the impacts on aquatic ecology are minimised.	To minimise potential impacts to downstream users and environmental receptors, extraction for initial fill purposes will only occur during periods of high flow. where high flow is defined as the 50th percentile streamflow (i.e. the flow that is exceeded on 50% of days), where the 50th percentile stream flow is 597 ML/Day	Table 5.2 of the updated SWA
NPWS19.1	The modelled noise impact assessment be revised as part of a RTS report to include meteorological conditions that reflect the weather conditions commonly recorded in the surrounding area.	As per Section 3.4 of the NVIA, worst-case meteorological conditions have been modelled in lieu of conducting an analysis of the prevailing conditions. It is considered determining the prevailing conditions would lead to the noise predictions being the same or revised lower than previously predicted.	N/A
NPWS20.1	Appropriate mitigation measures be identified as part of a RTS report to reduce unauthorised use of the NPWS parks and declared wilderness near the project site.	Access to the site through NPWS land will be for an initial mobilisation of plant and equipment to the upper reservoir area only, or for emergency access and egress. Access through the NPWS and application of any access requirements stipulated by NPWS will be included in the Traffic Management Plan for the Project. Mitigation measures have also been identified to be included as part of a Workforce Management Plan to ensure on-site workers do not participate in unauthorised use of NPWS parks and declared wilderness. Mitigation and management has also been recommended as part of the SIA Amendment Report to be protective of recreational use of the area.	Section 5.1.2 and Appendix C (Updated Mitigation Measures)
NPWS21.1	Approvals for access to and from the south of the project site onto the Carrai Plateau through the Carrai State Conservation Area and private lands be identified as 'other approvals' and included in the conditions of consent.	Engagement with NPWS is ongoing however it is agreed access arrangements and road work approvals through Carrai State Conservation Area will be via other approval processes with NPWS (see Section 3.2.3).	Section 3.2.3 and 5.1.2
NPWS22.1	The proposed upgrade to Line 965 be included in the RTS report noting the SEPP (Planning Systems) 2021 identifies the existing transmission network upgrade to be part of the project.	A separate application for the upgrade to Line 965 will be sought via Transgrid as the owner and operator of the asset.	N/A
NPWS22.2	NPWS be identified as a key stakeholder in the proposed Kempsey Road and Line 965 upgrades.	NPWS is a key stakeholder and neighbour to the Project. Ongoing engagement will be required.	N/A

5.1.1 Impacts to threatened species, communities and their habitats

Since public exhibition of the EIS, additional survey effort has been completed to fulfil BAM requirements and comments received from BCS, as well as incorporate new areas resulting from changes to the construction envelope and disturbance footprint. Relevantly, surveys of adjacent land proposed as offset as part of the BSA have commenced and provides greater understanding of target threatened species extent in the local area and region.

i SAII assessments (BCS1.1; BCS2.2-2.3; BCS3.1)

Incorporating additional survey effort completed in 2023–2024, additional and updated assessments have been completed for threatened species at risk of serious and irreversible impacts (SAII).

BCS noted in its submission that the project is likely to have a SAII on *Pultanaea rubescens* and Brush-tailed Rock-wallaby and requested further information on Wandering Peppercress. It is requested that this is reassessed in-regards to the avoidance measures associated with the Project design changes and updated information provided in the revised BDAR, which is summarised as following in Table 5.3.

Table 5.3 SAII assessment summary

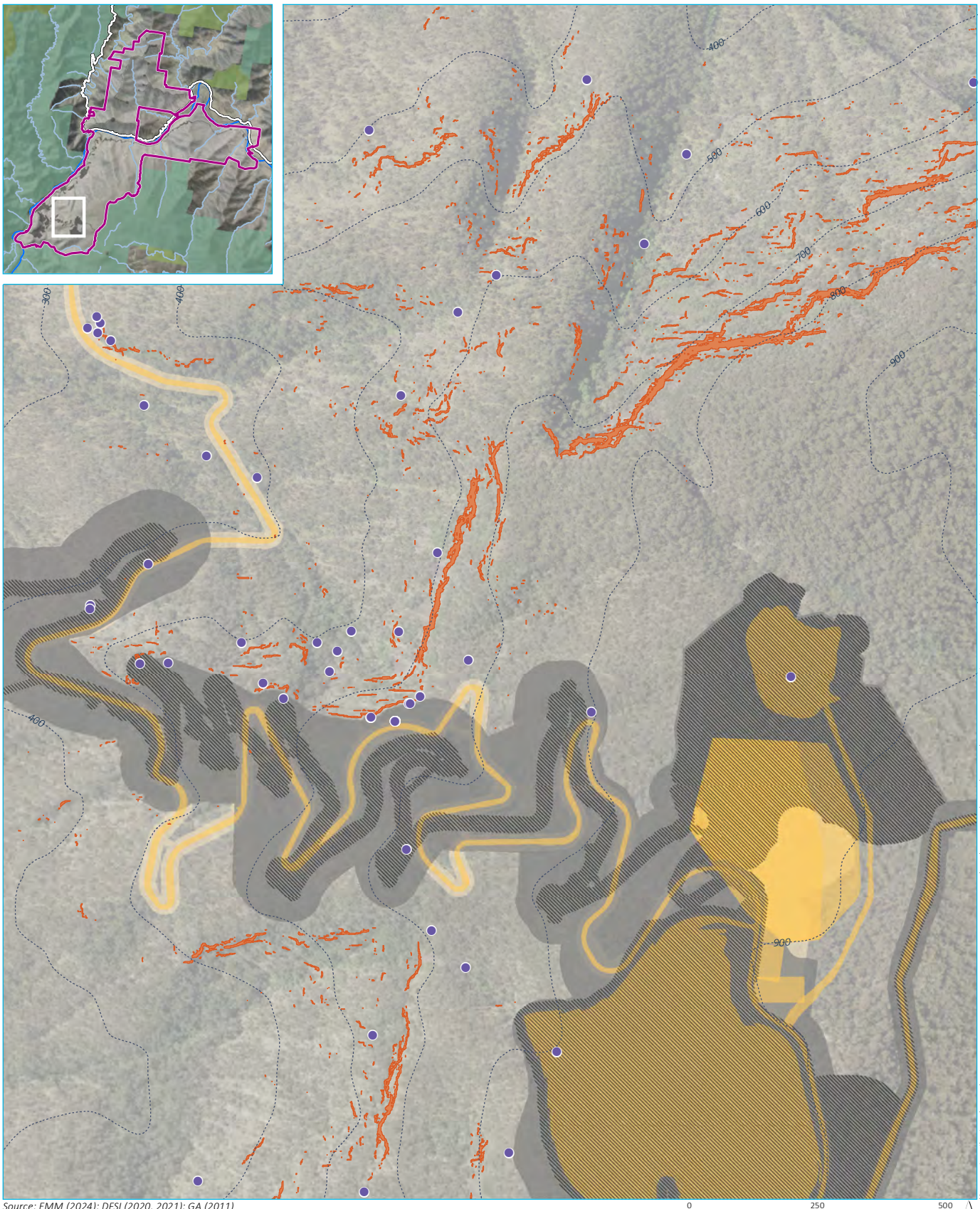
Species	Avoidance measures	Residual impact summary	Section in BDAR
Wandering Pepper Cress	The consideration of options and development of the Project was informed by the occurrence of this species within the construction envelope. The disturbance footprint was moved outside of the floodplain area where large numbers of this species was recorded. This design modification will result in retention of over 384 plants. The location of the temporary bridge is an area that contains rocky substrates in which this species was observed to be largely absent. Therefore, this location is considered to lack suitable microhabitat for this species. The location for the temporary bridge will be rehabilitated on the completion of the works and would not lead to long term impacts on the dispersal of seeds along this area of the Macleay River flood plain.	Due to the small proportion of habitat to be impacted within the local geographic range of this species (1.52%), and the lack of permanent habitat fragmentation expected (disturbance footprint is located upslope of all records of the species), the proposed works are unlikely to impact on the ecology of the subpopulation.	9.1
Pultenaea rubescens	The consideration of options and development of the Project was informed by the occurrence of this species within the construction envelope. Spoil locations and the emergency access road in the upper reservoir were modified to avoid impacts to *Pultanaea rubescens* following targeted surveys once this species was identified as potentially being classified as a new species. This design modification will result in avoidance of removal of approximately 143 plants, avoiding direct impacts to all individuals recorded within the construction envelope.	The Project will not impact on any individuals, or microhabitat for this species. No direct impacts will occur on the known occurrences of this species as microhabitat has been excluded from the construction envelope. Indirect impacts have been considered including from the fire regime, shadowing and surface water changes. The Project is considered unlikely to significantly impact the population.	9.2
Brush-tailed Rock-wallaby	The consideration of options and development of the Project was informed by occurrence of actual Brush-tailed Rock-wallaby denning and refuge (critical) habitat to support Brush-tailed Rock-wallabies and records of this species on site resulted in changes to the lower to the upper dam access road. As part of the response to submission stage, the access road between the lower and upper reservoir was redesigned to avoid direct impacts to a large colony that was located within the disturbance footprint. A reduced speed limit will be imposed along access roads adjacent to habitat areas to avoid indirect impacts due to fauna vehicle strike. The Project will also implement a pest and predator monitoring and control program to ensure the works do not result in a significant increase in predator numbers.	The Project may have an indirect impact on a small colony that may be associated with a larger colony located to the north. The majority of critical habitat that supports this species will be retained within the project area. The Project is considered unlikely to significantly impact the population.	9.4

ii Reduce construction envelope (BCS4.1)

The construction envelope has been reduced to align to the disturbance footprint in key locations:

- Along the UDAR to avoid critical habitat for the Brush-tailed rock-wallaby (shown in Figure 5.1). This includes the complete removal of a north-south road linking the Main Access Road and the UDAR, an area which recorded a population of Brush-tailed rock-wallaby and associated denning habitat.
- Upper PSE and Carrai access area to avoid individuals and microhabitat for *Pultenaea rubescens* (shown in Figure 5.2). No flexibility is provided to the design in these areas to ensure direct impacts are avoided.

In some areas, the construction envelope and disturbance footprint were unable to be reduced. These areas are constrained in design and constructability and were unable to be further refined.



Source: EMM (2024); DFSI (2020, 2021); GA (2011)

0 250 500 m

GDA 1994 MGA Zone 56

N

KEY

- Project area
- Construction envelope
- Current disturbance footprint
- Previous design disturbance (Nov 2020)
- Previous design disturbance (Aug 2022)
- Brush-tailed Rock-wallaby sighting
- Actual brush-tailed rock-wallaby denning and refuge (critical) habitat

Existing environment

- Macleay River
- Named watercourse
- Major road
- Contours (100 m)
- NPWS reserve
- State forest

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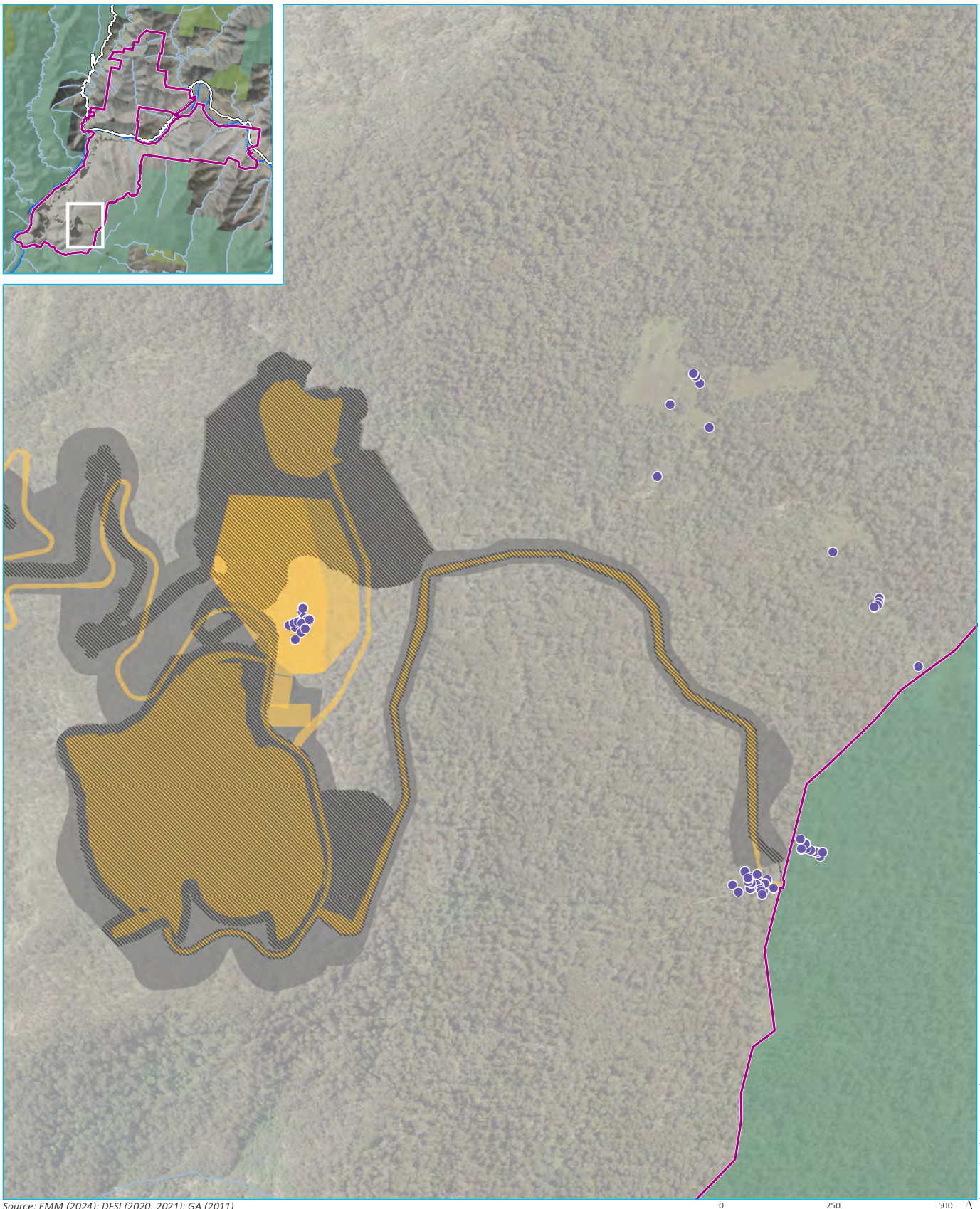
Additional avoidance in design measures for Brush-tailed Rock-wallaby

Oven Mountain Pumped Hydro Energy Storage Project
Submissions Report
OMPS Pty Ltd
Figure 5.1

EMM creating opportunities



Source: EMM (2024); DFSI (2020, 2021); GA (2011)

0 250 500 m

GDA 1994 MGA Zone 56

N

KEY

- Project area
- Construction envelope
- Current disturbance footprint
- Previous design disturbance (Aug 2022)
- *Pultenaea rubescens*

Existing environment

- Macleay River
- Named watercourse
- Major road
- NPWS reserve
- State forest

Additional avoidance in design measures for *Pultanaea rubescens*

Oven Mountain Pumped Hydro Energy Storage Project
Submissions Report
OMPS Pty Ltd
Figure 5.2

EMM creating opportunities

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5.1.2 Use and access through NPWS land (NPWS20.1; 21.1)

Access to the site through NPWS land will be for an initial mobilisation of plant and equipment to the upper reservoir only, or for emergency access and egress during construction and operation. Access through the NPWS and application of any access requirements stipulated by NPWS will be included in the Traffic Management Plan for the Project.

Mitigation measures have also been identified to be included as part of a Workforce Management Plan to ensure on-site workers do not participate in unauthorised use of NPWS parks and declared wilderness.

The proponent has been engaging with NPWS with regard to access through NPWS land, in particular via the Carrai. Discussions to date have included timing of the Project and understanding any planned works by NPWS for the Carrai and how they may interact.

5.2 CASA

CASA provided a submission on the Project. The submission stated that CASA has no objections to the proposal and no recommended conditions. CASA made comment that low flying helicopter operators may request obstacle markers on the transmission lines however this is not regulated by CASA.

The Project will require low flying helicopters from time to time, and they will also form part of the Project's Emergency Management Plan. The RFS provided a submission on the Project (see Section 5.13) and consultation with RFS is ongoing, including ensuring RFS is provided opportunity for feedback on emergency management. NPWS have also been consulted as part of the Project and consultation is ongoing.

5.3 Crown Lands

Crown Lands provided a submission on the Project. The submission commented on:

- Crown Lands that have and have not been confirmed as being impacted by transmission lines, transmission towers and access roads
- works proposed on Crown Reserves
- Access to the Macleay River Trail/Bicentennial National Park
- previous restrictions lifted from freehold titles
- extinguishing native title
- purchasing crown roads
- Crown Lands licencing.

5.3.1 Access, easements and licences

The proponent is undertaking discussions with Crown Lands to secure the required licenses, negotiate native title, discuss previous leases, obtain easements and purchase land to allow the proposed works to proceed.

The proponent is undertaking discussions with Crown Lands to:

- Secure the required licence for the Macleay River Pump Facility.
- Obtain the easements or licences required for the construction of transmission lines and towers within Crown land and waterways.

- Determine the best option to progress forward with the construction of an access road; this includes any required discussions or negotiations with Armidale Council and LALCs that needs to be undertaken.

- Obtain all required applications, conditions, concurrence, deeds or licences in relation to Native Title. The proponent will undertake discussions with the affected LALCs to obtain a deed of agreement where an undetermined ALC exists; guidance will be taken from Crown Lands to ensure correct compliance is adhered to in regard to the *Native Title Act 1993* and the issue of a licence if required.

The proponent is also undertaking discussion with Crown Lands regarding previous Crown Land leases that affect freehold lots. This includes associated restrictions under Section 77a or 77b of the *Crown Lands Act 1989* that may impede the construction of an access road.

5.3.2 Access to the Macleay River Trail/Bicentennial National Park

The Crown Lands submission notes that two sections of a Council road/Shared Crown Council road corridor east of the Macleay River adjacent to or within Lot 37 DP 756471 (north of Broad Crossing) are within the proposed Project area. As well as forming a part of the Bicentennial National Trail, the Macleay River Trail is a registered fire trail and should not be impeded.

The official Bicentennial National Trail map of Section 8, Map 4 Georges Junction – Left Hand Hut shows the National Trail runs predominantly along the east of Macleay River from Georges Junction to Peach Tree Crossing. The Trail crosses the Macleay River at various intersections including:

- between Broad Crossing and Flaggy Rock Crossing

- at Raffertys Crossing

- at Fingerboard Crossing

- at Peach Tree Crossing/East Kunderang Homestead

- at Carrai Flats.

The Trail, therefore, is situated within the Project site for 9.9 km between Georges Junction and Peach Tree Crossing where it then crosses the river to East Kunderang Homestead.

The Project will not impact the use, setting, or landscape of the National Trail both during construction or operations. Hikers and horse riders travelling along the National Trail will have views into some parts of the development during construction. Views of project infrastructure will only occur along a short portion of the Trail. However, over the 6 km distance from Georges Junction to the reservoirs, travellers along the Trail will have occasional views of the access road, accommodation camp, laydown areas, and office structures. These views will occur over a longer distance as travellers make their way along the Trail. As the Project site establishment works and construction activities are considered temporary, landscaping is not proposed to mitigate visual impacts during the construction phase.

It is proposed that the Construction Environmental Management Plan for the Project include safety and security of the construction works including fencing and communications to ensure that no accidental egress by trail hikers can occur. It is also proposed that specific information is disseminated to trail walkers via the National Trail Trust via whose website trail walkers use to plan their journey.

Subsequent to construction, it is proposed to erect wooden fences in the style of National Parks signage to allow trail walkers and hikers to know of the location of the Project, including biodiversity offset areas adjacent to the trail through which there should be no egress. Key "do's and dont's" for trail walkers and hikers (to prevent the spread of weeds or other potential impacts) would also be disseminated to hikers via the national Trail website with their other trail hike planning materials.

5.4 Dam Safety NSW

Dams Safety NSW commented the substantial size of the dams makes it probable that they will be 'declared' by Dams Safety NSW. It was stated that prior to construction (preferably at concept design stage) the proponent will need to contact Dams Safety NSW and provide details of the proposed dams and their consequence categories as determined by a dam break assessment undertaken by a suitably qualified dams engineer.

Both the Sunny Day Consequence Category (SDCC) and Flood Consequence Category (FCC) for both the upper and lower dams will be determined in accordance with *Dams Safety New South Wales – Declared dams consequence category assessment and determination methodology for Dams Safety Act 2015, Government Gazette of the State of New South Wales, Number 113–Electricity and Water, 18 March 2022*, undertaken by a suitably competent person and reviewed by an independent competent person.

5.5 NSW DCCEEW Water Group (formally DPE Water)

A revised SWA and groundwater impact assessment (GIA) has been prepared which addresses comments received by the Department of Planning and Environment (DPE), (now the NSW DCCEEW) on 22 November 2023. These reports are included as Appendix E and Appendix F, respectively. The submission and responses have been summarised in Table 5.4 and lists where these have been addressed in the revised SWA and GIA.

Table 5.4 Summary of surface water related agency advice

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
DCCEEW 1.1	The proponent should demonstrate the ability to obtain the necessary water entitlement in the relevant unregulated surface water source/s to account for water take during the construction and operational phases of the project.	SWA updated to include further analysis of the availability of water entitlements and trade opportunities in the relevant unregulated surface water sources.	Appendix E (SWA, Section 10.5.2)
DCCEEW 1.2	The proponent should improve the maximum annual groundwater take estimation from aquifer interference activities and/or other groundwater extraction. This estimation should be itemised by groundwater source for each water year of the five-year construction period and for the operational life of the scheme. The ability to obtain sufficient entitlement in the water source/s needs to be demonstrated.	GIA updated to include estimation of groundwater take estimation by source each year.	Appendix F (GIA, Section 12.2.3)
DCCEEW 1.3	The proponent should update the water licensing requirements for the project to include the need to account for the predicted 67 ML/year of water take in the Macleay Gorges water source due to runoff captured in the project's upper dam.	Water take associated with the upper dam included in revised water licensing requirements.	Appendix E (SWA, Section 10.4.2)

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
DCCEEW 1.4	The proponent should confirm the requirement to construct and operate groundwater supply bores for the project. Should bores be required, the proponent should provide an impact assessment on water users, water source/s and dependent ecosystems.	Approval to construct a test bore has been obtained by the proponent to determine whether adequate groundwater yield and quality can first be obtained, before seeking approval for any additional groundwater supply bores.	Appendix F (GIA, Section 12.4.1)
DCCEEW 1.5	The proponent should ensure that applications submitted to DPE Water for Specific Purpose Access Licences (SPAL) are for the minimum volume required and are supported with appropriate justification.	Report updated to include justification for the minimum SPAL requirement.	Appendix E (SWA, Section 10.4.1)
DCCEEW 1.6	The proponent should acquire sufficient water entitlement in a Water Access Licence (WAL), in the relevant water source/s, to account for the maximum predicted water take prior to the take occurring.	A commitment is made to acquire sufficient water licences prior to take occurring.	Appendix E (SWA, Section 10.7)
DCCEEW 2.1	The proponent should provide potential viable options for managing the infiltration and groundwater mounding arising from reservoir and tunnel construction/operation.	Management plans and monitoring and thresholds have been identified in the updated GIA.	Appendix F (GIA, Section 11.4)
DCCEEW 2.2	The proponent should provide a detailed tabulation that describes how the monitoring and modelling requirements advised by DPE Water have been incorporated into: • the monitoring network • the initial numerical model design • ongoing refinement of the model at review milestones.	Information has been added and provided in an updated GIA.	Appendix F (GIA, Section 5.2.1, 9.2.2, 11.4.3)
DCCEEW 2.3	The proponent should develop a construction and operational groundwater management plan in consultation with DPE Water that includes a groundwater monitoring, reporting and trigger action response programme. The construction and operational plans must include: • Specific groundwater dependent ecosystem (GDE) monitoring to enable detection of potential water table drawdown during the construction phase. • Monitoring of mounding effects during the operational phase, which could enhance baseflow discharge to the Macleay River valley and spring discharges.	Management plans and monitoring and thresholds have been identified in the updated GIA.	Appendix F (GIA, Section 11.4)
DCCEEW 2.4	The proponent should install monitoring device/s and or bore/s close to and deeper than the deepest part of the scheme. These are to be located near the station cavern and deeper than its base, and installed and used as follows: • The deep monitoring setup must be installed as soon as practicably possible to enable the use of its data in the required first round of model validation and updating. • Monitored to collect hydrogeological data to confirm the parameter values used in the corresponding model layer. • Monitored to use groundwater head data in model validation (post-audit) that is required to be part of future model updating.	Monitoring network has been progressively expanded as new monitoring bores have been installed. All data loggers have been downloaded monthly to inform updated groundwater modelling. Monitoring is ongoing on a quarterly basis.	Appendix F (GIA, Section 11.4)

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
	• Included in the monitoring plan.		
DCCEEW 2.5	The proponent should complete groundwater model validation (post audit) and updating as follows: • Validate and update the model within three months of the following milestones: a) One year and 3 years from the start of construction. b) One year and 6 years from the end of the construction, the later corresponds to 10 years from the start of construction. • Incorporate deep layer measurements (parameters and observed heads). • Consider all remaining comments from the independent peer review in the future models. • Check model validity using recently collected data. • Refine and/or recalibrate the model if needed. • Revise predictions if needed, including uncertainty analysis.	Model validation has been included in the water management strategy for the Project.	Appendix F (GIA, Section 11.4.3)
DCCEEW 3.1	The proponent should provide: • Additional details on the modelling used to estimate flow metrics and changes to flow regimes to enable further consideration of potential impacts on aquatic ecology and dependent species. • Additional details on the specific operational regimes that would be implemented under average, drought and flood conditions. • An updated impact assessment on ecologically significant flows and consequences for critical life stages of flow dependent species, e.g. fish.	SWA updated to include additional details on the modelling used to estimate impacts to flow regimes. SWA updated to include additional details on specific operational regimes under average, drought and flood conditions. Aquatic assessment completed for ecologically significant flows and consequences on flow dependent species.	Appendix E (SWA, Section 6.3.5, 7.3.5) Aquatic Addendum (see Amendment Report)
DCCEEW 3.2	The proponent should review the cease to pump (CtP) and commence to pump (CommtP) rules for the initial fill and operational phases in consultation with DPE Water.	EMM/Alinta consulted with DPE Water on the cease to pump and commence to pump rules in a meeting dated 9 May 2024.	Appendix E (SWA, Section 5.5.5, 10.6)
DCCEEW 3.3	The proponent should provide further detail on the riparian habitat features to be impacted and include detail on how, where and when the proposed mitigating measures are to be implemented.	Further detail and mapping has been prepared as well as updated mitigation measures.	Appendix E (SWA, Section 6.5.4) Aquatic Addendum (see Amendment Report)

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
DCCEEW 3.4	The proponent should provide further detail and impact assessment of the proposed bridge over the Macleay River. This is to include: • A detailed plan showing its position and orientation in relation to the river. • A risk evaluation of disturbance to unconsolidated bars, benches and banks of the Macleay River. This is to assess: – The hydraulic conveyance along the Macleay River between East Kunderang and Comara. – The shear stress and competence of bed materials, bars and sediment conveyance through the bridge. • A preliminary design plan for the approaches to, abutments and deck height of the proposed bridge. This is to include a justification based on the assessment in the previous point. • Updated mitigation measures.	SWA updated to include further details on the design and mitigation measures associated with the Macleay River bridges. SWA updated to address risks and potential impacts to hydraulic conveyance and shear stress resulting from the Macleay River bridges.	Appendix E (SWA, Section 5.9.2 and Attachment D)
DCCEEW 3.5	The proponent should provide a preliminary design plan for the proposed road and watercourse crossings between the development site, including Carrols Creek, Oaky Creek and Waterloo Creek. These designs should consider channel constraints and potential impacts to bed and banks of the watercourses that require a bridge or culvert crossing and a justification for preferred options.	SWA updated to include further details on the design plans for key watercourse crossings.	Appendix E (SWA, Section 5.9.3)
DCCEEW 3.6	The proponent should provide mitigation actions to improve watercourses in the Macleay River catchment due to the hydrologic and geomorphic impacts to Fingerboard Creek.	Impacts due to impounding Fingerboard Crossing Creek are not predicted to cause measurable alteration to the flow or sediment budget of the broader Macleay River catchment. No mitigation actions are proposed to improve watercourses not impacted by the Project.	N/A
DCCEEW 3.7	The proponent should prepare a Water Management Plan for construction and operational phases to monitor and manage geomorphic processes in the Macleay River to address the following: • Identification of risks/changes to channel form, sediment transportation and shear stress on the bed and banks of the Macleay River, in its current state, and from alterations that may result from the proposed bridge construction: – The inclusion of a trigger action response plan to detect and remediate impacts caused by redirection of flows and/or accumulation of sediment to the bridge and approaches. – Monitor, manage and remediate potential impacts to sections of Carrols Creek and other watercourses affected by the project. • Detail specific erosion prevention and mitigation measures. • Rehabilitate the riparian zone. • Monitor, manage and remediate surface and groundwater quality impacts.	A commitment is made to prepare a Soil and Water Management Plan (SWMP) for construction and operational phases of the Project.	Appendix Cand Appendix E (SWA, Section 9)

5.6 Department of Primary Industries – Agriculture

A submission was received from the Department of Primary Industries – Agriculture. The submission stated that the EIS adequately identified the potential agricultural impacts for land in the vicinity of the proposed development, and proposed mitigation measures are considered adequate to mitigate potential impacts on agricultural land and production. No comments or additional requirements for the Project were identified.

5.7 Department of Primary Industries – Fisheries

A submission was received from the Department of Primary Industries – Fisheries (DPI Fisheries). The submission and responses have been summarised in Table 5.5 and lists where these have been addressed in the revised SWA (Appendix E) and within an Addendum to the aquatic ecology impact assessment (AEIA). The AEIA Addendum has been prepared to assess changes to the Project. As such, the AEIA Addendum is provided as an appendix to the Amendment Report and should be read in conjunction with this Submissions Report.

Table 5.5 Summary of responses to DPI Fisheries

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
DPIF01	The construction of waterway crossings should be in accordance with DPI Fisheries Guideline document: *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings*. This is to ensure that the works are designed and constructed in accordance with best management practice and with minimal impact on the aquatic environment within the immediate vicinity of the proposed works.	A commitment is made to construct waterway crossings in accordance with DPI Fisheries Guideline document: *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings*. Where instream work is required, effort will be made to minimise impacts to flow, and instream connectivity and release of soils into the system.	Appendix C (AE06)
DPIF02	DPI Fisheries anticipate construction methodology will ensure that bridge/road crossing construction maintains fish passage during all stages of the project such that temporary blockages to fish passage during construction will not be required. Detailed Design Plans, Construction Environmental Management Plans and Soil and Water Management Sub Plans will be required for waterway crossings in Key Fish Habitats to minimise impacts on the aquatic environment.	A CEMP and related sub plans will be drafted prior to construction commencing. These plans will contain provisions for managing impacts and monitoring water quality, key fish habitat and fish passage during Project construction.	Appendix C
DPIF03	The new river pump infrastructure should include the use of extraction screen technology to reduce the impacts of pump infrastructure removing and damaging eggs, larvae, and juvenile fish from the Macleay River. The EIS makes reference to works taking place in accordance with the DPI documents *A guide to modern fish-protection screening in Australia and Design specifications for fish-protection screens in Australia*. Final designs and specifications of the fish protection screening infrastructure will be required by DPI Fisheries to review.	A commitment is made to consult with DPI Fisheries throughout the Macleay River pump and fish screen detailed design process.	Appendix C (AE04)

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
DPIF04	Consideration should also be given to the use of screens for water pumped from the lower intake structure within the lower reservoir to the upper reservoir and at the upper intake structure within the upper reservoir to the underground tunnels to reduce the likelihood of native fish and eels which form populations within the reservoirs passing through the turbines resulting in injury and mortalities.	No fish screens are proposed for the reservoir intakes. Screens on the closed loop pumped hydro project main waterway intakes is not feasible given the scale of the generation flow. Fish screening on the Macleay River pump station will limit the potential for fish entering the lower reservoir. Fish exclusion measures for the Macleay River pump station will follow DPI guidelines.	N/A
DPIF05	The department is supportive of the daily extraction limit of 86.4 ML/day, high flow access above 50th percentile (597 ML at Georges River Junction Gauge), pumping to cease if 30 day steam flows are below the 5 year ARI, and extraction restrictions during first 7 days of first flow event above 50th percentile following an extended dry period or drought. However, it is not clear from the Surface Water Assessment report of what the definition of an extended dry period or drought is that would trigger restrictions on pumping for the first 7 days above the 50th percentile. Special consideration should also be given to implementation of such rules such as cease to pump or restrictions on extraction following extensive bushfires in the catchment which have caused extensive fish kills previously.	SWA updated to further clarify the definition of extended drought conditions and additional controls included to cease pumping under 'special circumstances'.	Appendix E (SWA, Section 5.5.5)
DPIF06	*NSW Biodiversity Offsets Policy: Key Fish Habitat & Aquatic Offsets.* The EIS and Aquatic Ecology Report contains very little discussion regarding the loss of Key Fish Habitat and whether an Aquatic Biodiversity Offsets Strategy is required to ensure a minimum 2:1 offset for impacted Type 1-3 Key Fish Habitats. Quantification using GIS, map or aerial photographs of the direct loss and alienation of Key Fish Habitat within Fingerboard Crossing Creek and the Macleay River water intake should be undertaken as per steps outlined within the NSW Biodiversity Offsets Policy for Major Projects, Fact Sheet -Aquatic Biodiversity (http://www.environment.nsw.gov.au/resources/biodiversity/14817aqoffs.pdf).	Assessment and quantification of impacts to Key Fish Habitat has been completed and provided within an Addendum AEIA provided with the Amendment Report. Opportunities exist for offsets on-site and these will be further investigated by the proponent as part of further discussion with DPI Fisheries on offsetting requirements.	AEIA Addendum (see Amendment Report)
DPIF07	DPI Fisheries policy advocates the use of terrestrial buffer zones as per the *Policy and Guidelines for Fish Habitat Conservation and Management* (Update 2013) available on the Department's website at http://www.dpi.nsw.gov.au/fisheries/habitat/publications/policies,-guidelines-and-manuals/fishhabitat- conservation which states that "NSW DPI will generally require riparian buffer zones to be established and maintained for developments or activities in or adjacent to TYPE 1 or 2 habitats or CLASS 1-3 waterways." The department anticipate that adequate riparian buffer zones will be maintained adjacent to the watercourses as part of this project. Construction footprints for roads adjacent to the Macleay River should ideally provide for 100 m riparian buffer zones, particularly given the topography of this region.	A review of riparian buffer zones has been completed and provided within an Addendum AEIA provided with the Amendment Report.	AEIA Addendum (see Amendment Report)

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
DPIF08	The EIS makes reference to a safety exclusion zone surrounding the Macleay River pumping facility and intake for the safety of river users. Considering the importance of the Macleay River for recreational fishers, particularly targeting freshwater bass, DPI Fisheries anticipate that safety exclusion zones within the river are only in place during the construction of the intake facility, and that open public access for watercraft and fishers along the length of the river past the water intake facility will be maintained during the operational phase of the project.	Safety exclusion zones are needed to protect the pumping facility at any time needed for operation as well as during construction. Engagement with Crown Lands and DPI Fisheries will be carried out during detailed design as part of the preparation of project management plans prior to construction.	N/A
DPIF09	As raised within the EIS, DPI Fisheries would like to see further sampling of areas of potential aquatic habitats of Southern Purple Spotted Gudgeon, *Mogurnda Adspersa*, that are likely to be directly or indirectly impacted upon just prior to construction activities.	A commitment is made to carry out further sampling for Southern Purple Spotted Gudgeon prior to construction.	Appendix C (AE01; AE15)
DPIF10	Baseline monitoring of aquatic biodiversity (including fish diversity, abundance and habitat monitoring), surface water impacts, stormwater and water quality and geomorphology (particularly below the lower reservoir) should be undertaken prior to, during and after construction and operation to allow for the establishment of an adaptive management framework that ensures project specific management plans are in place to mitigate potential impacts resulting from this development.	Baseline monitoring commenced in August 2021 and is ongoing. A commitment is made to conduct ongoing monitoring through construction and operation of the Project. Additional baseline assessment will be undertaken before construction, during and after construction to monitor for change and identify impacts. A monitoring and management plan will be drafted to confirm monitoring requirements and actions as required by the project before construction commences. This will include but not be limited to: • survey effort • locations of survey sites • screen maintenance investigation • corrective actions.	Appendix C(AE15)

5.8 EPA NSW

A submission was received from the NSW Environment Protection Authority (EPA). The submission and responses have been summarised in Table 5.6 and lists where these have been addressed.

Table 5.6 EPA comments and responses

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
Greenhouse gas			
EPA01	Provide annual scope 1 and scope 2 emissions for the life of the project (2029–2050) and describe how these emissions will be minimised, especially in the first 5 years.	Annual time series of Scope 1, Scope 2 and Scope 3 emissions for the project have been calculated for both the construction period (taken to be 2025 to 2029) and the operational period (taken to be 2030 to 2050).	Section 5.8.1
EPA02	Provide the annual emissions savings by avoiding peak gas fired generation (to produce the equivalent electricity as the project).	The emission saving for the Project associated with avoiding peak gas-fired generation would vary depending on (i) the amount of gas-generated electricity (MWh/y) and (ii) the emission intensity of gas generation (t-CO2-e/MWh). The calculation of the emission saving for the Project was completed and showed the saving increased from around 460 kt CO2-e/y in 2029 to around 520 kt CO2-e/y in 2034 and beyond.	Section 5.8.2
EPA03	Describe how climate forecasting for the region has been considered in the design and construction of the project.	Climate forecasting has been considered as part of the Project's design and development of water extraction and pumping rules. A Climate Change Risk Assessment (CCRA) has been completed and provided with this Submissions Report that identifies further consideration for the Project's construction and operation that could be investigated further as part of detailed design to improve climate resilience.	Appendix H (CCRA).
EPA04	The EIS discussed adaptation measures, however provided little background on the Climate Change Risk Assessment used to inform these measures. Please provide a Climate Change Risk Assessment for the proposal that considers risks for both the construction and operational phases of the project and how they will be mitigated.	A Climate Change Risk Assessment has been completed and provided with this Submissions Report.	Appendix H (CCRA).
EPA05	Describe how emissions will be minimised during construction, including Scope 3 emissions and a description of how the materials used will reduce Scope 3 emissions.	Additional information is provided with management of Scope 3 emissions.	Section 5.8.3

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
Noise			
EPA1	The proposal is a greenfield project in a rural area, any exceedances of NMLs will potentially impact receivers. Given there are predicted exceedances for both R2 and R27 further information is required to demonstrate all R&F mitigation measures that will be put in place to manage any exceedances in NMLs. For noise resulting from construction road traffic, all feasible and reasonable mitigation measures should be mentioned in the EIS, to manage noise during more sensitive periods of time.	Noise modelling confirms that construction noise received at assessment locations R2 and R27 is due to construction traffic on the Northern transmission access tracks. Given the location of these residences, the surrounding terrain and the transient nature of these noise sources (i.e. intermittent light and heavy vehicles), it is difficult to apply appropriate mitigation strategies and/or controls that would provide noise mitigation benefits in a cost-effective manner.	N/A
EPA2	The EIS noted "construction and operation of the Project will be 24/7 and 365 days per year", however the Noise and vibration impact assessment developed by EEM states that a strong justification would typically be required for works outside the recommended standard hours. Further information is required to support work being undertaken 24/7. This information should include the proposed works to occur outside of standard construction hours.	The justification for 24/7 construction works includes: • The Project would be constructed in a shorter period of time, thereby reducing amenity impacts brought about by a longer construction schedule. This will also reduce the period of time that noise, air quality, or access impacts specific to a particular location would be experienced. • Workers would be at paid penalty rates, providing them with a higher disposable income which, in turn, would inject more money into the local economy. • Certain activities require large volumes of concrete to be poured and take place from late Spring through Summer. Concrete pouring may not be feasible during the core construction hours, due to high temperatures which can cause thermal issues during the concrete curing process. • The overall reduction in the construction timeframe would provide a cost saving to the proponent. • The project construction environmental management plan (CEMP) would include measures to minimise any potential impacts of construction activities outside of standard work hours.	N/A

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
Waste			
EPA3	The EIS states that certain vegetation will be composted or mulched, with controlled burning considered in some cases. It is important to consider the *Waste Avoidance and Resource Recovery Act 2001* and the waste hierarchy, which prioritise the efficient use of resources. Given these considerations, the EPA does not encourage or support burning of vegetation as there are higher-priority alternatives for utilising this vegetation.	This is noted by the proponent and this will be included in the Waste Management subplan of the CEMP.	N/A
Water & Groundwater			
EPA4	Please provide a discharge impact assessment for all groundwater/process water discharges [including listed EPA requirements].	A discharge impact assessment has been completed for the construction phase of the Project.	Appendix E (SWA, Attachment C)
EPA4.1	Please provide further groundwater information on the Project's strategies to manage spoil and enhance any new landforms created is required. The level of assessment provided in the EIS is not proportional to the significance of the impact.	An updated landform design and geochemistry assessment has been completed following the re-design of permanent spoil emplacement areas as part of the amended project.	Appendix D (Permanent Spoil Emplacement) and Appendix G (Geochemistry Assessment)
EPA4.2	There are no baseline groundwater monitoring bores within the vicinities of the proposed soil emplacement areas. Comparisons of infiltrated leachate to baseline groundwater quality cannot be determined as a result of the spatial limitations with the existing monitoring network. It is recommended that further shallow monitoring locations are installed downgradient of proposed spoil emplacements.	An updated GIA has been completed and presents the updated groundwater monitoring network.	Appendix F (GIA)
EPA 4.3(a)	Please provide a more succinct comparison table for all sampled groundwater quality events, with details regarding the adopted guidelines used for comparison is requested. This will enable a more thorough analysis of the variability of naturally occurring leachable metals across the site.	An updated GIA has been completed with the requested information.	Appendix F (GIA)
EPA5	For the EPA to complete its assessment of the proposal, the proponent must: a) Review inconsistencies between the Surface Water and Geochemistry Reports and if applicable, undertake geochemical/leachability tests. b) Use updated data to develop suitable procedures for handling, storing, treating and disposing of excavated materials and inform the emplacement areas discharge impact assessments. c) Outline mitigation measures and contingencies to be put in place to manage runoff and potential pollution from excavated material yet to be classified. d) Identify the testing frequency for excavated material prior to emplacement. e) Provide further details regarding the management of spoil seepage, particularly the detection of metalliferous rock drainage, its prevention, and capture is requested.	An updated geochemistry impact assessment has been completed following the re-design of permanent spoil emplacement areas as part of the amended project. This report is provided with the Amendment Report. The SWA has been updated to include further assessment on the water quality risks associated with subaqueous emplacements. A discharge impact assessment has been completed for the construction phase of the Project.	Appendix E (SWA, Attachment C), Appendix G (Geochemistry Assessment)

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
	f) Consider and assess any potential risks and impact to receiving waters for all pollutants at non-trivial levels from the rock/spoil emplacements. If any potential impacts are identified appropriate management and mitigation measures should be proposed. g) Develop Trigger Action Response Plan(s) [including EPA listed requirements]. h) Provide further information on the water quality risks associated with subaqueous emplacement of spoil to demonstrate that the water pollution risks to the Macleay River will be appropriately managed [including EPA listed requirements].		
EPA6	Please provide a discharge impact assessment for all wastewater discharges [including EPA listed requirements].	A discharge impact assessment has been completed for the construction phase of the Project.	Appendix E (SWA, Attachment C)
EPA7	Please provide further details and commitments on the erosion and sediment control approaches with reference to practices and principles of Volume 2 of the Managing Urban Stormwater series and other industry best practice.	Erosion and sediment controls measures for all Project disturbance areas were described in detail in the LSEA (Appendix P of the EIS) and are reflected in the mitigation measures. Further details on stormwater specific erosion and sediment control measures have been included in the discharge impact assessment.	Appendix C (Updated Mitigation Measures) Appendix E (SWA, Attachment C)
EPA8	Please provide further details on the criteria used to determine whether a sediment basin 'is not feasible', and where if so, provide additional details of alternative erosion and soil measures proposed (such as undersized basins which can be transferred to larger basins).	SWA updated to provide additional details on sediment basin design criteria.	Appendix E (SWA)
EPA9	Please provide further details of the soil and erosion control measures proposed for each access track and transmission tower pylon in the study area.	Erosion and sediment controls measures for all Project disturbance areas were described in detail in the LSEA (Appendix P of the EIS), and are reflected in the updated mitigation measures to ensure SWMPs and ESCPs prepared for each site include access and construction of transmission towers.	Appendix C (Updated Mitigation Measures)
EPA10	Please provide a discharge impact assessment for all pollutants that may be present at non-trivial levels for each sediment basin [including EPA listed requirements].	A discharge impact assessment has been completed for the construction phase of the Project.	Appendix E (SWA, Attachment C)
EPA11	If proposing Site Specific Trigger Values (such as for aluminium and iron) please ensure they are developed consistent with the ANZECC (2000) guidelines including the selection of an appropriate reference site, and the collection of 24 months of contiguous data.	Site specific trigger values are not currently proposed. The requirement to use site specific trigger values will be established as part of the Project Soil and Water Management Plan.	Appendix E (SWA, Chapter 9)

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
EPA12	Please provide a surface water quality monitoring program [addressing listed EPA requirements] .	SWA includes an indicative surface water quality monitoring program. A detailed surface water quality monitoring program will be developed as part of the Project Soil and Water Management Plan.	Appendix E (SWA, Chapter 9),

5.8.1 Greenhouse gas emissions (EPA01)

Annual time series of Scope 1, Scope 2 and Scope 3 emissions for the Project have been calculated for both the construction period (taken to be 2025 to 2029) and the operational period (taken to be 2030 to 2050). Inputs to the calculations are given in Table 5.7.

Table 5.7 GHG calculation inputs

Parameter	Value
Construction	
Diesel use (general construction) (kL)	29,000
Diesel use (material transport) (kL)	125.9
Vegetation clearing (tonnes)	100,633
Aggregate (t)	169,000
Sand (t)	135,200
Steel (t)	2,764
Vegetation burnt (t)	74,888
Operation	
Emergency diesel use (L)	100
Electricity (MWh/y)	445,000

The calculated GHG construction and operation emissions are shown in Table 5.8 and Table 5.12, respectively.

The emission sources were as follows:

- Construction:
  - Diesel use during general construction activities (Scope 1 and Scope 3). The calculation took into account the approximate staging of the construction of the upper and lower reservoirs, and the underground components of the project.
  - The loss of a carbon sink as vegetation is cleared. The calculation took into account the loss of the carbon sink over the five years of construction (Scope 1).
  - The transport of construction materials (cement and sand) to the project site, and the transport of aggregate, streel, and concrete within the site (Scope 3).
  - Embodied emissions from the use of aggregate, cement, and steel (Scope 3).

- Burning of vegetation during the construction period (Scope 3).

- Operation:
  - Emergency diesel use (Scope 1 and Scope 3).
  - Electricity consumption (Scope 2). This was based on a net electricity consumption of 445,000 MWh per year (i.e. 2,022,000 MWh/year purchased from the grid minus 1,577,000 MWh/year supplied to the grid).
  - The Scope 3 emission factor for electricity the operational period was zero.

Table 5.8 Annual GHG emissions during construction period

Year	Scope 1 (t CO_2-e/y)		Scope 3 (t CO_2-e/y)				All scopes (t CO_2-e/y)
	Diesel use (general construction)	Vegetation clearing (loss of C-sink)	Diesel use (general construction)	Diesel use (material transport)	Embodied emissions	Vegetation disposal	
2025	2,716	20,127	668	12	8,510	109	32,141
2026	10,865	20,127	2,671	47	8,510	109	42,329
2027	24,447	20,127	6,010	106	8,510	109	59,308
2028	21,730	20,127	5,342	94	8,510	109	55,912
2029	19,014	20,127	4,674	83	8,510	109	52,517

5.8.2 Emissions savings (EPA02)

The emission saving for the Project associated with avoiding peak gas-fired generation would vary depending on:

i. the amount of gas-generated electricity (MWh/y)

ii. the emission intensity of gas generation (t-CO_2-e/MWh).

To simplify the calculation, the following assumptions were made:

- It was assumed that all the electricity provided by the Project to the grid (1,577,000 MWh/y) would be used to avoid peak gas-fired generation.

- The emission intensity of gas generation would be 0.52 t-CO_2-e/MWh for Scope 1 and Scope 2 combined. This value was taken from the EIS for the Hunter Power Project (Jacobs 2021)[1]. The Hunter Power Project is designed to be a 'peak load' gas-fired power station, supplying electricity at short notice when there is a requirement in the National Electricity Market (NEM). It was assumed to be representative of the emission intensity of peak gas-fired generation. In fact, its emission intensity was found to be lower than that of similar gas power stations (0.53–0.69 t-CO_2-e/MWh), which suggests that the savings calculated here could be conservative.

The calculation of the emission saving for the Project is shown in Table 5.9. The saving increased from around 780 kt CO_2-e/y in 2030 to around 805 kt CO_2-e/y in 2035 and beyond.

[1] The emission intensity is given in Table 5.15 of Jacobs (2021).

Table 5.9 Calculation of GHG emission saving

Year	Electricity supplied to grid (MWh/y) [A]	Project (Scope 1+2)		Gas (Scope 1+2)	Emission saving (tCO_2-e/y) [A] x ([D] - [C])
		GHG emissions (tCO_2-e/y) [B]	Emission intensity (tCO_2-e/MWh) [C] = [B]/[A]	Emission intensity (tCO_2-e/MWh) [D]	
2030	1,577,000	40,050	0.03	0.52	779,990
2031	1,577,000	26,700	0.02	0.52	793,340
2032	1,577,000	8,900	0.01	0.52	811,140
2033	1,577,000	8,900	0.01	0.52	811,140
2034	1,577,000	8,900	0.01	0.52	811,140
2035	1,577,000	13,350	0.01	0.52	806,690
2036	1,577,000	13,350	0.01	0.52	806,690
2037	1,577,000	13,350	0.01	0.52	806,690
2038	1,577,000	13,350	0.01	0.52	806,690
2039	1,577,000	13,350	0.01	0.52	806,690
2040	1,577,000	13,350	0.01	0.52	806,690
2041	1,577,000	13,350	0.01	0.52	806,690
2042	1,577,000	13,350	0.01	0.52	806,690
2043	1,577,000	13,350	0.01	0.52	806,690
2044	1,577,000	13,350	0.01	0.52	806,690
2045	1,577,000	13,350	0.01	0.52	806,690
2046	1,577,000	13,350	0.01	0.52	806,690
2047	1,577,000	13,350	0.01	0.52	806,690

Year	Electricity supplied to grid (MWh/y) [A]	Project (Scope 1+2)		Gas (Scope 1+2)	Emission saving (tCO_2-e/y) [A] x ([D] - [C])
		GHG emissions (tCO_2-e/y) [B]	Emission intensity (tCO_2-e/MWh) [C] = [B]/[A]	Emission intensity (tCO_2-e/MWh) [D]	
2048	1,577,000	13,350	0.01	0.52	806,690
2049	1,577,000	13,350	0.01	0.52	806,690
2050	1,577,000	13,350	0.01	0.52	806,690

5.8.3 Management of emissions (EPA05)

The mitigation measures focus on the most significant GHG emission sources during construction. Based on the current calculations, these are:

- Removal of carbon sink (vegetation clearing) (Scope 1) – 38% of all-scope emissions in 2029.
- Diesel use (Scope 1 and 2) – 45% of all-scope emissions in 2029.
- Embodied emissions (Scope 3) – 16% of all-scope emissions in 2029.

There is no electricity use during construction.

Table 5.10 GHG emission management measures (project construction)

Measure	Proposed for the project	Detail, comment or justification
Removal of carbon sink and disposal of vegetation		
Rehabilitation/ planting	Yes	Rehabilitation of areas disturbed during pre-construction and construction will be undertaken progressively during all stages and phases of the Project. Progressive rehabilitation will occur over about 60 ha, including spoil emplacement areas and areas used for construction ancillary facilities no longer needed during operation. At the end of the Project's life, 192 ha in total will be rehabilitated to native ecosystem (including native vegetation and rock landscape). Approximately 138 ha will be retained permanently for the water storages and access roads, subject to agreement with relevant landowners/land managers.
Disposal of vegetation	Yes	Encouraging reuse of removed vegetation/trees to avoid decomposition or burning (e.g. construction materials).
Diesel use in vehicles and equipment		
Procurement	Yes	Consideration of fuel efficiency during procurement of vehicles and equipment.
	Yes	Investigate purchase of electric vehicles and equipment to reduce or eliminate on-site diesel use.
	Yes	Investigate the feasibility of installing and utilising energy-efficient technologies, such as the use of LED lights on fixed plant and buildings, and energy-efficient pumps. The proponent has considered the feasibility of variable speed drivers and at this location, variable speed drivers would not provide significant benefit over fixed speed drivers with regard to design and construction requirements, scheme efficiency and cost. Variable speed drivers would require further and more complex underground works (and subsequent surface impacts) at greater cost, and would not significantly increase scheme efficiency to balance these other key aspects.
Maintenance	Yes	Maintenance of vehicles and equipment according to manufacturers' specifications to optimise fuel consumption.
	Yes	Performing pre-start inspections at each shift on mobile plant and vehicles.
Operation	Yes	Haul distances will be minimised as far as practicable to reduce diesel consumption.
	Yes	Review of extraction practices to minimise double handling of materials and associated diesel combustion.
	Yes	Haul roads will be routinely maintained to reduce truck tyre rolling resistance.

Measure	Proposed for the project	Detail, comment or justification
	Yes	Idling of diesel vehicles and equipment will be minimised wherever feasible.
Embodied emissions		
Raw materials	Yes	Procurement of low carbon alternatives where viable (e.g. use of lower carbon cement alternatives).
	Yes	Sourcing materials from local sources where possible.
Other measures		
On-site renewable energy	Yes	Installation of on-site renewable energy source (e.g. solar) to supplement diesel use for powering equipment (e.g. pumps) where possible.
Refrigerants	Yes	Use of refrigerants with a low (or zero) global warming potential where possible at accommodation camp.
Training	Yes	Education and signage to encourage energy efficiency at accommodation camp.
Motion detectors	Yes	Where possible use of motion detectors for lighting in common areas of the accommodation camp.

The mitigation measures focus on the most significant operational GHG emission sources are. Based on the current calculations, these are:

- removal of carbon sink (vegetation clearing): 56% of all-scope emissions in 2029
- electricity consumption: 44% of all-scope emissions in 2029.

Decomposition of vegetation is not currently included in calcs. Diesel use is negligible, although some general principles can be carried over from the construction phase.

Table 5.11 GHG emission management measures (project operation)

Measure	Proposed for the project	Detail, comment or justification
Electricity consumption		
Use of renewable grid electricity	Yes	Pumped hydro is intended to utilise intermittent renewable energy in order to provide power during peak demand periods, as well provide resilience and stability to the grid. Consequently, the electricity required for the scheme is expected to come from renewable energy sources (although there may some times where other sources of electricity are required to support the grid).
On-site renewable energy	Yes	Where possible, installation of on-site renewable energy source (e.g. solar) to supplement renewable grid electricity for powering equipment (e.g. pumps).
Tracking electricity and fuel usage.	Yes	Electricity and fuel usage will be tracked on a regular basis.

Table 5.12 Annual GHG emissions during operational period

Year	Scope 1 (t CO_2-e/y)	Scope 2 (t CO_2-e/y)	Scope 3 (t CO_2-e/y)	All scope (t CO_2-e/y)
	Diesel use (emergency)	Electricity consumption	Diesel use (emergency)	
2030	0.067	40,050	0.067	40,050
2031	0.067	26,700	0.067	26,700
2032	0.067	8,900	0.067	8,900
2033	0.067	8,900	0.067	8,900
2034	0.067	8,900	0.067	8,900
2035	0.067	13,350	0.067	13,350
2036	0.067	13,350	0.067	13,350
2037	0.067	13,350	0.067	13,350
2038	0.067	13,350	0.067	13,350
2039	0.067	13,350	0.067	13,350
2040	0.067	13,350	0.067	13,350
2041	0.067	13,350	0.067	13,350
2042	0.067	13,350	0.067	13,350
2043	0.067	13,350	0.067	13,350
2044	0.067	13,350	0.067	13,350
2045	0.067	13,350	0.067	13,350
2046	0.067	13,350	0.067	13,350
2047	0.067	13,350	0.067	13,350
2048	0.067	13,350	0.067	13,350
2049	0.067	13,350	0.067	13,350
2050	0.067	13,350	0.067	13,350

5.9 Fire and Rescue NSW

A submission was received from Fire and Rescue NSW (FRNSW), however it did not contain comments or recommendations for consideration. It was noted that should information be provided at a later stage to suggest the development is deemed to pose special problems of firefighting or special hazards exist that require additional fire safety and measures, FRNSW may recommend a Fire Safety Study.

5.10 Heritage Council of NSW

A submission was received from the Heritage Council of NSW. The comments are largely recommendations which have been considered by the proponent and will be included in the appropriate management plans to be provided to the Secretary for approval prior to construction.

Table 5.13 Response to issues raised by Heritage Council

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
HC01	The assessment outcomes are broadly supported; however inconsistencies in the assessment of impacts and proposed management and mitigation measures need to be resolved, as noted above.	A review has been completed and updates to the mitigation measures for the Project have been completed as part of this Submissions Report.	Appendix C (Updated Mitigation Measures)
HC02	Provide clear descriptions of the proposed management and mitigation measures across the Project area, and for known heritage sites, commensurate with the results of the significance and impact assessments.	A review has been completed and updates to the mitigation measures for the Project have been completed as part of this Submissions Report to include Heritage Council recommendations.	Appendix C (Updated Mitigation Measures)
HC03	Provide clear mapping of the proposed management and mitigation measures to be undertaken at all relevant locations across the Project area.	A review has been completed and updates to the mitigation measures for the Project have been completed as part of this Submissions Report to include Heritage Council recommendations.	Appendix C (Updated Mitigation Measures)
HC04	Provide clear mapping of any proposed buffer zones/no-go areas.	A review has been completed and updates to the mitigation measures for the Project have been completed as part of this Submissions Report to include Heritage Council recommendations.	Appendix C (Updated Mitigation Measures)
HC05	Management of any potential structures or relics within relevant areas that could not be assessed due to the high level of the Macleay River needs to be considered.	A review has been completed and updates to the mitigation measures for the Project have been completed as part of this Submissions Report to include Heritage Council recommendations.	Appendix C (Updated Mitigation Measures)
HC06	Consideration should be made of the intangible Aboriginal cultural values associated with the historical cultural landscape, and how any impacts resulting from the Project may be mitigated.	An Addendum ACHA has been prepared and provided with the Amendment Report. The Addendum ACHA considers intangible Aboriginal cultural values with Georges Junction. No direct impacts are proposed however further consideration of a cultural values mitigation strategy has been presented.	Addendum ACHA
HC07	The proposed CHMP should include triggers and hold points for redesign to avoid impacts to significant archaeological relics or heritage items that may be identified.	A review has been completed and updates to the mitigation measures for the Project have been completed as part of this Submissions Report to include Heritage Council recommendations.	Appendix C (Updated Mitigation Measures)
HC08	Given the potential for State significant archaeology associated with the early squatting phase, the applicant is encouraged to start the preparation of a risk matrix now, to assist with planning for the management of these potential finds. In particular, the applicant should consider how any such finds may affect the project timeline and budget through potential test excavation, design modifications or salvage requirements. By considering the risks associated with these potential finds now, possible future timeframe and budget pressures can be alleviated by factoring them into project planning and design refinements.	The proponent is soon commencing an ECI process which will include review of all mitigation practices to be completed prior to construction, such that they can be factored into the detailed design, project planning and scheduling.	N/A

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
HC09	As Kunderang East Pastoral Station is also listed as a local heritage item, advice should be sought from the relevant local council.	Consultation with local Council has been ongoing and it is anticipated advice would be sought on any matters relevant as part of the preparation of the relevant Project construction environmental plans, including as part of the preparation of the heritage management plan for any specific measures to be considered for Kunderang East Pastoral Station.	N/A

5.11 Heritage NSW

An Addendum to the ACHA has been prepared which assesses changes to the Project. As such, the Addendum ACHA is provided as an appendix to the Amendment Report. The Addendum ACHA also addresses comments received by Heritage NSW. The submission and our responses have been considered and summarised in Table 5.14 and lists where these have been addressed in the Addendum ACHA. The ACHA is only appended to the Amendment Report (and not the Submissions Report) because of its size and complexity. As such, the table below provides an indication of whether the issue raised has been responded to and how, with the further detail to be found in the Addendum ACHA, as appended to the Amendment Report.

Table 5.14 Response to issues raised by Heritage NSW

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
HNSW01 a)	Please provide evidence of provision of both versions of the draft assessment methodologies (as dated November 2021 and February 2022) to all 19 Registered Aboriginal Parties.	EMM provided a copy of the draft assessment methodology for the Project in an email to all Project Registered Aboriginal Parties (RAPs) on 11 November 2021 and 2 February 2022. A copy of these emails and a list of recipients is located in Appendix C.	Addendum ACHA
1b)	Please provide evidence that the draft ACHAR was provided to all Registered Aboriginal Parties (such as an email with all relevant email addresses shown).	EMM sent the Project draft ACHA report to all RAPs on 25 November 2022. A copy of this email with a list of recipients is provided in Appendix C.6.	Addendum ACHA
2.	Please provide a summary of any consultation that has been undertaken since December 2022, noting that under our guidelines, breaks in consultation of over six months may not constitute continuous consultation.	Following the last documented consultation event recorded in the ACHA on 23 December 2022, a Project update email was provided by EMM to all Project RAPs on 24 January 2023 and again on 1 May 2023. Further details on the communication between EMM and the Project RAPs during this period are recorded in the consultation log within Appendix B. Due to the break in communication for over 6 months with the Project RAPs, the consultation was restarted on 11 March 2024 (Appendix C).	Addendum ACHA

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
3.	The ACHAR references the completion of cultural values mapping; however it is understood that the report is subject to finalisation. Heritage NSW require that a copy of Appendix D be provided for review, noting that if gender restrictions are specified in the cultural values mapping, an assessments officer of the appropriate gender only will review the report. Additional clarifications may be sought once the cultural values mapping report has been provided.	The Cultural Values mapping was in draft at the time of submission of the EIS. Currently it is not proposed to complete that version because of the passing of key people involved. However, the sites raised by knowledge holders as part of the draft within the Project area are all also known via other sources and so have been addressed in the assessment. Further, the proponent is currently exploring completing a new cultural values mapping exercise that is broader and includes other knowledge holders.	N/A
4.	The ACHAR recommends that the ACHMP should include provisions for ongoing consultation to discuss any potential indirect or visual impacts of the proposal on the areas of identified cultural value, being Kunderang East Station (OMPS-CS3), Lower Creek/Long Flat Station (OMPS-CS5) and Georges Creek Camp (OMPSCS4). Heritage NSW recommends that these meetings and discussions occur prior to project approval, to provide accurate information on the nature of any such impacts.	The LVIA concluded that the Project will have negligible to moderate landscape character impacts. Although the visual landscape will be altered due to the Project, the design of the development and location of infrastructure has evolved in order to minimise visual and landscape impacts where possible. Visual impacts were assessed from ten representative viewpoints at residences, main roadways and visitor destinations near the Project, including the National Trail, East Kunderang Homestead and Mary's View lookout. East Kunderang Homestead, located in the OWRNP, is predicted to have no views of the Project and therefore a nil visual impact. The ACHMP will include provision for ongoing consultation which can include indirect effects.	N/A
5.	Lower Creek/Long Flat Station is recognised as having Aboriginal cultural value and potential but is identified as being subject to indirect impact only. However, the consideration of historical heritage provided in Chapter 6.5 of the EIS identifies that the project may directly impact archaeological resources related to Long Flat Station. Please clarify the potential for these archaeological resources to have Aboriginal cultural value and provide information on how impacts to these deposits will be managed with reference to Aboriginal cultural heritage.	Despite similar names the ACHA and SoHI report are referencing two different locations. In the case of the ACHA, references to Lower Creek relate to an alluvial flat or terrace (currently named 'Lower Creek' on modern maps), which was within the broader Long Flat Station that encompassed several hundred hectares of this locale. The use of both identifiers is to provide further spatial context for Lower Creek, which is a very generic term across NSW. This site is situated outside the Project area on the western side of Macleay River. In the case of the SoHI, references to Long Flat Station specifically relate to a historical homestead that is within the Project area on the eastern side of the Macleay River.	Addendum ACHA

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
6.	The Registered Aboriginal Parties have identified significant concerns regarding the importance of maintaining cultural flows within the Macleay River, both more generally and in relation to specific sites/places of cultural value. The ACHAR proposes that this will be further considered as part of water licensing processes. Please clarify why this cannot occur as part of the current assessment process.	The amendments to the Project have included an updated Surface Water Assessment (SWA) which is appended to this report (Appendix E). This includes analysis of water take, licensing and water quality issues. The water licensing framework is designed to take account of water availability and stream health. It is proposed however that ongoing consultation with the community include specific information with regard to the water licensing system and the results of the SWA.	Addendum ACHA
7.	The ACHAR notes the presence of a 'significant part of the cultural landscape biographies of the Aboriginal women connected to Kunderang', being a travel route between the Georges Creek Camp and Kunderang Station. Please confirm how the potential impacts of the proposal on this portion of the cultural landscape have been considered.	This is acknowledged and will be part of the ACHMP and the proponents ongoing work of consultation with the community.	N/A
8.	The ACHAR identifies that an escarpment is present within the project area but was not surveyed due to safety concerns. Please clarify whether this escarpment is within the construction envelope and, if so, whether there is potential to undertake survey of this area with a team with the appropriate level of physical fitness.	This area was surveyed in the site works undertaken in June 2024. No items of cultural interest or sensitivity were identified, and these results are provided in the updated ACHA.	Addendum ACHA
9.	Please confirm that the survey transects shown in Figure 7.1 represent pedestrian survey. If these transects reflect a mix of pedestrian and vehicle survey, please adjust the figure to distinguish each of these survey methods.	No vehicle transects were presented and all transects were pedestrian survey. This is provided in the updated ACHA.	Addendum ACHA
10.	The mapping of survey effort shows an unsurveyed area on the construction envelope to the north-east of the intersection with Waterloo Creek. Given that the adjoining surveyed areas contain a relatively high distribution of artefact scatters/isolated artefacts, please confirm if there is an intention to survey this area, potentially in association with the finalisation of test excavations.	This area could not be surveyed originally due to inundation. The recent survey included this area, and the results are provided in the updated ACHA.	Addendum ACHA
11.	The ACHAR does not include mapping of specific landforms within the project area. The mapping and definition of landforms across the project area is critical given that the acknowledged association between landform and the distribution of archaeological sites and deposits. To comply with Requirement 2 of the Code of Practice, please provide landform mapping using standard classifications, preferably referencing landform units as defined in the 'Landform' chapter of the Australian Soil and Land Survey Field Handbook (3rd edition).	This is provided in the Addendum ACHA.	Addendum ACHA
12.	The ACHAR identifies that some planned test pits were 'discounted' on the basis that there were situated in areas considered to have low archaeological potential. In presenting the test excavation results, please provide clear explanation for the final distribution of test pits with reference to considerations of archaeological potential.	This is provided in the Addendum ACHA.	Addendum ACHA

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
13.	It is understood that approximately 25% of the planned test excavation program could not be completed due to weather and access conditions. Heritage NSW strongly supports the recommendation in the ACHAR that the remainder of test excavation be completed prior to project approval in order to inform final consideration of harm to Aboriginal objects. This is particularly applicable to the eastern portion of the construction envelope, which is also identified as having the potential to contain deeper alluvial soils. The results of these test excavations will inform final consideration of the adequacy of proposed mitigation measures.	The remaining archaeological excavations were completed in May 2024. The results of these excavations are comparable with the data in the EIS ACHA and identified a single further small area of foci in the vicinity of Georges Junction. The remaining test pits were generally culturally sterile or contained very low densities of stone artefacts. Despite predictions of deeper alluvial soil profile being present, none of this additional test excavation found such deposits. The soil profile was generally consistent across the Project area, and consisted of shallow duplex and fabric contrast soil profiles.	Addendum ACHA
14.	The ACHAR states that test excavation was focused on elevated landforms (mainly spurs and crests) associated with the Macleay River and that limited test excavation was undertaken in the areas of moderate to steep relief associated with the proposed reservoir locations and no test excavation was undertaken in the elevated northern portion of the construction envelope. Given this, please justify the basis for extrapolating the results of test excavation to assess the entirety of the construction envelope as comprising low density artefact scatter. The response should consider the landforms across the construction envelope and the site density data by landform presented for the survey in Table 7.2.	Additional test excavations have now been carried out on both the upper reservoir and the remaining construction envelope of the EAR. These all consistently show very low densities of cultural materials with very infrequent small locales of repeated visitation and/or occupation. While these test pits focussed on elevated landforms near Macleay River, they now also include a range of slopes, upper slopes and ridge tops across the Project area, and provide a more holistic view of the distribution of cultural materials; and which remains largely unchanged from the EIS ACHA. In the case of extremely steep slopes, there is extensive data that erosion such as soil creep and mass movement results in skeletal soils and cultural materials eroding downslope. As such, the identification of low densities of cultural materials in these locations can be considered a conservative modelling for these landforms.	Addendum ACHA
15.	Please provide a table correlating recorded sites and test pits with identified focal areas.	This is provided in the Addendum ACHA.	Addendum ACHA
16.	The ACHAR identifies that three recorded sites will be inundated as a result of the proposal but specifies that this will not result in any loss of value. Please clarify this statement with reference to the potential impacts to sites of this type from increased water movement, changes to site context and potential impacts on site accessibility.	This statement has been reviewed noting that sites within the footprint of the reservoirs will result in a direct loss. Further assessment is provided in the Addendum ACHA.	Addendum ACHA

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
17.	The ACHAR identifies that six potential culturally modified trees and three potential stone arrangements will be subject to complete harm from the project, with indirect harm (through inundation) to a potential quarry site, potential stone arrangement and potential grinding groove. It is noted that the Registered Aboriginal Parties identified one tentatively recorded site subject to direct impact (OMPS-SA6) as possibly being associated with a burial. The ACHAR must confirm the status of these sites (as either Aboriginal cultural sites or not) and appropriately assess their significance to inform Heritage NSW's consideration of project impacts. Consideration should also be given to clarifying the status of other tentatively identified sites that are located outside the construction envelope however this may occur following project approval.	Additional desktop and on-Country investigations of these sites have now been undertaken. This has included a specialised arboriculturist inspection of potential culturally modified trees, and further desktop review of stone arrangements (shape, size, location, etc) in the region to provide comparison with the cultural assemblage of the Project area. This has resulted in the formalisation and/or declassification of these sites, and which is presented further in the ACHA addendum.	Addendum ACHA
18.	The ACHAR includes a recommendation that consideration should be given to optimising design to avoid harm to the identified sites. Please provide further information on the timing of this consideration and the likelihood of site avoidance.	This continues to be a focus as the design progresses. For example, the location of the temporary Western Access Bridge has been designed to be located approximately 600 m north-east of Georges Junction to avoid as far as possible the cultural sensitives at that location.	N/A
19.	The ACHAR states that 'the current and proposed impacts of the Project and associated material culture loss, can be considered to have significant benefits.' Heritage NSW does not support this conclusion as harm to Aboriginal cultural heritage from the proposal is irreversible. The benefits referenced in the ACHAR are mitigatory only.	This section has been revised in the Addendum ACHA.	Addendum ACHA
20.	An indicative methodology for further investigation and salvage of the identified foci subject to harm (as may be applied to OMPS-FA1-4 and 8-12) is provided. It is understood that a detailed methodology has not been provided pending design finalisation. Please clarify whether this detail will be available prior to project approval.	This has been provided in an appendix to the Addendum ACHA.	Addendum ACHA
21.	The detailed methodology will be developed on the basis that the sites subject to salvage have moderate significance. Heritage NSW recommends that the methodology should include a requirement that, where salvage excavation indicates that a site has a level of significance higher than that considered in the ACHAR, salvage excavation will be paused until additional consultation is undertaken with the Registered Aboriginal Parties and Heritage NSW to determine whether salvage should continue, should be modified or whether the significance is such that the site or portion of the site should be avoided.	This has been provided in an appendix to the Addendum ACHA.	Addendum ACHA

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
22.	Specific methodologies for the archival recording and proposed management of scarred trees, stone arrangements and quarry sites subject to harm by the proposal should be provided to Heritage NSW to review the adequacy of any such mitigation works. Given that work will be undertaken to confirm the status of these sites, the methodologies (if required) must be developed for all sites identified as valid.	This has been provided in an appendix to the Addendum ACHA.	Addendum ACHA
23.	Correspondence with Heritage NSW dated 28 June 2022 states that artefacts located on key access tracks would be moved off the access track but remain in the general vicinity of the identified location (generally no more than 15 metres from its current location). However, the ACHAR indicates that artefacts were collected and subject to several different storage options including temporary storage in a locked box attached to a tree, placement in the vicinity of an identified landmark and potentially storage in another location on site. Please clarify if any additional consultation was undertaken with Heritage NSW and the Registered Aboriginal Parties in relation to this apparent change in the agreed methodology.	EMM can confirm that some artefacts that were going to be impacted by vehicles on the track were moved. This was undertaken in consultation with the RAPs who were in attendance at the time and the approach agreed was to keep the artefacts on country in a secure location, with only one RAP in disagreement. Heritage NSW was notified of the approach, so the artefacts were stored securely where they remain until the risk of impact is ended. The intention is to remove them and re-locate them to a location agreed between the RAPs and this is a subject for ongoing consultation. This is also discussed further in the updated ACHA.	Addendum ACHA
24.	The AHIMS searches provided in Appendix E are over 12 months old. Please undertaken an updated AHIMS search and confirm that there are no additional sites recorded within or immediately adjacent to the project area that require inclusion in the ACHAR.	A new AHIMS search has been undertaken for the Project, and is presented in the ACHA addendum. The only additional information in this search from the EIS ACHA are the sites recorded as part of the Project.	Addendum ACHA
25.	Based on a review of AHIMS, a portion of the sites identified during the ACHAR have been registered on AHIMS. Please provide a table listing sites by name, AHIMS ID and site type for ease of comparison.	This is provided in the updated ACHA.	Addendum ACHA
	Kunderang East Pastoral Station (listed on the SHR as having significant Aboriginal cultural values) is located within the World Heritage and National Heritage listed GRA but is outside of the project area. The World and National Heritage Impact Assessment report has assessed that the Project will not result in visual impacts to Kunderang East Pastoral Station. However, the ACHAR identifies that additional consideration of potential indirect and visual impacts to this site is required. Any revised visual impact assessment for Kunderang East Pastoral Station may subsequently need to be considered in the World and National Heritage impact assessment.	The project amendments have not resulted in any changes to the LVIA.	N/A

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
	It is recommended that advice be sought from the Australian Government's Department of Climate Change, Energy, the Environment and Water (DCCEEW) regarding all Commonwealth matters of national environmental significance.	This issue relates to the East Kunderang Pastoral Station that is southwest and outside the Project area. The EIS ACHA indicated that there may be some potential indirect (visual) impacts to this homestead. However, a formal visual impact assessment undertaken as part of the EIS concluded that there would be 'no predicted visual impacts'. As such, it is considered there would be no impacts to this site, and therefore no requirement to consider further under the *Environmental Protection and Biodiversity Conservation Act 1999*.	Addendum ACHA

5.12 Mining, Exploration and Geoscience (MEG)

A submission was received from Mining, Exploration and Geoscience (MEG). However, it did not contain comments or recommendations for consideration.

5.13 NSW Rural Fire Service

A submission was received from NSW Rural Fire Service (RFS) and noted the isolation of the site and that internal roads will be constrained by topographical features. RFS requested a site visit to permit the proponent to verify the recommendations of the bushfire assessment.

Consultation with RFS was undertaken during the preparation of the EIS, and as noted in the submission by RFS a site inspection has been discussed. Since exhibition of the EIS, the proponent has met with RFS to discuss their submission and comments on the Project, and to further the site inspection. It was agreed a site inspection via helicopter is preferred and arrangements were made on multiple occasions between October 2023 and March 2024. However, each planned site inspection was ultimately postponed due to bushfire events and RFS availability, or poor weather conditions.

Consultation with RFS is ongoing and the proponent is committed to ensuring arrangement for a RFS site inspection will occur and any feedback is incorporated into the Project's Bushfire Emergency and Evacuation Management Plan (as described in Appendix C Updated Mitigation Measures).

5.14 Transport for NSW

An Addendum to the Traffic Impact Assessment (TIA) has been prepared which assesses changes to the Project. As such, the Addendum TIA is provided as an appendix to the Amendment Report. The Addendum TIA also addresses comments received from Transport for NSW (TfNSW).

TfNSW provided a letter during the preparation of the EIS dated 24 July 2023 with several comments for the traffic assessment to consider. At this time, the assessment was largely complete and as such the feedback was not able to be incorporated prior to exhibition of the EIS. TfNSW has provided a submission dated 12 October 2023 that provides comments on traffic related matters and has included reference to the July correspondence noting that some of these initial comments have been updated following review of the EIS.

TfNSW comments and the Project's responses are provided in Table 5.15.

Table 5.15 TfNSW comments and responses

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
Letter provided 24 July 2023			
Access			
TfNSW01 (1.1)	Table 1.4 in the TIA (ARC comments and EMM responses) states that the three access points to the development will be in accordance with Austroads and Council standards and Section 2.4 states that the design of the three access road intersections adjoining Kempsey Armidale Road have been prepared in consultation with Councils and TfNSW. Section 6.7 also refers to the options for bridge crossings over the Macleay River to access the site. TfNSW has not reviewed any proposed designs for any access points servicing the development to date. These need to be submitted as part of the TIA.	The Kempsey Armidale Road will be upgraded by jointly Kempsey Shire Council and Armidale Regional Councils where the funding is provided by OMPS. The respective council will liaise with TfNSW in relation to Kempsey Armidale Road upgrade and the Project site accesses.	Section 4.1.1 and 6.3.3
Route assessment			
TfNSW02 (1.2)	Section 6.5 of the TIA states OSOM deliveries will be from the Newcastle or Brisbane port to the site via Kempsey. A route assessment is required from Brisbane to the site if deliveries are also to arrive from Brisbane. The route assessment is to include at a minimum the following:	The OSOM delivery will occur from Port of Newcastle. There will not be any OSOM delivery from Port of Brisbane.	N/A
TfNSW03 (1.2a)	• Identify the OSOM route to be utilised and any indicative pinch points within the network vertically, horizontally and laterally and the potential civil works required to accommodate the OSOM vehicles.	Road upgrade required due to the OSOM deliveries will be incorporated as part of Kempsey Armidale Road upgrade. No road or infrastructure upgrade will be required as part of the OSOM travelling along TfNSW controlled arterial roads. Some on-street parking may be affected but respective councils will be contacted by the OSOM operator if there is any loss of parking in any of the public roads. All information will be incorporated in the application to NHVR as part of the approval of the OSOM vehicles.	N/A
TfNSW04 1.2b)	• The logistics assessment is to highlight each at-risk road structures that the haulage route crosses including bridges, traffic signals, signage, major culverts, and minor culverts that may not meet the desirable cover to cater for proposed axle loads.	The Project will not require any upgrade of any traffic signals. In relation to culvert, bridge, pavement upgrade of Kempsey Armidale Rood, these will be incorporated as part of upgrade of this road. Some of the provisional KAR bridge assessment comments are provided in Section 5.14.1.	Section 5.14.1

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
TfNSW05 (1.2c)	• Pull-over bay locations for the design vehicle and associated swept path analysis and identification of any long haulage segments of the route where overtaking cannot be achieved.	The distance between Port of Newcastle and Frederickton is approximately 300 km. It is understood that this entire length can be done by one night. Hence, no pull over bay will be required at this section of the haulage route. From Frederickton to the site is approximately 100 km. Despite the reduced distance of this section of the haulage route, some pull over bays may be required due to challenging topography and winding nature of Kempsey Armidale Road. Any required pull over bays on Kempsey Armidale Road will be finalised based on the consultation of council's road design engineers and OSOM vehicle operator. Any particular pull over location/s will be outlined in the application to NHVR.	N/A
TfNSW06 (1.2d)	• The design vehicle templates used with the swept path analysis software are also requested in order for TfNSW to review the performance within the software (e.g. Autodesk Vehicle Tracking or Transoft AutoTURN).	As part of the road design, appropriate turning software (Autodesk Vehicle Tracking) has been used.	N/A
TfNSW07 (1.2e)	• Provide the following measurements parameters of the OSOM components/materials to be moved: – Identify all the types of OSOM vehicles proposed to be used for the project. – Overall combination length, width, height and mass. – Maximum component length. – Maximum component widths. – Maximum load heights (clearance to overhead obstructions such as structures, utilities and vegetation). – Wheelbase dimensions. – Maximum trailer articulation angle(s). – Minimum overhang heights above the road surface. – Axle loads and axle group loads in terms of both tonnes and Equivalent Standard Axles (refer to *Austroads Guide to Pavement Technology*).	A smaller OSOM vehicle to that proposed in the EIS has been selected. The parameters for this vehicle is provided in section 5.14.2.	Section 5.14.2
TfNSW08 (1.3)	Section 6.5 of the TIA refers to a concept design report for the necessary road upgrades to facilitate OSOM movements following the results of the OSOM route assessment, this needs to be submitted with the TIA for review in conjunction with the route assessment.	As stated earlier, the respective councils will liaise with TfNSW in relation to Kempsey Armidale Road upgrade to facilitate the OSOM vehicles.	N/A

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
TfNSW09 (1.4)	The OSOM route study report findings, Table 6.7 of the TIA refers to bridges, pipes and culverts which would need to be checked for capacity, such assessments need to form part of the TIA. To understand the capabilities of the bridges on the classified road network a route assessment is required that is supported by bridge assessments. For the classified road network the bridge assessment request would need to be submitted to spu@transport.nsw.gov.au with details of the vehicle combinations (including axle spacing, ground contact width, number of tyres and requested axle group mass) and identifying the bridges along the classified road network for the specified route(s). Separate assessments for any other third-party bridge assets along the OSOM route would be required in addition to the above assessments. The process for the bridge assessments would need to be sought separately by the relevant third party (i.e. local councils and Rail Infrastructure Managers).	No bridge/culvert will be affected between the section Port of Newcastle and Frederickton. Any bridge and culvert upgrade along Kempsey Armidale Road due to the OSOM movement will be incorporated in the Kempsey Armidale Road upgrade by the respective councils.	N/A
TfNSW10 (1.5)	Section 6.2 of the TIA suggests construction vehicles will travel to the site via Armidale, clarification is required on the number and type of vehicles proposed to use this route along with a route assessment determining if the largest vehicle proposed can utilise this route.	Heavy vehicles associated with the construction of the temporary bridge over Macleay River will use the Waterfall Way/Kempsey Armidale Road intersection for maximum two to three months period. The largest vehicle type will be 19 m long semi-trailer, 19 m long semi with dolly (bridge girders), Prime Mover with Low loader (maximum Trailer Width 3.4 m, steerable axles). Project related light vehicles may use this intersection for up to 12 months. Other project related heavy vehicles will travel from Kempsey. The majority of the workers will reside in the accommodation village and will not require to travel to the worksite on daily basis.	N/A
TfNSW11 (1.6)	Section 6.2 of the TIA suggests all construction traffic will arrive from either Kempsey or Armidale, clarification is required if vehicles will be required to travel from any other locations (apart from OSOM vehicles).	Construction traffic will arrive either from Kempsey or Armidale, with the majority coming from Kempsey.	Section 4.1.1
TfNSW12 (1.7)	Table 8.1 of the TIA identifies that the intersection of Waterfall Way and Kempsey-Armidale Road does not have SISD in accordance with Austroads. TfNSW does not support intensifying the use of an intersection without compliant SISD. The turn treatment at the intersection of Waterfall Way/Kempsey-Armidale Road is also not compliant due to a short deceleration lane and decreased storage due to the proximity of an existing bridge. This needs to be addressed.	As stated earlier, the Waterfall Way/Kempsey Armidale Road intersection will be used for maximum two to three months for transporting materials for the temporary bridge over Macleay River. As it is a temporary work, temporary traffic management is proposed which will be documented in the amended traffic report.	N/A

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
Traffic analysis			
TfNSW13 (1.8)	Section 1.9 of the TIA states that the estimated traffic volumes and timelines may change, following selection of the construction contractor and completion of the detailed design phase. A worst-case scenario is required within the TIA to ensure any works required along the proposed routes are considered within the scope of works to ensure that the development is constructable.	Since preparation of the original TIA, the traffic volumes have changed slightly. An addendum to the TIA will outline the updated traffic volumes and which will be based on a worst-case scenario.	Addendum TIA
TfNSW14 (1.9)	The TIA needs to include details of any proposed ancillary infrastructure to be provided on-site for example, concrete batching facilities, The TIA should identify the source for input materials and quantify the traffic generation associated with the haulage of the source materials. Where the location of source materials is not yet known, worst case scenarios for traffic distribution of those materials to and from the development site are to be addressed.	The estimated traffic volumes have considered all ancillary infrastructure e.g. deliveries associated with concrete batching plant, accommodation village etc. The exact locations of the source materials are yet to be confirmed but the traffic estimation has considered transportation of the source materials.	N/A
TfNSW15 (1.10)	Section 5.5 of the TIA states considerable queuing was observed during the peak hours on the Macleay Valley Way bridge and along Lord Street and suggests it is unlikely the congestion will increase as a result of the project as the preferred route is via Macleay Valley Way, Frederickton. However, Section 6.2 indicates light vehicles will pass through the township i.e. using Lord Street, Smith Street, Macleay Valley Way, Second Lane, North Street, River Street to access the development. Clarification is required on the following: • The proposed routes, traffic volumes utilising the routes and proposed measures to mitigate the impacts of intensifying the use of the key intersections along the route. • The proposed measures to ensure that vehicles use Macleay Valley Way, Frederickton instead of passing through the township?	In the revised traffic distribution, there will not be any light or heavy vehicle through the Kempsey township e.g. Smith Street/Belgrave Street signalised intersection. All light and heavy vehicles to/from the south will use the Kempsey bypass via Frederickton e.g. Macleay Valley Way – Second Lane, therefore, no impact to Macleay Valley Way bridge or Lord Street.	N/A

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
TfNSW16 (1.11)	The TIA states that shuttle bus size will be determined based on demand and pick up and drop off locations are still to be determined. Further details are required addressing the following points: • How a commitment to the use of shuttle buses will be made and what measures will be in place to ensure the number of vehicle movements on the external road network does not exceed the proposed volumes. • Pick up and drop off locations, size of buses to be used and the number of employees to use them. • Identify if the shuttle buses will be located at the project area during the day or return to another location outside of the AM/PM peak hours. • Details of the accommodation capacity, work schedules relevant to staff turnover and peak shift change/staff turn over details. • How the commitment will be achieved through protocols, monitoring and breach to commitment procedures being developed.	The majority of the peak 822 construction workers will be residing in the accommodation village. Workers residing in the accommodation village will be Day In Day Out (DIDO) or Fly In Fly Out (FIFO) workers travelling to/from the accommodation village at the beginning or end of the shifts outside the peak traffic hours. Despite the location of the accommodation village is yet to be confirmed, the estimated traffic volumes (shuttle bus) between the village and worksite are considered in the traffic assessment. All construction workers are required to use the shuttle bus between the accommodation village and the worksite, with the exception of some local workers who are required to drive from time to time e.g. utes with equipment. The pick-up and drop off locations of the shuttle bus will be at the accommodation village and the worksite which will be detailed in the site plans. The shuttle bus will operate throughout the day, at the beginning and end of the shifts. As it is a 24X7 construction project, the workers will be rostered in two to three shifts in 24 hours. Hence, the shuttle bus would require travelling throughout the day, predominantly during the off-peak hours, given that each shift will be approximately 8 to 12 hours. The shuttle bus protocols, monitoring and breach of commitment will be documented in the management plan, to be prepared as per the development consent.	N/A
TfNSW17 (1.12)	The TIA states that the key intersections identified in Section 5.3 have been modelled using SIDRA. Electronic copies of the SIDRA files need to be submitted with the TIA for review.	Electronic copy of the SIDRA files will be submitted to TfNSW, as part of the TIA Addendum provided with the Amendment Report.	N/A

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
Letter provided 12 October 2023			
TfNSW18 (2.1)	The Waterfall Way/Kempsey Armidale Road intersection will require the installation of signage to mitigate risks from increased traffic volumes. A sign to warn of the upcoming intersection to the west of the bridge over Chandler River for eastbound traffic and on the approach to Kempsey Road for westbound traffic will need to be installed. A stop sign is to be provided for Kempsey Armidale Road northbound. This will be a condition of consent.	The necessary warning sign will be provided in Waterfall Way for the eastbound vehicles. Stop signage will be provided in Kempsey Armidale Road at Waterfall Way intersection. A signage plan has been prepared as part of the TIA Addendum.	TIA Addendum
TfNSW19 (2.2)	The TIA (see Table 6.2 and Table 6.3) does not appear to have accounted for service/delivery vehicles that will service the on-site accommodation, which is expected to house over 600 workers during peak construction. Construction will take four to five years, which means that service/delivery vehicles are likely to account for a substantial number of trips if they are required.	The estimated traffic volumes include all service deliveries e.g. water delivery, waste collection, loading deliveries etc for the maximum 600 capacity accommodation village.	N/A
TfNSW20 (2.3)	The TIA fails to identify the maximum height of the OSOM vehicle and laden loads. TfNSW notes that Section 6.5 identifies the length and width of the design vehicle that was used in the swept path assessment, and the height of the loads (250 MVA 3 phase transformer and turbine top) only.	The maximum height of the laden load will be 4.5 m.	N/A
TfNSW21 (2.4)	The swept path assessment contained in the Route Study by Rex J Andrews needs to be undertaken using AutoTURN software or similar. TfNSW would be particularly interested in the swept path assessment of the Pacific Highway/Macleay Valley Way intersection at Frederickton.	For the road design, relevant turning software will be used. The screenshot of the swept path assessment at Pacific Highway/Macleay Valley Way intersection is provided below: 	N/A
TfNSW22 (2.5)	Clarify if the TIA includes the calculation of the heavy vehicles that require NHVR permit but are exempt from escort requirements within the AM/PM peak hour during the peak of construction.	The OSOM assessment includes all escort and non-escort vehicles. Only escort vehicles will require NHVR's approval.	N/A
TfNSW23 (2.6)	Provide an update for the TIA that the AM/PM peaks have been measured on a single trip from origin to destination as a one-way vehicular movement from one point to another excluding the return journey.	Due to the remote nature of the site, the return journey is unlikely to occur in the same hour. Therefore, the traffic is estimated based on the one-way movement in any specific peak hour.	N/A

Identifier	Issue/recommendation	Response summary	Reference where issue is addressed
Additional comments			
TfNSW24 (2.7)	TfNSW notes that Kempsey Armidale Road is still a local road under the care and responsibility of Council. Kempsey Armidale Road is a windy road with unsealed sections and varying road widths. An assessment of the pinch points of this road in relation to the proposed Oversize Overmass (OSOM) vehicles will need to be forwarded for Council to review.	As stated earlier, the Kempsey Armidale Road will be upgraded by jointly Kempsey Shire Council and Armidale Regional Councils where the funding is provided by OMPS.	N/A
TfNSW25 (2.8)	The rail line through Kempsey is managed by ARTC, as noted in the TIA. The EIS needs to be referred to ARTC separately for comment if this has not been done so.	This is noted by the proponent and discussion with ARTC will be undertaken on an ongoing basis. It's noted that the rail crossing utilised by OSOM vehicle do not require any upgrade or other works and so consultation will be undertaken to ensure that OSOM movements and passenger and freight movements do not impact each other.	N/A

5.14.1 Bridge assessments (TfNSW03)

The table below provides the preliminary bridge assessments along relevant sections of the Kempsey Armidale Road. Any works required for these bridges would be part of the works undertaken by Council (as funded by OMPS Pty Ltd) and so are not assessed further.

Table 5.16 Bridge assessments

Bridge	Comment
Deep Creek	Precast concrete desk units with type F concrete barrier. Acceptable if designed to AS5100.2 SM 1600 Design loads.
Mungay Creek	New bridge under construction in March 2010 Google street view. Precast concrete girders with W-beam barriers. Acceptable if designed to AS5100.2 SM 1600 Design loads.
Lewis Creek	Culvert with W-beam railing. Difficult to estimate age or likely capacity. Will require to assess further.
Devils Nook Creek	New bridge under construction in March 2010 Google street view. Acceptable if designed to AS5100.2 SM 1600 Design loads.
Midnight Creek	A short bridge over deep gully, old style concrete bridge railings, possibly built in the 1960s – 1970s and have potential capacity issues to platform loads.
Nulla Nulla Creek	New bridge under construction in March 2010 Google street view. Acceptable if designed to AS5100.2 SM 1600 Design loads.
Pee Dee Creek	Concrete bridge, looks like replacement steel railings, possibly built in the 1960–1970s and have potential capacity issues to platform loads.
Five Day Creek	New bridge evident in 2008 street view. Half height concrete and twin steel railings. Acceptable if designed to AS5100.2 SM 1600 Design loads.
Blackbird Flat Creek	A short bridge over deep gully, old style concrete bridge railings, possibly built in the 1960–1970s and have potential capacity issues to platform loads.
Lagoon Creek	New bridge under construction in March 2010 Google street view. Precast concrete girders with W-beam barriers. Acceptable if designed to AS5100.2 SM 1600 Design loads.

5.14.2 OSOM parameters (TfNSW07)

The initial OSOM report provided with the EIS was compiled by Rex J Andrews (2022) was based on a conservative assumption around a design vehicle (shown in Figure 5.3). The selected design vehicle was utilised to complete swept and tracking path analysis as part the OSOM report, as this was the information available at the time.

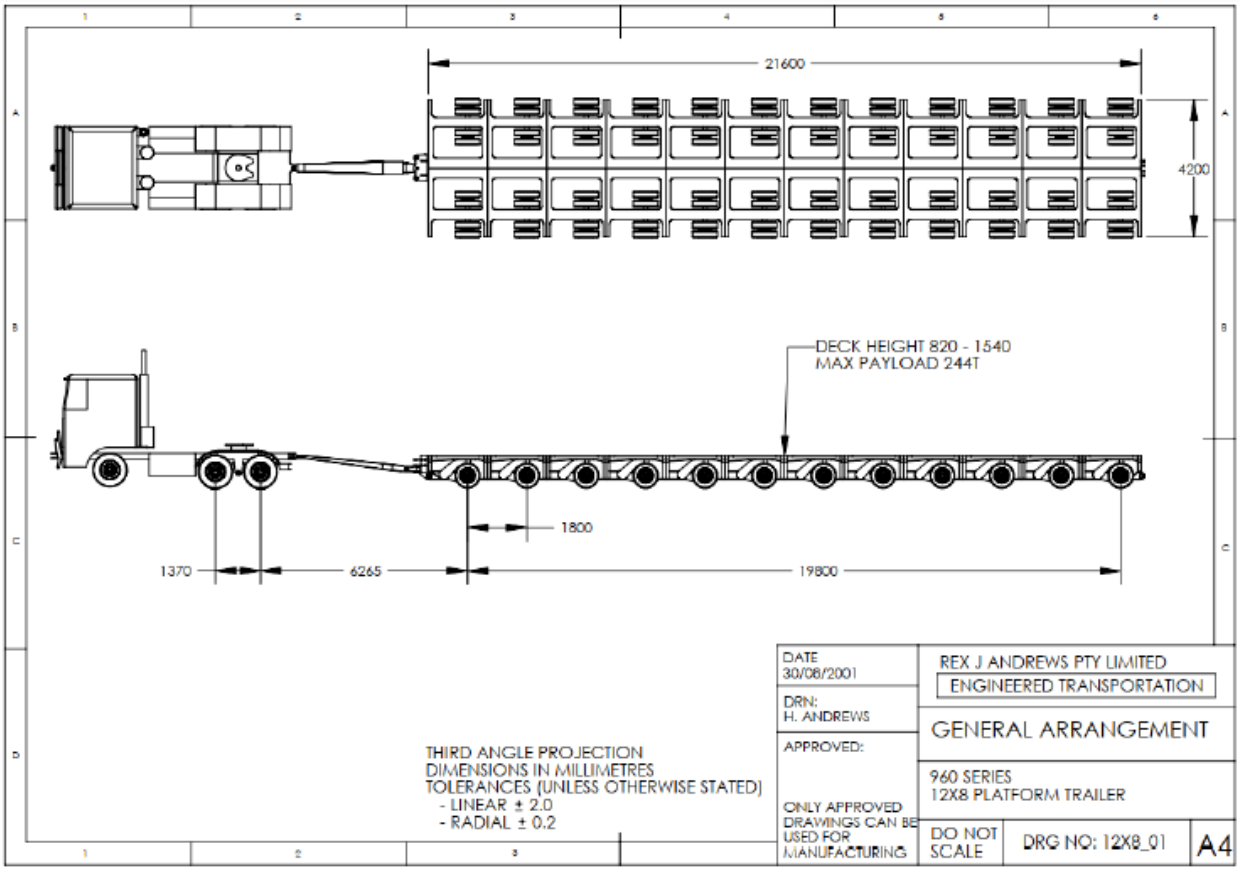

Figure 5.3 Indicative OSOM vehicle (EIS) specifications

The proponent has since engaged an Original Equipment Manufacturer (OEM) to provide an updated list of OSOM components and sizes. This provides more certainty around availability in the market of fit for purpose vehicles and equipment for this project. Based on OSOM load specifications by the OEM on this information, a design vehicle with a smaller swept and tracking path has been selected.

This OSOM vehicle type smaller than that envisaged in the EIS. It has a 3.4 m wide platform trailer and has a steerable rear axle. The technology used on OSOM vehicles has also improved significantly with split steer rear-axles and 3-to-4-point suspension SPMTs (Self-propelled modular transporter) now being a common occurrence to get OSOM loads into sites with constraint access (e.g. Snowy 2.0). This option is currently being further investigated for the Project with positive initial feedback. These vehicles are extremely manoeuvrable, with an option of an electric or mechanical steering, and able to work in terrain with up 8.1 degrees crossfall slopes.

5.15 WaterNSW

A submission was received from WaterNSW, who are responsible for stream flow gauge (ID 206024) on the Macleay River downstream of Georges Junction. WaterNSW's submission focuses on potential impacts to this asset caused by construction activities or traffic. Further, comments regarding the alignment of the transmission line from the generation component to Line 965 and associated towers now proximal to the stream gauge. The following recommendations were raised by WaterNSW:

- WaterNSW requests that access for our staff and contractors to the gauge [Macleay River at D/S Georges Junction] is maintained throughout construction and operation of the Project, and that measures are implemented to ensure the gauge is protected.

- To assist WaterNSW account for any unexpected variations in measurements at our stream flow gauge, we request that the proponent advises us with regards to these issues [potential short-term decrease in surface water volume, flow and quality due to water extraction] when they are occurring or expected to occur.

- WaterNSW requests consideration of the construction of the transmission line towers in the proposed Soil and Water Management Plan as the mitigation measures in Table 9.3 of Appendix P do not currently include the towers.

Consultation with WaterNSW will be undertaken to ensure simultaneous activities can occur safely during the construction period, without restricting access to WaterNSW staff and contractors. During operation, access to the stream flow gauge (ID 206024) would be maintained and simultaneous activities are not expected to impede access to the streamflow gauge.

Update mitigation measures have been prepared as part of this Submissions Report (Appendix C) and have been revised to include consideration of construction of the transmission towers in the Soil and Water Management Plan.

6 Response to organisation and community submissions

6.1 Overview

As presented in Section 2.3, several different matters were raised by organisations and the community. In many instances, several individuals raised the same or similar concerns. All comments and concerns raised by the community were categorised in line with the SSI guidelines as previously described in Section 2.2.1. This section, therefore, provides responses to the issues raised according to category and subcategory, for ease of reference. A detailed Submissions Summary is provided at Appendix A.

6.2 Procedural matters

6.2.1 Accessibility of information

i Quantum of information

- The EIS was a huge document and the time allowed for comment during public exhibition was too short. The exhibition period also included a nationwide referendum that held most of the community's attention and efforts.
- There were issues accessing links and downloading documents from the portal page.
- Confidential, private and/or culturally sensitive information was included in the documentation and then later redacted.

The Project's exhibition period is set by legislation (the EP&A Regulation) and enacted by DPHI. Under the EP&A Regulation, the EIS must be exhibited for a minimum of 28 days. The Project's timeline was established before the announcement of the referendum and in order to uphold the Project's schedule, OMPS submitted the EIS to DPHI to maintain this timeline. It is acknowledged that the Major Projects Website experienced issues during the exhibition period where links and some documents were not available to download. Once these documents and the portal page were restored, the public exhibition period was extended by a further four days to account for these accessibility issues. In total, the EIS was exhibited for 32 days.

The EIS was available 24 hours per day, seven days per week on the Major Projects website throughout the exhibition period and could also be viewed online. Additionally, digital (USB) copies were provided via the Kempsey Project Hub and at several locations in Kempsey and Armidale, and a letterbox drop of the Summary of Findings booklet was also undertaken within the local area.

For those who didn't have time to read the full EIS and appendices, the executive summary provided an overview of the EIS, and each technical report provided an executive summary of the technical aspect addressed. Separate to the Major Project website, an EIS Summary of Findings was also published via the OMPS website.

The Project team has no control over the Major Projects website as the website is run by DPHI. Any issues regarding accessibility of links and document downloads on the website should be addressed to DPHI. Issues accessing the website and downloading documents could also be related to the individual's internet bandwidth, device capabilities and/or device storage space, all of which the Project team has no control over.

The Project team has undertaken community and stakeholder consultation since August 2017, including a Project website, dedicated email address, face-to-face meetings and a dedicated Project hub in Kempsey for the community to drop in and obtain information. Up to date information on the EIS process, preliminary designs, news, notifications, and factsheets, were made available to the public prior to lodgement of the EIS and throughout the exhibition period using these methods.

It is acknowledged that copies of an Appendix were made public and then later redacted. The document had two versions, an unredacted version and a redacted version to restrict confidential, private and/or culturally sensitive information. Regrettably, the unredacted version was erroneously provided to DPHI and uploaded to the portal, and this error was remedied as soon as possible. As noted above, the exhibition period was extended to accommodate some of these accessibility issues.

ii Deferred assessment or management

- The EIS defers many important environmental assessments and management to a later 'detail design phase', including traffic management, erosion and sediment control plan, decommissioning plan, etc which is unacceptable.
- Inadequate consideration has been given to impacts to surface and groundwater and the control and monitoring measures.
- Who is responsible for managing the Company's proposed mitigation strategies and their implementation, including impacts to vegetation and threatened species, groundwater, soil erosion, water testing, waste management etc?
- All relevant regulating 'Departments' need to be sufficiently funded to ensure full assessment and effectively monitor for compliance to protect the community and environment from adverse impacts.

Comprehensive environmental assessments were completed to inform the EIS – they were not deferred to the detailed design phase. The objective of the detailed design process is to optimise the design to meet construction requirements while continuing to minimise environmental impacts. Environmental impacts were assessed for the construction envelope, which is the maximum extent where disturbance may occur during construction of the Project. To derive the construction envelope, buffers were applied to key Project elements and infrastructure. This allows for changes to the detailed design and ensures all land impacted by the Project has been assessed.

Mitigation measures have been proposed for traffic, and erosion and sediment control, however, detailed management plans can't be finalised until the Project design is confirmed for construction and additional specific requirements for the Project (such as conditions of consent) are stipulated. Management plans will be prepared post-approval and tailored to conditions, locations, and Project design at the time of construction to ensure the plans are effective and minimise impacts to the maximum possible extent.

A decommissioning plan has not been developed because the Project is expected to be operational in excess of 100 years. Technology, knowledge, methods, legislation, and needs will likely change significantly over that time, meaning any rehabilitation plan that could be established now may be irrelevant in a century. Final land use and rehabilitation principles have been considered and identified in the Rehabilitation Strategy for the Project, which is a framework to evolve with construction and operation of the Project.

The detailed surface water assessment (SWA) was undertaken in accordance with all the appropriate guidelines and assessed impacts resulting from construction and operation of the Project including streamflow impacts, water quality impacts, operational discharges, water availability, flooding, and geomorphology based on a detailed site water balance, climate and weather patterns, construction and operation activities, and existing flow regime (to name a few). All potential impacts were adequately considered according to the National Water Commission risk framework and management and mitigation measures will be employed to minimise potential impacts, with ongoing monitoring undertaken to validate the effectiveness of those measures.

The detailed groundwater impact assessment (GIA) was undertaken in accordance with all the appropriate guidelines and assessed impacts resulting from construction and operation of the Project including impacts to drawdown, inflow, baseflow and leakage. The GIA considered soils and geology, climate, and area groundwater systems and used predictive water modelling according to Australian Groundwater Modelling Guidelines to predict potential impacts.

The water assessments conclude that although local effects will occur as a result of the Project, the regional effects on catchment surface water flows, catchment water quality and regional groundwater resources are insignificant. Control and monitoring measures are detailed in Table E.1 in Appendix E of the EIS. The table includes who is responsible for each mitigation measure. Control and monitoring of surface and groundwater impacts are the responsibility of OMPS and/or the construction contractor, as detailed in Table E.1. These controls form part of the commitments made by OMPS for the Project and re-affirmed in this Submissions Report as Appendix C (Updated Mitigation Measures).

The mitigation measures provided form the basis of a Construction Environmental Management Plan (CEMP) and sub-plans that manage various elements such as Erosion and Sediment Control Plan, Biodiversity Management Plan and so on. Typically, those plans will be prepared after the completion of the EIS and will be submitted to DPHI for their approval. Those plans then form the basis of the implementation works for the project. This includes the engagement of an Environmental Manager for the Project who will oversee the implementation of the plans. That person would also oversee independent audits of the implementation and ongoing functioning of the mitigation measures.

Funding or ensuring regulating 'Departments' are sufficiently funded to monitor compliance is beyond the scope of the Project and the Proponent's responsibility. However, as part of the lodgement of the Project's Development Application and EIS submission, application fees are paid in accordance with the EP&A Regulation, which ensures assessment of the EIS is fully funded at the expense of the proponent.

6.2.2 Technical approach and/or modelling

- The ACHA investigations were inadequate and rushed, with crucial areas omitted and artefacts removed from site without following proper protocols.
- Geotechnical drilling was undertaken prior to the completion of a full cultural heritage investigation.
- Concern that cultural heritage management plans have not been developed prior to exhibition of the EIS.

The investigations completed for the ACHA followed relevant legislation and guidelines currently in place in NSW. The *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* is the relevant guideline for field investigations and provides for temporary removal of artefacts from site for further analysis, including laboratory testing and dating. Artefacts were collected, labelled and transported in the care of archaeologists and remain with the Project team until consultation with Aboriginal community confirms their management. Options include re burial, museum deposition or to be held by community or other party under a Care Agreement.

Geotechnical drilling for the Project was separately approved by Armidale Regional Council in accordance with Part 4 of the EP&A Act. As part of the development application for the works, an Aboriginal Due Diligence was completed in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* and included survey of the works are with a representative of the Local Aboriginal Land Council.

Consultation with the Aboriginal community is ongoing, including on ensuring appropriate management strategies can be implemented. As such, a detailed cultural management plan has not yet been prepared as part of the EIS. However, OMPS has committed to prepare a plan prior to construction which will ensure no harm to Aboriginal objects, sites or places will occur prior to appropriate management measures being developed and the plan in place. Any management plans to be prepared prior to construction must first be developed in consultation with, or endorsed by, the relevant regulatory authority and are anticipated to be specified in the conditions of consent of the Project.

An Addendum to the ACHA has been prepared in response to the proposed amendments and that report is provided with the Amendment Report which accompanies this Submissions Report. Those updates included a new consultation process which followed the legislation and guidelines. In response to concerns from the Aboriginal community that adequate coverage of appropriate knowledge holders was being achieved, OMPS Pty Ltd engaged GIRA to provide First Nations liaison. With support from GIRA, the updated ACHA included both consultation and survey work as well as test excavation.

Separate to the ACHA which responds to heritage legislation and policy, the proponent, with the aid of GIRA are continuing to engage with the Aboriginal community as outlined in Section 6.2.3ii.

- The EIS relies on outdated climate change predictions and there is uncertainty on whether climate change has been factored into the assessment, noting extreme weather such as drought, fire and flood conditions.

Climate and streamflow records from five flow gauges were used in the surface water assessment, with rainfall records reported as early as 1889 and 1907. This data was used to determine long term average climate for the project. At the time of preparation of the EIS, climate change predictions were based on data from AdaptNSW (OEH 2014) and these predictions are still current for the North Coast region within which the project is located.

The SWA factored climate change into the assessment qualitatively in relation to flooding and quantitatively with regard to the operational water balance. The SWA was updated to respond to feedback from DCCEEW and further clarity is provided on the specific operational regime and cease to pump rules developed to protect the flows of the receiving environment. The water balance model results presented in the updated SWA (Appendix E) indicate operations can maintain 100% generation capacity in all but the driest historical and current climate conditions. The frequency and length of time in which the Project experiences reduced generation capacity are anticipated to increase under a drying climate. The Project sensitivity to potential climate change and adaptation management measures to address climate driven risks will be further investigated as part of the detailed design process.

As part of this Submissions Report, a Climate Change Risk Assessment (CCRA) has been prepared and provided at Appendix H. The CCRA further details the climate trends likely to be faced by the Project and assesses risks to the current design and identifies opportunities for adaptation measures to be incorporated into the future detailed design.

Increased rainfall and runoff intensity, increased bushfire risk, increased drought risk and increased maximum, minimum and daily temperatures and increased prevalence of extreme weather events are all expected to occur within the operational lifetime of the Project. It will be a requirement in the main construction contract to consider the potential for future adverse changes to the climate and weather conditions at the project site. Specifically, the contractor will be required to consider climate change projections published by the NSW Government (via AdaptNSW or equivalent agency) in its design and construction.

- Deferred issues, mitigation and management, such as incomplete surveys, post-construction rehabilitation, decommissioning, and management plans to be completed at a later date.

As noted above, environmental assessments were completed to inform the EIS. Where surveys were still ongoing, these updates are provided with this Submissions Report and/or Amendment Report for review and comment by the community and agencies.

Separate to these assessments, it is normal for the EIS process to continue in stages to allow for detailed design and construction planning to be undertaken. This includes CEMP and sub-plans to be completed by the D&C contractor, many of which will require approval by DPHI prior to construction commencing and the implementation of which will be audited. The preparation of management plans in this manner is a common feature of DPHI's conditions of consent.

In this way, the management plans cannot depart from the requirements outlined in the EIS, unless there is a clear reason to do so, and with the Department's explicit acceptance. In addition, even with project approval, no works can be undertaken until the consent conditions attached to that activity are fulfilled.

6.2.3 Level of engagement

i Adequacy of community engagement

Submissions included comments regarding the level of engagement. Matters raised include:

- Insufficient, if not dishonest, community consultation.
- The community consultation and information available in Armidale was inadequate.
- Genuine community consultation is inadequate as there has been no formal presentations to community in Armidale, Bellbrook, Kempsey. At community meetings in Armidale attended by members of Armidale NPA the meetings were poorly executed with some of the OMPHS staff and even some directors ill informed.
- Drop-in sessions were of no value to the community. The only value to the proponents is the opportunity to tick the boxes, i.e. to state the legal requirements for community consultation are met.

The proponent uses a range of engagement mechanisms to consult with neighbouring property owners, the local community, Federal, State and local government, regulators, service providers, local community groups and aboriginal groups. These engagement mechanisms were used and expanded upon in the stakeholder and community engagement activities carried out to support the Project. Consultation carried out during the Scoping and EIS phases of the Project was in accordance with the consultation requirements set out in the *Undertaking Engagement Guide: Guidance for State Significant Projects (DPIE, November 2021).*

A variety of communication and engagement tools were activated for the Project, as part of promoting inclusive, transparent, structured and meaningful engagement for all identified stakeholders. The tools were designed to provide information about the Project and encourage feedback consistent with the SSI Engagement Guidelines and the SEARs.

OMPS commenced engagement and communication in August 2017 with a series of face-to-face meetings with government stakeholders. Broader consultation activities kicked-off in December 2019, which included liaising with those community members most likely to be interested and/or impacted by the Project. Since early 2020, the Project has sought to engage in an open, ongoing, and accessible manner implementing a diverse range of communication tools to foster project awareness and encourage feedback.

The first Project newsletter was issued in November 2021 and provided a Project overview, including scope of works, road impacts and safety, information about the planning process and EIS field investigations, and an overview of engagement activities. As of May 2024, there have been 12 newsletters published. Newsletters were distributed to a project mailing list (consisting of almost 1,600 recipients) via email, hard copies made available at local venues (including the Project's Community Information Hub) and published on the Project's website (www.ompshydro.com). The newsletters were also shared on the Project's social media channels.

Project engagement was responsive and recognised that the community liked to engage in different ways and at different times. Drop-in style information sessions offered an informal, inclusive, and flexible approach to communicating key information. Sessions were typically between three and four hours in duration, spaced at different times across multiple days, and held at accessible locations where the community could arrive and leave as they saw fit, access up-to-date project information (e.g. maps, fact sheets, and newsletters) and talk directly to the Project team. The Project team informed the community about the exhibition of the EIS via the Project website, Project Facebook and LinkedIn pages, an email to the Project mailing list, and direct emails to key stakeholders. The Project team also prepared an EIS Summary of Findings Booklet which was made available in print and copies left at Kempsey and Armidale councils, Kempsey Library, the Community Information Hub, the Macleay Valley Business Chamber September networking event, Willawarrin Hotel, Willawarrin Post Office, Bellbrook Hotel, and letterbox dropped to landowners in Lower Creek. Digital copies of the booklet were made available to collect on USB and on the Project website, Facebook and LinkedIn.

Community information presentations, drop-in sessions, and regional stalls were held in Kempsey (6), Armidale (5), Walcha (1), Bellbrook (2), Frederickton (1), Willawarrin (1), Hillgrove (1), South West Rocks (1), and Ebor Falls (1). Over the years, the team has also supported and attended the Armidale, Walcha, and Kempsey shows; liaised with local councils, community groups – including the Bicentennial National Trail Board – and education and service providers. OMPS also hosted 'Power Lunches' at the Community Information Hub, offering small group sessions to learn about the project, ask questions, and provide feedback. These sessions, bookable online, included a light lunch and an in-depth presentation of the project.

OMPS presented at the Save Our Macleay River (SOMR) public forum on Saturday, 19 November 2022. The event, planned by SOMR, included various speakers and was moderated by an independent MC. Due to prior commitments, the Project team could not attend the full session and was allocated 10 minutes to present during the two-hour event.

The presentation provided an update on the Environmental Impact Statement (EIS), clarified the project's scope, discussed preliminary community benefit sharing plans, noted upcoming industry participation activities, and highlighted First Nations engagement efforts. 100 information packs containing newsletters and factsheets were distributed. Questions from the audience focused on the EIS's timing and rigour, water management, cultural heritage investigations, and the role of Alinta Energy who subsequently purchased the project. The team acknowledged that not all questions might have been fully addressed but emphasised their commitment to being responsive and accessible.

To facilitate ongoing communication, a toll-free line (1800 518 194), an email address (info@ompshydro.com), a project website (www.ompshydro.com), and a Community Information Hub in Kempsey (2/28 Clyde Street) are available.

Should the project be approved, OMPS Pty Ltd (now owned by Alinta Energy) will continue to develop productive working relationships with the local community by establishing a Community Consultation Group. To demonstrate impartiality towards key stakeholder concerns, an independently chaired Community Consultative Committee will facilitate structured engagement between the Project and Kempsey and Armidale council and community representatives.

To address feedback that the Project was overly reliant on drop-in sessions, OMPS proposes to hold a series of presentations across Kempsey, Armidale, and other smaller communities. These presentations will be conducted in accessible, well-equipped venues to help with participation and engagement. To ensure transparency and thorough communication, OMPS will provide written responses to all questions asked at these community presentations post-event. Additionally, OMPS will offer formal, in-person presentations to groups or organizations upon invitation or request.

ii First Nations engagement

- The engagement with the local Aboriginal community left a lot to be questioned.
- OMPS has consistently failed to hire Thunghutti People, despite the Project being situated within Thunghutti Country.
- OMPS has not provided cultural sensitivity training to its staff, resulting in a work environment that does not respect or understand Indigenous cultural norms and values.
- OMPS has failed to address complaints of discrimination or cultural insensitivity made by Thunghutti Traditional Owners.

Consultation with Aboriginal community for the Project followed the methods prescribed by *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010). This includes pre-notification and notification processes. Ongoing consultation and assessment of the Project has been carried out also in accordance with *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*, including presentation of project information and assessment methodologies, preparation of impact and mitigation strategies and report review. The formal consultation process was supplemented by additional Aboriginal Focus Group (AFG) meetings.

Since the exhibition of the EIS and the course of time that has transpired, the Project team re-initiated the consultation process, following the methods prescribed by *Aboriginal Cultural Heritage Consultation Requirements for Proponents,* as part of this Response to Submissions Report. In addition to this formal consultation process, separate on-Country and First Nations engagement was carried out to identify key knowledge holders and confirm Traditional Owners.

During preparation of the EIS, individuals and organisations registered their interest in the Project during the notification period. The Project team accepted further registrations throughout the Project regardless of when they have become known or identified their interest. Overall, as part of the EIS the Project had been liaising with 19 RAPs organisations and/or individuals since its inception in early September 2021. Some six of these RAP organisations participated in face-to-face meetings, field investigations (survey and test excavations) and interviews with a highly experienced anthropologist to discuss cultural values.

Feedback during the EIS consultation process included extensive discussion on who speaks for Country, who should participate in the on-site activities and how often, understanding the assessment process, and identifying concerns over broader environmental issues. Thungghutti involvement in cultural heritage was dictated by Heritage NSW guidelines and despite large number of registering as RAPs, 7 key Thunggutti representatives were involved in every key stage of the project. Because of the need to include multiple groups and RAP representation on fieldwork, there were limited places available. While the 7 Thunggutti representatives were involved, the broader Thunggutti community members were not engaged for those specific ACHA related works.

Separate to the consultation requirements for the purposes of the ACHA, GIRA has been engaged since the exhibition of the EIS as a First Nations Advisor to assist with development of specific programs and cultural benefits, such as Aboriginal Ranger program, Heal Country initiatives and health, housing and accommodation services. Through on-site engagement and focused discussions with primary stakeholders, GIRA has supported the ACHA process (which is focussed on the prescribed process for that assessment). At the same time, GIRA has undertaken a broader First Nations consultation process to enable community engagement and participation. Since September 2023, this has included:

- 414 hours working within the community (on Country).
- 28 meetings with Project leads and First Nations primary stakeholders.
- 1139 interactions with Project leads and Frist Nations primary stakeholders.

Feedback during the recent Submissions Report consultation process also included extensive discussion on who speaks for Country, who should participate in the on-site activities, and who the key knowledge holders are within the community. This consultation included many individuals and organisations not included previously during the EIS on-site activities in order to achieve equity and fairness across the Project.

While fieldwork spots for the short term ACHA related work has been limited, there is an interest by the community in broader social and economic opportunities for the Project and OMPS and GIRA are engaged in ongoing discussions with community members about how to achieve this.

In partnership with Aboriginal stakeholders, their communities, or nominated representatives, OMPS and GIRA will work collaboratively to co-create a tailored Action Plan. This plan will adhere to the methodologies outlined in the New South Wales Government's Connecting with Country Framework (July 2023), which focuses on benefits sharing, capacity building, economic equity, and excellence throughout the Project's duration. Key components of this plan include the development of an Aboriginal Participation Plan to promote educational and sustainable employment outcomes with an emphasis on equity and excellence. Additionally, an Aboriginal Advisory Group will be established to integrate the voices, knowledge, values, and perspectives of Aboriginal stakeholders, ensuring cultural authority in the responsible management of land, cultural heritage, and land use agreements. The plan will also assess and develop opportunities for Aboriginal and Torres Strait Islander education, employment, supply chain, and procurement to support improved, sustainable economic and social outcomes.

Further engagement strategies to be implemented include the establishment of an Engagement Hub, which will provide multi-channel communication and integrate with social media, webinars, and virtual events. This platform will facilitate engagement with Aboriginal and Torres Strait Islander stakeholders and provide iPads pre-loaded with the Engagement Hub, allowing participants to register and provide feedback with necessary support. Additionally, a Community Information Hub located in Kempsey will offer a face-to-face engagement opportunity, allowing stakeholders to meet the Project team, learn more about the Project, and participate in project planning and studies. Open from Tuesday to Thursday each week, the Community Information Hub will provide up-to-date project information, including maps, newsletters, and factsheets, and will serve as a venue for small community meetings. Face-to-face community consultations will be held locally in response to key topics, complemented by online consultation surveys and collaboration.

6.3 The Project

6.3.1 Design/operation

i Pump infrastructure and operating rules

- Selection of pump location.
- Times and flow rates for pumping should be more limited.
- Water uptake from the Macleay River is a significant concern for both initial filling and for top-up in an increasingly unreliable river flow. The EIS does not specify a measurement for “high flow” in megalitres per hour. Clear definition is needed and included in any licences and approval requirements.
- Maintenance required in planting of vegetation to stabilise erosion caused by cut and fill batters, mainly water in increasingly dry weather.

Extraction of water is needed for construction and operation and the proposed extraction regime is detailed in the SWA (Appendix E).

Construction activities will require a steady source of water at relatively low rates, similar magnitude to extraction rates used for irrigation purposes. Construction water will be sourced from several locations along the Macleay River adjacent to key construction areas.

Greater extraction rates are required for the initial storage fill compared to the rates required for general construction activities. It is proposed to locate the initial storage fill pumps and pipeline on the right (eastern) bank of the Macleay River near the lower dam and reservoir. This location was selected for its suitable depth and proximity to the generation infrastructure.

Access conditions are proposed to limit water take and protect existing downstream users and environmental receptors during dry periods. For example, water will cease to be extracted from the Macleay River for construction purposes when streamflow at the Macleay River at D/S Georges River Junction (206024) gauge is below the Very Low Flow Class’s flow rate of 13 ML/day. To minimise potential impacts to downstream users and environmental receptors, extraction for initial fill purposes will only occur during periods of high flow.

The Macleay Water Sharing Plan does not define high-flow-only access conditions for the Macleay Gorges Water Source but does however define high-flow-only access conditions for the Macleay Valley and Apsley River water sources (refer to Appendix E, Attachment A), where high flow is defined as the 50th percentile streamflow (i.e. the flow that is exceeded on 50% of days). The principles used to define high flow conditions in these other two water sources are considered applicable to the Macleay Gorges Water Source. Hence, the 50th percentile streamflow (597 ML/day) at the Macleay River at D/S Georges River Junction (206024) stream gauge has been used to define the high flow conditions to be applied to the initial storage fill extraction. The definition of high flow is therefore consistent with relevant plans and presented as ML/day, and not ML/hour.

The proposed conditions for extracting water from the Macleay River are provided in Table 6.1 (and as presented in Appendix E, Table 5.2 of SWA).

Table 6.1 Proposed extraction conditions – Macleay River

Water take	Volume required	Estimated extraction period	Cease to pump trigger[1]	Pumping rate[7]	Additional conditions
Construction water	Up to 1,000 ML/year	4–5 years[5]	13 ML/day[2]	2.8 ML/day	• Water must only be taken when there is a visible flow in the water source at the location where water is to be taken.
Initial storage fill	6,250 ML	3–12 months	597 ML/day	Up to 86.4 ML/day (1 m^3/s)	• The 50th percentile streamflow value is to be maintained. • Pumping to cease if 30 day streamflow total[1] below 5 year ARI value of 1,936 ML. • No extraction for first seven days following a flow event greater than 50th percentile streamflow[1] value following extended dry period or drought[3]. • Water must only be taken when there is a visible flow in the water source at the location where water is to be taken. • Consideration of special circumstances[4].
Operational top-up	Up to 130 ML/year[6]	Ongoing	597 ML/day	Up to 86.4 ML/day (1 m^3/s)	• The 50th percentile streamflow value is to be maintained. • Pumping to cease if 30 day streamflow total[1] below 5 year ARI value of 1,936 ML. • No extraction for first seven days following a flow event greater than 50th percentile streamflow[1] value following extended dry period or drought[3]. • Water must only be taken when there is a visible flow in the water source at the location where water is to be taken. • Consideration of special circumstances[4].
			13 ML/day[2]	10% of streamflow	• In accordance with the rules of the Macleay WSP. • Maximum pumping rate of 10% of the observed streamflow in the Macleay River. • Water must only be taken when there is a visible flow in the water source at the location where water is to be taken.

Notes:
1. Streamflow measured at Macleay River at D/S Georges River Junction (206024) stream gauge.
2. 'Very low flow' conditions for the Macleay Gorges Water Source as defined in the Macleay WSP.
3. Extended dry period or drought refers to the 30-day streamflow total below 5-year ARI (1,936 ML) as defined in SWA Section 4.4.2iv.
4. Special circumstances to be assessed on a case-by-case basis with the corresponding protocols to be documented in the SWMP.
5. Construction water will be required until construction of the Project is complete. Construction water may be required for more than the estimated 4-5 years if the construction program experiences delays.
6. The operational top-up volume is based on the water balance modelling described in SWA Section7.2. Actual operational top-up volumes may exceed this value on occasion. OMPS will hold all water entitlements prior to take occurring as described in SWA.
7. All values are based on a constant rate over a 24 hour period.

A Soil and Water Management Plan is proposed to provide the overarching erosion and sediment control measures to be applied to the project. It is acknowledged that the effectiveness of erosion and sediment controls could vary under different climatic conditions, such as increasingly dry weather. The mitigation measures have been updated to ensure management plans provide for monitoring of the effectiveness of control measures such that any risks can be identified and managed.

ii Road design and upgrades

- Road upgrades will be a problem and new bridges would need to withstand the strain of floods.
- Traffic and workers will definitely be coming from Armidale and the road is not suitable.
- The haul road should have an exit road at Georges Junction to minimise traffic as well as OHS aspect.

The proponent has submitted an Amendment Report which includes a newly proposed temporary bridge to allow construction access from the western end of the Eastern Access Road (EAR), referred to as the Western Access Temporary Bridge (WATB). This amendment is proposed to reduce the period of internal road construction and therefore overall construction period, and improve effectiveness of emergency response measures (access and egress).

The Project is currently undertaking further design work on temporary and permanent bridges that it is proposing as part of the Project scope. Specialist bridge and structural designers have been engaged and through this design process there is a substantial amount of design criteria taken into consideration (i.e. flood modelling, natural flows, bridge heights, etc.). A flood study for the Project has been provided with the updated SWA (Appendix E, SWA Attachment D).

Some initial worker traffic will travel from Armidale to site via the WATB over the first 12 months of construction only. After this, all traffic is anticipated to be from Kempsey via the Smiths Bluff access and the EAR. The Kempsey Armidale Road will be upgraded in key sections in both the Armidale LGA and Kempsey LGA to accommodate OSOM and heavy vehicles. Those works will be assessed for environmental and planning approvals by the Councils and the works managed by them, but funded by OMPS Pty Ltd. These processes will be outlined in a Heads of Agreement with each Council (see Section 4.1.1).

iii Geotechnical information

- The amount of drilling seems to be inadequate and indicates a lack of thorough preparation.
- The technologies and challenges of tunnelling at this site with hydrogeological limitations presents too many unknowns, and it's a real scenario that this site could experience similar failures of the Snowy 2 borer getting stuck.

Geotechnical investigations currently planned to be completed prior to the commencement of construction includes boreholes at 21 locations including in situ and laboratory testing, test pits, geophysics and geological mapping. Investigations at 13 of the 21 borehole locations have been completed, including through the power cavern to a drill depth of approximately 830 m, and at the upper dam abutments. Investigations for the remaining planned boreholes are scheduled for completion in Q3 2024, and there is the possibility of additional boreholes to be completed during the tender design phase and early stages of construction.

A number of geotechnical investigation campaigns have been undertaken at the site to inform the scheme design, and the most recent campaign was completed in Q3 2024. To date the following data has been obtained:

- 17 boreholes at the upper dam site
- 13 boreholes at the lower works site
- 1 borehole to 830 m depth to the powerhouse location
- 17 seismic refraction lines
- 190 laboratory tests on core samples recovered
- over 280 discrete test report data points.

In addition to the above, the current investigation will add 8 boreholes at the lower dam and tunnel portal locations, approximately 130 laboratory tests on core samples recovered. There is also the possibility of additional boreholes to be completed during the tender design phase and early stages of construction.

All sites pose their unique geotechnical risks and challenges; the geotechnical investigation program has been designed to inform the design process and manage the risk.

There is no plan to utilise a tunnel boring machine (TBM) for this project, that being the item that has been 'stuck' on the Snowy2.0 project.

6.3.2 Alternative options

Comments raised in submissions were not supportive of the Project's location and PHES as a long-term energy storage. Issues raised included:

- More efficient and cost-effective methods of longer-term storage such as battery technologies.
- site selection and use of a 'brown-field' sites instead.
- EIS does not address alternate sites or technologies.
- Project area is to environmentally sensitive.
- PHES is out of date.
- The Project location has been created rather than best fit.

i Alternative pumped hydro Locations and site sensitivity

OMPS has assessed the pumped hydro energy storage potential of the Project area, considering essential development attributes such as natural terrain, capacity, grid connection, community impact, as well as planning and environmental constraints. The Project area offers ideal conditions for developing an off-river pumped hydro energy storage project and associated infrastructure.

The Project area possesses excellent characteristics for pumped hydro energy storage development, including a significant head height, minimal horizontal reservoir separation, and natural rock formations well-suited to functioning as reservoirs. A concept design study to identify and screen potential options was completed by SMEC in 2019/2020 with the goal of developing a pumped hydro system that is technically sound and economically viable (See EIS Appendix F). A feasibility design was completed by SMEC in 2022, building on both the concept design and site investigations.

A review was performed of ANU's 2017 data set that identified 22,000 potential pumped hydro energy storage sites throughout Australia. An analysis of the 8,578 potential reservoir sites in NSW revealed that only 736 combinations of reservoirs would not require tunnelling in environmentally sensitive regions, would not require the clearing of environmentally sensitive ecosystems for energy transmission purposes, and have hydrological heads[2] of greater than 300 m (as shown in Figure 2.8 and Figure 2.9 of the EIS).

A high hydrological head and a low distance between reservoirs is highly desirable as this combination of traits would allow a pumped hydro energy storage project to have a large capacity for energy storage while also recapturing stored energy efficiently. In these regards, the Project area is one of the most suitable sites identified in NSW by the ANU's data set as it has the highest hydrological head of any site assessed and has among the shortest distance between reservoirs. This analysis confirmed that the Project area contains highly desirable options for the construction of a pumped hydro energy storage scheme relative to the portfolio of other potential greenfield locations. For design options considered within the Project, see Section 2.5.3 of the EIS.

[2] The 'hydrological head' refers to the elevation difference between the upper storage and lower reservoir.

This setting supports the effective construction and operation of a closed-loop or off-river pumped hydro energy storage system. Adjacent to the Macleay River, the Project area facilitates water intake for the initial fill during construction and any operational top-ups required for seepage and evaporation.

Located away from towns and population centres, the Project area features very low population density with only a few sensitive receivers nearby. The location enables the construction of access roads that can easily connect to the major Kempsey-Armidale Road. Additionally, the site allows for the construction of a new electricity transmission network from the generation site to the Lower Creek area, which can be connected to an existing transmission line. The Project area's flexibility in design helps to avoid or minimise impacts where possible. Furthermore, being situated within the New England region, it is well-positioned to contribute to the New England Renewable Energy Zone (REZ) and assist in meeting New South Wales' energy generation and storage requirements. The site is primarily on private land.

This region was selected due to its suitability for large-scale renewable energy production, its proximity to existing electrical infrastructure, and its potential to meet electricity demand in population centres in both New South Wales and Queensland. The compatibility of existing land uses with renewable energy production and the area's topography, which supports the inclusion of pumped hydro-electric projects like this one, were also significant factors in site selection.

Since the project's inception, the aim has been to avoid and minimise environmental impacts as much as possible. Much of the design refinement has focused on continually reducing the project's footprint. This process is ongoing following the exhibition of EIS. As detailed design continues, OMPS and its contractor will persist in seeking ways to minimise the disturbance area wherever feasible.

Due to the nature of the project and the necessary clearing, some impacts on parts of the Project area and its habitats are unavoidable. However, through ongoing design refinements, the project has further minimised the construction footprint and preserved as much of the existing natural environment as is reasonable and feasible. This approach aligns with the broader biodiversity mitigation process of avoiding, minimising, and offsetting impacts. Where impacts are unavoidable, they will be offset in accordance with the Offset Strategy to achieve long-term conservation outcomes. This strategy is expected to be implemented over time and deliver significant benefits for the area's natural values and the communities that depend on it. The Project area selection and layout have been amended to retain biodiversity values and ensure that there are no significantly adverse biophysical, cultural, social, or economic impacts. Areas of higher value native vegetation have been avoided where practical. Significant surveys have been completed across the Project area to ensure that Aboriginal heritage sites have been identified and adverse impacts to any culturally significant areas have been avoided.

ii Alternative energy generation and storage

The National Electricity Market (NEM) requires dispatchable generation and large-scale storage solutions that are cost-effective and strategically located between major load centers. According to the Australian Energy Market Operator (AEMO), the NEM will need the equivalent of eight times the Project to meet future energy demands. The Project stands out as the most cost-effective option for this need compared to other alternatives.

Batteries, when evaluated on a $/MWh storage basis, are significantly more expensive than the Project. They are at least 60 times more costly than the Project and would require multiple replacements over the Project's 100 year design life. In terms of scale, matching the Project's storage capacity with batteries would necessitate the equivalent of 2,700 South Australia big batteries, highlighting the infeasibility of this option for bulk energy storage in the NEM.

Gas plants, while capable of providing megawatts (MW) of capacity, do not offer storage capabilities. Therefore, they cannot support the NEM's need for large-scale energy storage.

In contrast, the Project delivers both capacity and storage. This dual capability allows the Project to stabilize NEM prices by capping price peaks and supporting the integration of new wind and solar energy into the system through firming. By providing reliable and large-scale energy storage, the Project underpins cheaper electricity prices in the NEM and enhances the overall efficiency and stability of the market.

The strength of the NEM has historically been its diversity of generating sources. To maximise competition and minimise consumer costs, future NEM developments should include all economically viable generating sources. In an optimal NEM, the balance between coal, gas, wind, solar, hydro, and other sources is determined by effective competition. OMPS agrees with AEMO's assessment that the NEM requires greater storage capacity than the Project alone can provide.

Large-scale batteries do have a role in the NEM, particularly for services such as frequency control. However, based on the Snowy 2.0 feasibility study, they suffer from prohibitive costs when it comes to delivering the same products and services that the Project offers. There is currently no evidence to suggest that batteries will ever be economically competitive on a large scale.

Alternative storage technologies are further discussed in Section 6.5.2i.

6.3.3 Related projects

Comments were raised in submissions with regard to related developments to the Project, namely:

- Upgrade of transmission lines [Line 965] and the associated design, environmental impacts and property compensation.
- Upgrade of Kempsey Armidale Road, its current usage, and the financial impost on the local Councils.

i Upgrade of Transmission Line 965

At present, Line 965 is a single-circuit 132 kilovolt (kV) electrical transmission line that spans between the population centres of Armidale in New South Wales's (NSW) New England Region and Kempsey in the North Coast Region. The current Project includes a transmission line that connects to Transgrid's Line 965. However, the upgrade of Line 965 from its current 132 kV to 330 kV is not included in the current Project application.

Transgrid would be the proponent for the assessment, feasibility, optioneering, design, construction and operation of Line 965. The environmental assessment and approval for that project will be undertaken by Transgrid.

This is not an unusual approach to major projects with multiple inter-related elements. For example, the Snowy 2.0 project was approved in four parts:

1. Exploratory works (SSI-9208).
2. Segment factory (SSI-10034).
3. Main works (SSI-9687).
4. Transmission connection (SSI-9717).

The proponent for the first three EISs was Snowy Hydro Ltd with the Main Works EIS submitted in 2019 and approved in May 2020. Transgrid were the proponent for the transmission connection EIS which was submitted in February 2021 and approved in September 2022.

Additionally, the Central-West Orana Renewable Energy Zone transmission project (SSI-48323210) includes related development which are subject to separate planning and approval processes which includes upgrade to the existing Transgrid network between Mount Piper and Wallerawang to strengthen the grid in the Central Tablelands.

The reason elements such as these are separated out is for myriad reasons but can include that different elements are controlled by different proponents and that design, engineering and constructability assessments are times differently between different proponent processes.

What this means is that the separate elements are assessed under their own process under the EP&A Act. For Snowy 2.0 that was a separate EIS approved under Part 5 of the EP&A Act. That EIS included all the requirements of applicable legislation and guidelines, as well as the SEARs. The Snowy 2.0 CSSI declaration itemised transmission works and so the EIS was undertaken under the highest level of requirement and scrutiny.

That is the case with the Line 965 works also. Clause 20(2)(b) of Schedule 5 of SEPP (Planning Systems) includes transmission works. This means that any assessment process undertaken by Transgrid will be required to be completed in accordance with Part 5 of the EP&A Act and the Department's guidelines, as well as the SEARs.

Crucially, this separate assessment will include consultation with the community and stakeholders. It would need to take into account visual aspects (including pole choice and design), as well as social and economic concerns. It would also need to take into account cumulative impact assessment, having regard to the impacts represented by the main OMPS project.

This Project cannot estimate or confirm when the assessments for the transmission components will be prepared as that will be a process run by Transgrid. However, when they are prepared, a Scoping Report would be exhibited on the DPHI Major Projects portal prior to the EIS, and a consultation process in accordance with SEARs for that project undertaken.

ii Upgrade of Kempsey Armidale Road

The EIS noted that identified road upgrade works along the KAR for over size over mass (OSOM) vehicles would be subject to separate approvals under the EP&A Act and would be obtained by Armidale Regional Council and Kempsey Shire Council as applicants.

The design and constructability assessment of the project has progressed since this EIS. As such, the proponent confirms that all OSOM will travel to site via Kempsey. No OSOM vehicles will travel along the KAR from the Armidale end.

Both Councils are currently undertaking recovery works along the KAR after the severe weather and flooding events in 2022 with government funding provided under Disaster Recovery Funding (DRF). It is important, therefore, that the works discussed associated with the Project, do not interfere with the funding for those works, nor the timing of them.

The proponent has participated in workshops with both the Armidale Region Council (ARC) and the Kempsey Shire Council (KSC) to work through how best to integrate the OSOM works for the Project with each of the Councils DRF works.

The proponent's engineering team have been working with a number of suppliers and manufacturers of OSOM vehicles to understand constraints of particular vehicles. They have been able to recommend the use of a fit for purpose OSOM vehicle different to that foreseen in the EIS. This new vehicle is similar to the one the Snowy 2.0 project used to navigate their equipment to site through similar terrain constraints. It has a number of steerable axles which allows the vehicle to navigate in tight road widths as detailed below.

The initial OSOM report that was compiled by Rex J Andrews was based on a conservative assumption around a design vehicle. The selected design vehicle was utilised to complete swept and tracking path analysis as part the OSOM report, as this was the information available at the time.

The proponent has engaged an Original Equipment Manufacturer (OEM) to provide an updated list of OSOM components and sizes. This provides more certainty around availability in the market of fit for purpose vehicles and equipment for this project. Based on OSOM load specifications by the OEM on this information, a design vehicle with a smaller swept and tracking path has been selected.

The current design, including swept and tracking paths, is based on vehicle type smaller than that envisaged in the EIS. It has a 3.4 m wide platform trailer and has a steerable rear axle. The technology used on OSOM vehicles has also improved significantly with split steer rear-axles and 3-to-4-point suspension SPMTs (self-propelled modular transporter) now being a common occurrence to get OSOM loads into sites with constraint access (e.g. Snowy 2.0). This option is currently being further investigated for the Project with positive initial feedback. These vehicles are extremely manoeuvrable, with an option of an electric or mechanical steering, and able to work in terrain with up 8.1 degrees crossfall slopes.

A narrower design vehicle, as mentioned above, will keep further away from the edge of the embankment, which means the load will be carried closer to the centreline of the road where the wheels will be positioned, this will require even less localised widening (subject to further geotechnical investigations). Based on this, the proponent is comfortable that its current option is conservative (3.4 m platform trailer), and it is working towards optimising this even further to a vehicle with a narrower swept and tracking path

This OSOM vehicle was used to re-assess the entire alignment of the KAR based on a number of vehicle swept paths. The initial findings demonstrated that no realignment of the KAR is required, subject to geotechnical investigations. This finding removes the need for horizontal alignment of the KAR for the purposes of the Oven Mountain project. There may still be localised widening required within the existing road corridor to accommodate the required design vehicle swept path. The largest delivery to site, which will govern any road widening criteria, will be the main transformer or turbine which will require an OSOM vehicle. A 3.4 m width platform trailer has been allowed for at the preliminary design stage. With this design vehicle, localised widening (approximately 230 m) within the existing road corridor may be required at one location only (Blackbird Flat).

Initial discussions with each of the Councils indicate that the areas determined require slope and pavement stabilisation for OSOM requirements, overlap with each of the Council identified areas for slope and pavement stabilisation (in alignment with the DRF scope of works). The proponent is working with the councils to provide over mass requirements for integration with their design works and develop a funding agreement to ensure the appropriate funding is agreed to. A Heads of Agreement with Kempsey Shire Council is signed and the HoA with Armidale Regional Council is in the process of negotiation. This will provide for the works to be assessed and approved under a separate approval process with Councils as the proponents, and by financial assistance from the proponent.

6.4 Environmental, social or economic impacts

6.4.1 Aboriginal heritage

- Impacts to sacred sites and land, cultural heritage values, and destruction of Aboriginal cultural heritage sites.

Concerns were raised with regard of project impacts to Aboriginal heritage and values. An Aboriginal Cultural Heritage Assessment (ACHA) was undertaken for the project as part of the EIS (hereafter 'EIS ACHA'). This EIS ACHA was undertaken in accordance with the *National Parks and Wildlife Act 1974* and relevant Heritage NSW guidelines. The EIS ACHA found that the Project area has been subject to both natural and anthropogenic disturbance that will affect the survivability of cultural materials, if present. The preliminary findings of the EIS ACHA contributed to the iterative design and refinement of the Project to avoid and minimise impacts to Aboriginal heritage where possible. This included design refinements to avoid significant Aboriginal sites and places.

After avoidance and minimisation measures had been incorporated into the design, the assessment identified 44 sites and places within or nearby the Project area, of which 19 could be potentially adversely affected. This includes 12 that would be subject to direct impacts resulting in their complete or partial loss. Many of these sites have been assigned a tentative identified status, and further investigation is required to validate them. The East Kunderang Pastoral Station and the highly significant Carrai waterholes, both situated outside the Project area, would be unaffected.

An addendum to the EIS ACHA has been developed to undertake additional field investigations and clarify questions raised by Heritage NSW. This included additional field survey of previously un-investigated portions of the construction envelope, archaeological excavations along the EAR and upper reservoir and specialist arboriculturist investigations of potentially culturally modified trees. These investigations have not substantively altered the findings or models presented in the EIS ACHA.

When incorporating additional desktop information (notably re-consideration of tentatively identified sites), field survey and test excavation results, a revised cultural assemblage within the Project area can be developed. This now identifies the presence of some 24 discrete identified sites, 19 areas of cultural deposits and a discontinuous and distribution of surface and shallowly buried stone artefacts (OMPS-BS1 [#21-5-0178]. Of these, 12 sites and 18 areas of cultural deposits are entirely or partially within the construction envelope. Notable changes include the following:

- The identification of previously undocumented culturally modified trees (OMPS24-ST1 -ST4 inclusive), and a stone arrangement (OMPS24-SA1).
- The identification of four further areas of high density buried stone artefacts, or areas of foci (OMPS-OS1 situated on transect 26, OMPS-OS2 situated on transect 27, OMPS-OS3 situated on transect 29, and OMPS-FA16 situated on test pit UR8).
- The de-classification of several previously documented Aboriginal sites that through further desktop analysis and/or specialist investigations have indicate that they are unlikely to be of anthropogenic and/or cultural origin.
- Some modification to Aboriginal site values due to changes and refinements of the Project area and construction envelope since the EIS ACHA.

While not within the Project area, as per the EIS ACHA, a number of cultural and archaeological sites are within the general environment of the Project, including OMPS-CS4, #21-5-0023, OMPS-AS1, and OMPS-AS36.

Mitigations measures have been identified and will be implemented through the preparation of an Aboriginal Cultural Heritage Management Plan. The ACHMP will also include guiding principles for the management of intangible cultural heritage values identified through engagement with RAPs.

6.4.2 Amenity

- Need for sealed roads (for dust suppression) near private residences.
- Visual, noise/vibration and lighting impacts to East Kunderang Station is underestimated in the EIS.
- Operation 'humming' from transmission lines is of concern.

i Dust suppression

To manage particulate matter emissions during the construction phase of the Project, OMPS has implemented several dust mitigation measures, including watering of dozer areas and unpaved roads within work areas to minimise airborne particles. These measures will be carefully managed to prevent the creation of other hazards, such as slippery road surfaces.

KAR is a council-controlled local road with various sealed and unsealed sections. Generally, the KAR surrounding the Project area is unsealed, except for small sections north of Georges Junction, at Lower Creek, and north-west of Smiths Bluff. To further mitigate dust during construction, OMPS will utilise water carts on unsealed roads at the Project generation site, especially when transporting spoil, and will also water dozer routes regularly.

The emissions from fugitive dust sources, associated with the worst-case construction emission scenario, were quantified in Appendix U of the EIS. The air quality assessment indicated that the predicted cumulative concentrations and dust deposition levels for incremental Total Suspended Particulates (TSP), PM10, PM2.5, and dust deposition during the Project's construction phase are below the applicable impact assessment criteria at all assessment locations.

Furthermore, sections of Kempsey Armidale Road will be upgraded through a collaborative effort between Kempsey Shire Council and Armidale Regional Council, with funding provided by the proponent. The proponent will continue to engage with nearby landholders to address potential impacts and concerns regarding dust, ensuring effective communication and mitigation strategies are in place.

ii Amenity impacts at Kunderang Station

East Kunderang Homestead is located approximately 1.2 km from the Project area and is separated from the proposed lower reservoir by a ridge. This topography, along with existing vegetation, ensures that the homestead will experience no direct or indirect visual impacts from the Project. The visual impact assessment concluded that there will be no visual impact at the homestead, negating the need for mitigation measures.

Regarding lighting, the homestead may experience a low amount of light glow during construction, depending on atmospheric conditions. Nights with low cloud cover, fog, or particulates in the air may cause some light glow, while clear nights will likely see little to no glow at the homestead site.

In terms of noise, construction noise at East Kunderang Homestead has been assessed and will not exceed sleep disturbance guidance levels. Although the homestead provides accommodation, it is considered a commercial assessment location rather than a residence, per the definitions in the *Interim Construction Noise Guideline* (Section 2.1 of Appendix T to the EIS). This guideline sets a target external noise management level of 70 dB(A) (decibel adjusted with an A-weighting filter for relative noise perceived by the human ear) for temporary accommodations like caravan parks and camping grounds. For comparison, the guideline recommends a target of 60 dB(A) for passive recreation areas.

A more conservative approach has been adopted for East Kunderang Homestead, treating it as a hotel-type receiver with internal noise targets as per the appropriate AS2107 category. This results in an internal target noise level of 35 dB(A) and an equivalent external noise level of 45 dB(A).

Table 5.1 of Appendix T to the EIS shows that Phase 2 (main construction works) typically results in the highest cumulative sound power levels, with the exception of the bridge construction over the Macleay River and the initial period of the EAR construction. The assessment adopts these source noise levels on the assumption that they represent the worst-case scenario. The noise results are based on this worst-case assessment and assume a 24/7 construction schedule, which allows for a shorter overall construction duration compared to standard hours. This approach is considered reasonable based on the findings of the noise assessment.

It is considered therefore that the noise, vibration, and lighting impacts were not understated in the EIS. The assessment of these impacts was thorough and based on conservative assumptions to ensure a comprehensive evaluation of potential effects.

iii Transmission line noise

Operational noise associated with electrical infrastructure, also referred to as corona noise, can be noticeable under some conditions due to certain conductor interactions with the air. Technological advances means that this occurrence has and can be reduced. Audible noise impacts are considered separate to EMF impacts, often a community concern associated with the noise. During detailed design, review of final alignments and potential operational impacts will be determined and discussed with landowners as part of easement negotiations.

6.4.3 Aquatic ecology

- The impacts of the proposal on aquatic ecosystems and downstream water users will be significantly greater than the EIS claims, both in the 8 km reach of the Macleay River upstream of Georges Ck junction and during prolonged dry seasons in all downstream reaches of the Macleay.

The aquatic ecology impact assessment (AEIA) completed for the EIS considered downstream aquatic ecosystems. In response to submissions, an updated water balance and a discharge impact assessment has been completed (Appendix E, SWA). The findings have informed an addendum AEIA to provide additional assessment of predicted impacts where required. The results of the assessment for the relevant flow modifications to be caused by the project, identified:

- During water extraction for construction, given the relatively low (and short-term during construction) reduction in baseflow, reduced baseflow is not anticipated to have a significant impact, given the relatively small impact of the take of water for construction it is not expected to have a measurable impact on fish species and or stages of the local species life cycle.

- During water extraction for initial fill of the storage, it is predicted that pumping will occur from approximately December through March to meet the pumping limitations. Many of the reviewed proxy species for the wider catchment biodiversity suggests that there may be some interactions during the initial fill of spawning periods (Australian Smelt), and juvenile movements of other species. There is no way of removing all interactions with species present in the system however the restrictions around pumping periods will mean adequate water levels are present in the Macleay River, where there is adequate space to move around the intake structure and utilise natural available in the wider channel.

- During water extraction for operational top-up, given the small volumes of water predicted to be taken each year for operational top up the impact is considered overall negligible to the wider system and will have less of an impact of taking water compared to any other phases of water taking.

Based on the additional assement undertaken to date (Appendix E, SWA Attachment C) it is not expected that the Project will have measurable change and or impact to the various life stages of common aquatic species, under normal conditions. During more extreme events there is potential to have localised influence on the water quality however the predictions are based on extreme events. Additionally the take of water is unlikely to adversly effect the life cycle of these species with the water take controls in place to minimise the effects of flow and maintain adequate environmental flows.

6.4.4 Biodiversity

- Concern regarding the adjacent environmentally sensitive and protected areas – National Parks, Conservation and Wilderness areas and their values will be compromised as a result of the project.
- Indirect impacts to flora and fauna and native wildlife, loss of habitat and impacts to connectivity.
- Validation of why the impacts to the local population of Brush-tailed Rock-wallaby would not be significant noting that the BDAR states the project will have an adverse impact on critical habitat for Brush-tailed Rock-wallaby.

i Habitat connectivity and adjacent sensitive areas

The Project has been strategically positioned to be primarily situated on private land to avoid impacts to National Parks and conservation areas. The Project site is surrounded by extensive areas of intact native forest (see Figure 4.2 of the BDAR). However, some small areas have discontinuous canopy cover due to minor clearing for agriculture and forestry operations. The generation site is bounded by National Parks Estate to the east, west, and south, and is considered to contain largely intact native vegetation. The access road and transmission line are also largely surrounded by intact native vegetation on private landholdings, with some historical clearing for grazing and forestry operations, particularly on valley floors and lower slopes. The Project area has a very high level of connectivity with surrounding National Parks and forested private properties.

The Project will impact habitat connectivity within the Project area due to vegetation removal and land inundation. Significant areas of infrastructure within the generation site will be rehabilitated following construction, reducing long-term connectivity impacts. For the transmission lines, connectivity will be maintained by retaining native vegetation within spanned valleys and allowing partial clearing within the easement. Although the creation of canopy separation along the transmission line may reduce plant dispersal and animal movements for small, less mobile species, larger, mobile species are unlikely to be impacted. Clearances for the transmission line are limited to areas around the towers and necessary line sag clearance, allowing threatened animals to move around tower clearance locations. Therefore, it is unlikely to significantly impact the ability of threatened species to move through the landscape between areas of habitat.

The Project will involve removing native vegetation and trimming trees along part of an existing track, and clearing intact vegetation for the creation of the EAR. These impacts will be permanent as roads will be maintained during operation. However, the narrow bands of clearing required for the access roads (up to 20 m but typically around 10 m) are unlikely to interfere with animal movement, as these species are capable of traversing narrow tracts of cleared land between forested areas (see Table 8.5 of BDAR for impacts on areas connecting each threatened species habitat, such as movement corridors).

Removal of native vegetation and habitat, and inundation of land, have the potential to fragment fauna habitat, affecting species movement, reproduction, and gene flow (Bennett 1990; Keller & Largiadèr 2003; Dixo et al. 2009). Clearing can impede species movement between suitable habitat patches, particularly affecting sedentary species with low mobility. Species least vulnerable to barrier effects tend to be highly mobile (e.g., birds), although their response to fragmentation can vary. Fragmentation can increase the vulnerability of flora and fauna populations to stochastic events and extinction (Bennett 1990; Smith & Hellmann 2002; Fischer & Lindenmayer 2007).

Currently, animals move between the extensive habitats within the Project area, with the Macleay River being the largest constraint on movement for smaller animals less capable of swimming. During dry spells and lower rainfall years, animals may cross the river. While the reservoirs will impede direct movement across these waterbodies, the Project will not prevent animal movement between these areas, as they will remain connected via large areas of continuous forest and woodland around the reservoirs. Birds, bats, frogs, and some reptiles are likely to continue crossing the reservoirs during operation, although they may be less likely to do so due to reduced cover and higher predation risk. However, the Project is unlikely to prevent the long-term movement of any threatened species from one side of the reservoirs to the other, as habitat will remain connected via large areas of continuous forest and woodland surrounding the inundation areas.

OMPS will design and implement a threatened species monitoring program to ensure that impacts arising from clearing are within predicted levels.

ii Potential impacts to Brush-tailed Rock-wallaby

The actual Brush-tailed Rock-wallaby denning and refuge (critical) habitat to be impacted on is part of the Macleay Gorges. Actual Brush-tailed Rock-wallaby denning and refuge (critical) habitat within the Project area runs along the Carrai plateau, with cliffs and rocky habitat that support refuge areas running to the north-east of the Project area and north -south within the Project area. Where the proposed road between the lower reservoir with the upper reservoir is to be constructed, there is a break in the rocky escarpment approximately 500 m wide. It is considered that the construction of the access road between the two reservoirs is likely to directly and indirectly impact on the one colony within the development footprint.

The Project area was observed to contain approximately 2.89 ha of actual Brush-tailed Rock-wallaby denning and refuge (critical) habitat, with the actual Brush-tailed Rock-wallaby denning and refuge (critical) habitat within the development footprint is: 0.00594 ha. Indirect impacts which have been calculated using a 20 m buffer from the development footprint include an additional 0.02591 ha, giving a total of 0.03185 ha that will be used in this assessment for impacts on actual Brush-tailed Rock-wallaby denning and refuge (critical) habitat for this species.

The Project is considered likely to have impacts on approximately 0.03185 ha of critical habitat for the Brush-tailed Rock Wallaby, impacting one colony containing a minimum of two individuals. The Project will have an adverse impact on critical habitat for Brush-tailed Rock-wallaby; however, it is unlikely to significantly impact the local population of species.

It is considered that such species like the Brush-tailed Rock-wallaby are able to tolerate certain levels of disturbance and impacts from roads that are located in close proximity to refuge habitat. NPWS North Coast Branch undertake regular monitoring of Brush-tailed Rock-wallabies in Oxley Wild Rivers National Park. A known colony is located adjacent to a publicly accessible road along Green Gully Trail.

Existing colonies located immediately adjacent to Green Gully track in Oxley Wild Rivers National Park are known to tolerate road upgrade works and disturbance from public accessing the park in cars and on foot (Piers Thomas, NPWS Senior Conservation Planning Officer, pers. comm.). While males are known to move between colonies within their home range to access females, females are largely sedentary over a smaller home range (DPE 2023b). It is, therefore, considered that any long-term indirect impacts to adjacent colonies from the Project are unlikely to occur, as the colonies are considered to be largely sedentary and unlikely to disperse to other areas of habitat.

The BDAR has been updated and has reassessed impacts to the Brush-tailed Rock-wallaby as per the updates in avoidance associated with the Project design changes.

The Project will cause permanent reduction in the availability of refuge and breeding habitat. Similar habitat in adjacent areas (up to around 100 m away) may become temporarily unsuitable during construction but would be available to the species post construction.

As discussed in Section 3.1, the design of the Project has been through several iterations with biodiversity values being a key consideration in the design of Project elements. The access road proposed to connect the lower reservoir to the upper reservoir was redesigned early in the Project's development when the presence of the Brush-tailed Rock-wallaby was confirmed within the Project area. Initial avoidance included use of LiDAR data to identify areas of habitat, such as cliff lines, rocky escarpments, and features that could support refuge areas for Brush-tailed Rock-wallabies, to avoid impacts to these areas as much as possible. Targeted surveys identified areas of actual Brush-tailed Rock-wallaby denning and refuge (critical) habitat within the Project area. This process identified that the original concept design of the road, which was located further north, would directly impact on substantial areas of areas of actual Brush-tailed Rock-wallaby denning and refuge (critical) habitat. This change avoided about 1.1 ha of actual Brush-tailed Rock-wallaby denning and refuge (critical) habitat. Further measures were undertaken to minimise impacts on actual Brush-tailed Rock-wallaby denning and refuge (critical) habitat during the response to submission stage. The access road between the lower and upper reservoirs was redesigned. This removed impacts actual Brush-tailed Rock-wallaby denning and refuge (critical) habitat where a colony containing a minimum number of 11 individuals was recorded within the project area.

While this habitat could not be completely avoided due to the large area of suitable habitat that separates the two reservoirs, impacts to this habitat was reduced as much as possible to incorporate the road design.

These examples of avoidance, and the overall changes to the design, have resulted in avoidance of a wider array of species and native vegetation.

The Project would impact on habitat constraints by up to 301.9 ha and 0.03185 ha of actual Brush-tailed Rock-wallaby denning and refuge (critical) habitat. This reduction in habitat could result in a small long-term reduction in the size of the local population of the species. The Project is unlikely to degrade remaining 6,470.32 ha of habitat constrains or result in any further decline of the remaining sub-population within the Project area by emplacing the mitigation measures as detailed within the updated Project BDAR on the completion of the construction phase. Based on the assessment in the BDAR, the Project will have an adverse impact on critical habitat for this species for one colony; however, it is unlikely to significantly impact the local population of Brush-tailed Rock-wallabies as only 0.0384 ha of the 2. 85 ha (1.3%) of critical habitat within the Project area will be impacted on as part of the project.

6.4.5 Land

Comments were received in submissions regarding land and contamination. Issues raised included:

- Concern regarding construction disturbing Arsenic and Antimony present in the geology and contaminating the Macleay River. The Geochemistry leachate test had limited total boreholes and exceedances.
- Accuracy concerns of the location and number of reported Arsenic, Antimony and proximal tin mines in the EIS.
- Concern regarding dispersive clay and erodible soils, tunnel erosion, sheet flow velocity and sedimentation and turbidity from rehabilitating areas.
- Concern of faults and fissures leading to instability in the dam walls.
- Concerns with earth works ability to support rehabilitation due to seed collection, propagation and distribution.
- Inadequate river sediment study in the EIS.

i Concerns of Arsenic and Antimony

Key concerns raised in relation to the Project included the presence of arsenic, antimony, and dispersive and erodible soils in some areas that could be disturbed by tunnelling, excavation, blasting and other construction activities. Exposure and mobilisation of metalloids and metals has the potential to infiltrate run-off and contaminate the Macleay River and downstream receivers.

In Appendix O of the EIS, leachable metal and metalloid concentrations from rock samples were compared against several guidelines, including freshwater species protection levels, Australian Drinking Water Guidelines, and pre-construction groundwater data from OMPS. The 95% freshwater guidelines are very conservative and were only used for comparison. Some leachate detection limits exceed these freshwater guidelines, so interpretations are based on the available data. Given that pre-construction groundwater concentrations for some analytes also exceed these guidelines, it is not expected that these leachable concentrations will create an added risk onsite. Importantly, no leachable metals results exceeded NSW TCLP 1 waste classifications guidelines.

Leachate samples exceeded the 95th percentile groundwater concentrations for one antimony sample, but this level is only slightly above the 95th percentile value. All other metals and metalloids, including arsenic, antimony (except one sample), and zinc, were within the range found in groundwater. This suggests that leached metals from rock material are unlikely to impact the receiving groundwater onsite. Pre-construction groundwater concentrations exceed the most conservative ANZG (2018) 95% species protection freshwater guidelines for almost all parameters compared (i.e. aluminium, arsenic, antimony, cadmium, chromium, copper, iron, lead, manganese, nickel and zinc; Attachment B, Table D). This indicates that background groundwater (and surface water) concentrations are naturally elevated compared to guideline values and spoil leachate is unlikely to have an adverse impact.

Therefore, the leachable concentrations are not expected to add any risk onsite. Additionally, no leachable metals exceeded NSW waste classification guidelines.

Since the exhibition of the EIS, further geochemistry assessment has been conducted assessing the potential for leachability of contaminants acid rock drainage (ARD) and neutral rock drainage (NRD) properties, referred to collectively as acid base accounting (ABA) analysis (Appendix G, Geochemistry Assessment).

This assessment found that concentrations of leachable metals from rock samples are considered low and are generally below pre-construction groundwater conditions onsite (Table 6.2 of Appendix [GCM]). The risk of increasing metal concentrations through leaching is considered low. However, while the testing results are considered suitable for waste classification and for assessing geochemical risk of the bulk material expected to be encountered during construction of the Project, a monitoring program is recommended to be included in the water management plan to identify material that may contain concentrated metals.

ii Dispersive soils and tunnel erosion

An erosion hazard risk assessment, including completing soil loss calculations and classes, was conducted. Erosion hazard is high for areas of the Project where slopes exceed 12%, indicating that the soil loss class changes from moderate to high where slopes are between 10% and 20%. Extremely high erosion hazard applies to slopes with gradients greater than 22% to 35%. The erosion risk assessment generally demonstrates a high risk due to the erodibility of soils, slope, terrain and high relief, duration of construction and high rainfall erosivity of the Project area. The highest risk of increased erosion is associated with the initial clearing, stripping and disturbance of construction areas, particularly on the larger infrastructure areas such as the two reservoirs. Extensive areas of soil disturbance with minimal protective soil cover have high potential for erosion and subsequent sedimentation impacts. The ability to manage these areas, through measures such as progressive clearing, use of temporary covers and management of clean water run on (especially where subject to large upstream catchments, such as the lower reservoir) through disturbance areas will be critical to minimising impacts. Lands with soil loss classes ≥4 trigger increased erosion and sediment control management requirements as stipulated in Section 4.4.2 of Landcom (2004) including timing and stabilisation of works as well as slope gradient and slope length limitations. Special measures are required for areas where slopes are between 10–20% at certain times per year and always on areas where slopes exceed 22–35%.

Erosion and sediment controls are a significant consideration for the design (and construction) of infrastructure and even more so in steep terrain. In-depth geotechnical investigations will be completed as part of the detailed design phase to inform practical and constructable mitigation measures to ensure the least probability of batter failure. Other measures that will be taken into consideration will include clean and dirty water cut-off drains to reduce the volume of water over disturbed areas, and sediment basins and discharge structures. Refer to Section 6.3.1iii for further information on geotechnical assessments conducted since the exhibition of the EIS.

Dam and reservoir construction will require the removal of all materials that are unsuitable for engineering requirements and disposed of in well designed disposal sites on site. Top soils, highly weathered material and dispersive soils will be removed from the dam and reservoir foundation footprint. The foundation beneath the dams will be treated with cement grout to minimise the potential for water leakage through the foundation.

A number of geotechnical investigation campaigns have been undertaken at the site to inform the scheme design, and the current campaign is well advanced and due to be completed in Q3 2024.

Mitigation measures for land, soil and erosion impacts include the preparation of a Soil Stripping and Management Plan (SSMP), Soil and Water Management Plan (SWMP), and Erosion and Sediment Control Plan (ESCPs) for the period of construction. An Environmental Management Plan (EMP) will be in place during operations. These documents will detail relevant mitigation measures such as minimising the extent and duration of soil disturbance, sediment basins and rehabilitation works. Examples include:

- Ensure soil is not contaminated with other soil and spoil materials.

- Monitor for dispersion and erosion, particularly of exposed sodic subsoils. Any evidence of erosion may require the addition of ameliorants such as gypsum or lime.
- Monitoring of the placement of excavated rock material.
- Procedures for handling, sampling and testing, classification, storage and disposal/placement of excavated rock to ensure that excavated material is appropriately managed.
- Use trench breakers on sloping sections of any pipeline, waterway crossings and where dispersive soils are present to minimise tunnel erosion along the trench. Where dispersive soils are present, the trench breakers shall be laterally excavated into the in-situ soils either side of the trench to minimise the potential for flanking.

Tunnel erosion can occur post rehabilitation, with water infiltrating into the subsoil and flowing preferentially along available pathways, particularly the disturbed alignment within any backfilled trenches. This results in significant tunnelling and collapse of the backfilled surface especially where sodic and dispersive subsoils are present. This commonly requires re-excavation of the remaining backfill material, importation and treatment of suitable backfill material, backfilling the trench, importation and spreading of suitable topsoil and additional revegetation works.

Since exhibition of the EIS in October 2024, further geochemistry assessments have been conducted and are appended to this Submissions Report (Appendix G).

iii Dam wall safety

The design of the Project has been informed by geotechnical and site investigation programs to provide better understanding and certainty on the underlying geology that will support the Project's construction and operation. These programs commenced in 2021 and have been ongoing, with the most recent program completed in July 2024. Based on the findings to date, the site is stable and suitable and the detailed design for concrete faced rockfill dams and reservoirs can progress as planned.

A preliminary dam break assessment was undertaken as part of the design process, and further dam break and consequence assessment will be undertaken as part of detailed design and for the Dam Safety NSW processes for 'declared' dams. Dam Safety NSW provided a submission on this project (see Section 5.4) and they will continue to be involved as detailed design progresses.

iv Seed collection, propagation and distribution

It is preferred that native seed is collected and used as part of rehabilitation measures across the Project. It is acknowledged that there can be limitations to seed collection, propagation and distribution, and appropriate management and monitoring is required to improve and ensure successful rehabilitation.

A rehabilitation strategy was prepared as part of the EIS for the Project and detailed site rehabilitation plans will be required for progressive rehabilitation. An important part of the implementation of the plans is monitoring for the effectiveness of the rehabilitation measures, and adapting rehabilitation mechanisms as required to ensure the overarching rehabilitation principles can still be achieved. This need for adaptive management was identified in the rehabilitation strategy, and a conceptual trigger, action and response plan provided that will be refined during the development of other management plans required for the Project.

v River sediment studies

Desktop review and field studies were completed to understand the characteristics of watercourses that will interact with the project. This included a detailed surface water assessment (including geomorphology assessment) and aquatic ecology impact assessment (AEIA). The AEIA included sediment quality sampling within Macleay River and its tributaries, including reference sites and impact sites. This is considered adequate and an appropriate level of investigation to inform the baseline condition of the river and inform the risk assessment for impacts to aquatic ecology values. The investigation has allowed for the development of commensurate mitigation measures proportionate to the risk.

6.4.6 Landscape and visual

- Visual, geology and engineering concerns regarding construction of the UDAR, and its long-term impact on the land.
- General concerns for permanent project infrastructure leading to long-term impacts on the local landscape.
- Landscape change from rural to industrial.
- EIS ignores the loss of amenity and high visual impact of the reservoirs to the public travelling on the Macleay River and Bicentennial National Trail.
- East Kunderang and Marys view visual assessments not adequate, and viewpoints do not assess locations from the Macleay River level looking up at the reservoir walls.
- Decommissioning details postponed to detailed design stage, reservoir walls, tunnels and earthworks to remain and potentially never returning site to original state.

i General concerns

The Project is a large-scale infrastructure project located within a natural setting. It is recognised that as a result there will be a change in the landscape and subsequent visual impacts to nearby receivers. The LVIA prepared for the EIS assessed key vantage points of the Project and provided an assessment of the potential change in views and impacts of the Project considering the sensitivity and magnitude of change from the existing setting. There are limited views of the Project in its entirety and key impacts were identified to be associated with the transmission lines which would be visible from many residences.

ii Landscape change

While the Project infrastructure is contrasting within the existing landscape, it is not considered that this results in an 'industrial' change. Potential changes to the landscape have been considered and documented in the Landscape and Visual Impact Assessment (LVIA) (Appendix S to the EIS). Four landscape character zones (LCZs) were identified and assessed for impacts from the Project, which would introduce permanent infrastructure into these moderately and highly sensitive existing landscapes. The LCZs were the Macleay River valley (moderate sensitivity), valleys (moderate sensitivity), upper slopes (high sensitivity), and the plateau (high sensitivity). The magnitude of change in each of these LCZs determined the landscape character impact, which was concluded to be negligible to low for all LCZs except for the Upper slopes upon which the Project would have a moderate impact.

iii Bicentennial National Trail

The Bicentennial National Trail is located along the Macleay valley adjacent to the Project and would have some views of the permanent infrastructure. However, much of this trail is shielded from views by bushland. While any open views would have a high impact, the duration of this view would be limited due to the mobile nature of people traversing the trail. The view from East Kunderang near the Bicentennial Trail was included as a viewpoint in the LVIA and impacts were minimal.

A portion of the Bicentennial National Trail along the river banks of the Macleay River was visited from East Kunderang Homestead (VP1). The trail was surrounded by dense bushland and scrub.

The Bicentennial National Trail (BNT), or National Trail, runs along the western boundary of the southern part of the Project area. The National Trail follows historic coach and stock routes, old pack horse trails, mail runs and country roads for over 5,000 km through Queensland, NSW, Victoria and the Australian Capital Territory. The National Trail was originally conceived as a route for the long-distance horse treks but is now used by cyclists and walkers as well.

A section of the National Trail (part of the 'Georges Junction to Left Hand Hut' section) passes through the western side of the Project site, running adjacent to the Macleay River. This section is one of the more popular parts of the Trail because of its beauty and remoteness. It is estimated that this section of the Trail has on average between 10 and 30 trekkers per month (National Trail, 2022).

The official Bicentennial National Trail (BNT) map of Section 8, Map 4 Georges Junction – Left Hand Hut shows the National Trail runs predominantly along the east of Macleay River from Georges Junction to Peach Tree Crossing (Trail, 2021). The Trail crosses the Macleay River at various intersections including:

- between Broad Crossing and Flaggy Rock Crossing
- at Raffertys Crossing
- at Fingerboard Crossing
- at Peach Tree Crossing/East Kunderang Homestead
- at Carrai Flats.

The National Trail route is situated within the Project site at various sections between Georges Junction and Peach Tree Crossing where it crosses the river to East Kunderang Homestead.

In-depth interviews with National Parks and Wildlife and the Bicentennial National Trail (conducted via telephone and videoconference) during the EIS process.

It is proposed that no access restrictions are applied to recreational areas and facilities during construction as a result of the Project. To maintain access to recreational areas and facilities during construction, the Project should:

- Construct signage near construction works and access roads close to the National Trail, and recreational areas and facilities to inform visitors of the presence of the Project and any changes to access.
- Fence/secure construction works at key points where safety and security are warranted.
- Notify the local community and visitors of upcoming road closures/temporary changes in access arrangements including the Project's stakeholder list and key tourism agencies such as the National Trail organisation, NPWS, Airbnb and DestinationNSW. It is noted that users of the Bicentennial Trail plan their journey via the National Trail website which is the main means of communicating any issues affecting the use of the Trail. This would be a key avenue for communication during construction of the project.
- From operation, establish wooden fencing along the construction footprint where the National Trail route runs parallel to the Project site, to ensure visitors are aware of restricted access and consider information panels to engage and inform visitors.

iv Marys View

VP2 (Marys View) is located within the Kunderang Wilderness Area and was assessed as a key viewpoint. Visible portions of the Project were primarily limited to transmission towers and lines and the overall visual impact rating at this location is Moderate.

v Decommissioning

Decommissioning details of the Project are recommended to be addressed by a management plan as further design is required prior to construction. Part of this design process is to refine and optimise infrastructure siting and mechanical fit out of the generation components. The type of materials used will inform an appropriate decommissioning strategy.

6.4.7 Natural and built heritage

Comments raised in submissions expressed concern with the Projects interaction with natural and built heritage. Key issues raised included:

- Concerns regarding potential impacts and access for visitors to East Kunderang Homestead.
- Concerns regarding potential impacts and recreational value to Georges Junction.
- Proximity to world heritage listed Gondwana Rainforest of Australia and surrounding National Parks.
- Potential impacts to the Bicentennial National Trail where it intersects the Project area, and the lookouts such as Mary's View along the trail.

The Project has been designed to avoid and minimise impacts on built and natural heritage where possible, with all design iterations considering the potential direct and indirect impacts on existing natural and community valued areas. The reservoirs and operations buildings are expected to be visible only from a limited stretch of the Bicentennial National Trail, the Macleay River and Marys View. Good design principles have been implemented to take advantage of natural topography and vegetation screening by siting projects elements strategically within the landscape.

i East Kunderang Station/Homestead

East Kunderang Station, a significant pastoral station located to the west of the Project area, has a rich history of frontier conflict and is associated with the pastoral history intertwined with the work lives of local Aboriginal families. The station is listed on the State Heritage Register for its historical significance, the aesthetic significance of the landscape, and the social and cultural importance for the Aboriginal connection to the site. The homestead at Kunderang East Pastoral Station is an accommodation facility, situated within the Oxley Wild Rivers National Park (OWRNP), is located approximately 1.2 km from the Project area and is separated from the proposed lower reservoir the Macleay River and a ridge. This topography, along with existing vegetation, ensures that the homestead will have no direct or indirect visual impacts from the Project. The visual impact assessment concluded that there will be no visual impact from the Project at the homestead, negating the need for mitigation measures. Depending on atmospheric conditions, this location is likely to experience a low amount of light glow during construction of the Project. During nights with low cloud cover, fog, or particulates in the air, the light glow is expected to be present. During clear nights, little or no glow is expected at the homestead site. Construction noise has been assessed at East Kunderang Homestead to not exceed sleep disturbance guidance levels. Access to the East Kunderang Homestead will not be affected by the Project. Construction activities will not impact public roads including Raspberry Road, East Kunderang Road, or Kempsey Road leading to the homestead.

ii Marys View/Georges Junction

Marys View, also located in the OWRNP, and Georges Junction Campground are predicted to have a moderate visual impact with distant views of some sections of Project infrastructure, albeit not of the pumped hydro energy storage system itself. Georges Junction Campground is a popular campground at the point where Georges Creek meets the Macleay River. There is also a lodge for holiday accommodation located nearby. Project transmission lines will be visible traversing the hillside from Georges Junction. The Project infrastructure will be located along an existing transmission line, which dictates its location in the landscape. Potentially, five sets of towers will be visible along the lower slopes opposite the viewer. North of Georges Junction, the valleys have wooded slopes with cleared grazing pastures along the valley floors. To retain the character of the landscape, existing vegetation will be retained where possible. This will also help maintain existing levels of screening. Construction noise has been assessed at Georges Junction lodgement to not exceed sleep disturbance guidance levels with night works. Depending on the location of the night work, lights may be visible from the Georges Junction campground area. This is only predicted while work on the access road is being performed. The Macleay River valley bends to the west obscuring the surface works around the accommodation and laydown areas. Workers' accommodation will be required during the construction of the Project infrastructure. Due to the curve of the valley, with its forested slopes, the accommodation is not expected to be visible from the campsite, Kempsey Road or any existing residences.

Marys View is a sensitive lookout over the Macleay River as it winds northward toward Georges Junction and is listed as a UNESCO World Heritage area. From this location, the Project is located to the west of the viewer and a small portion of the water in the lower reservoir may be visible along with transmission towers and roads. Due to the distance from the development footprint (4.1 km) and the scale of the infrastructure, the expected change is minimal. However, the high scenic quality results in a moderate visual impact rating.

iii Bicentennial National Trail

A section of the Bicentennial National Trail passes through the western boundary of the southern part of the Project area and remains outside of the construction envelope. The National Trail follows historic coach and stock routes, old pack horse trails, mail runs and country roads for over 5,000 km through Queensland, NSW, Victoria and the ACT. The Project will not impact the use, setting, or landscape of the National Trail both during construction or operations. Hikers and horse riders travelling along the National Trail will have views into some parts of the development during construction. Views into the reservoir and generation plant will only occur along a short portion of the trail. However, over the 6 km distance from Georges Junction to the reservoirs, travellers along the trail will have occasional views of the access road, accommodation camp, laydown areas, and office structures. These views will occur over a longer period as travellers make their way along the trail. As the Project site establishment works and construction activities are considered temporary, landscaping is not proposed to mitigate visual impacts during the construction stage of the Project. Other mitigation measures are proposed as noted in Section 6.4.6).

iv Gondwana Rainforests

The Project area is located partly adjacent to a portion of the curtilage of the World Heritage List and National Heritage List Gondwana Rainforest of Australia (GRA). The forests have high conservation value, providing habitat for rare and threatened species of plants and animals, some with restricted distributional limits. Additionally, it contains evidence of geological history associated with the breakup of the supercontinent of Gondwana. No part of the Project area is in the GRA or a national park and the construction envelope itself is set back from both the Macleay River and the Project area boundary. Activities undertaken in accordance with the Project would be restricted to the construction envelope, and as such no direct impacts to the GRA would occur as a result of the Project. The EIS considered the geology, vegetation, fauna, aquatic ecology, water and hydrology, landscape setting and views, the Indigenous and historic heritage values of the OWRNP as a contributing element to the World Heritage property and National Heritage place values. No direct impacts to the GRA have been identified. Potential indirect impacts have been considered and include:

- edge effect on vegetation through the modification of adjacent vegetation
- disturbance to native animals in adjacent habitat, particularly during construction
- interruption of animal movement
- potential vehicle strike
- blasting and construction noise perceptions for humans in the OWRNP
- bushfire
- alterations to views.

The proposed actions associated with the Project were found to not contravene any of the criteria for significant impacts to shared World and National Heritage values or any of the significant impact criteria for National Heritage values. The magnitude of the impacts was assessed as being 'neutral' or 'slight' for all key attributes of the GRA.

Overall, no significant impact to the World heritage and National heritage listed property has been identified.

6.4.8 Social and economic

- Lack of consultation and difficulty in finding information about the Project.
- First nations engagement.
- Change to the local landscape.
- Concern with emergency services responding to bushfire, accidents and crime.
- Potential for aviation incidents.
- Project cost not including transmissions lines.
- Potential impact the Project will have on access to health and community services.
- Road safety in school zones.
- Employment and training opportunities.
- Extent of benefit relating to long term employment.
- Potential impacts on farmers downstream.
- Property values and fair compensation for host landholders and nearby infrastructure.
- Access to affordable housing and short-term accommodation.
- Maximise local content/local business opportunities.
- Legacy benefits related to housing and accommodation strategy.

- Community benefits sharing.

i Adequacy of community engagement

Multiple submissions were received regarding the perceived lack of consultation and the difficult in finding information about the Project.

The proponent uses a range of engagement mechanisms to consult with neighbouring property owners, the local community, Federal, State and local government, regulators, service providers, local community groups and aboriginal groups. These engagement mechanisms were used and expanded upon in the stakeholder and community engagement activities carried out to support the Project. Consultation carried out during the Scoping and EIS phases of the Project was in accordance with the consultation requirements set out in the *Undertaking Engagement Guide: Guidance for State Significant Projects (DPIE, November 2021).*

A variety of communication and engagement tools were activated for the Project, as part of promoting inclusive, transparent, structured and meaningful engagement for all identified stakeholders. The tools were designed to provide information about the Project and encourage feedback consistent with the SSI Engagement Guidelines and the SEARs.

The Proponent commenced engagement and communication in August 2017 with a series of face-to-face meetings with government stakeholders. Broader consultation activities kicked-off in December 2019, which included liaising with those community members most likely to be interested and/or impacted by the Project. Since early 2020, the Project has sought to engage in an open, ongoing, and accessible manner implementing a diverse range of communication tools to foster project awareness and encourage feedback.

The first Project newsletter was issued in November 2021 and provided a Project overview, including scope of works, road impacts and safety, information about the planning process and EIS field investigations, and an overview of engagement activities. As of March 2024, there have been 12 newsletters published. Newsletters were distributed to a Project mailing list (consisting of almost 1,600 recipients) via email, hard copies made available at local venues (including the Project's Community Information Hub) and published on the Project's website (www.ompshydro.com). The newsletters were also shared on the Project's social media channels.

Project engagement was responsive and recognised that the community liked to engage in different ways and at different times. Drop-in style information sessions offer an informal, inclusive, and flexible approach to communicating key information. Sessions were typically between three and four hours in duration, spaced at different times across multiple days, and held at accessible locations where the community could arrive and leave as they saw fit, access up-to-date Project information (e.g. maps, fact sheets, and newsletters) and talk directly to the Project team. The Project team informed the community about the exhibition of the EIS via the Project website, Project Facebook and LinkedIn pages, an email to the Project mailing list, and direct emails to key stakeholders. The Project team also prepared an EIS Summary of Findings Booklet which was made available in print and copies left at Kempsey and Armidale councils, Kempsey Library, the Community Information Hub, the Macleay Valley Business Chamber September networking event, Willawarrin Hotel, Willawarrin Post Office, Bellbrook Hotel, and letterbox dropped to landowners in Lower Creek. Digital copies (on USB devices) of the booklet were made available to collect at these locations along with links to download the EIS and Summary of Findings on the Project website, Facebook and LinkedIn.

Community information presentations, drop-in sessions, and regional stalls were held in Kempsey (6), Armidale (5), Walcha (1), Bellbrook (2), Frederickton (1), Willawarrin (1), Hillgrove (1), South West Rocks (1), and Ebor Falls (1). Over the years, the team has also supported and attended the Armidale, Walcha, and Kempsey shows; liaised with local councils, community groups – including the Bicentennial National Trail Board – and education and service providers.

OMPS presented at the Save Our Macleay River (SOMR) public forum on Saturday, 19 November 2022. The event, planned by SOMR, included various speakers and was moderated by an independent MC. Due to prior commitments, the Project team could not attend the full session and was allocated 10 minutes to present during the two hour event.

The presentation provided an update on the EIS, clarified the Project's scope, discussed preliminary community benefit sharing plans, noted upcoming industry participation activities, and highlighted First Nations engagement efforts. 100 information packs containing newsletters and factsheets were distributed. Questions from the audience focused on the EIS's timing and rigour, water management, cultural heritage investigations, and the role of Alinta Energy. The team acknowledged that not all questions might have been fully addressed but emphasised their commitment to being responsive and accessible.

To facilitate ongoing communication, a toll-free line (1800 518 194), an email address (info@ompshydro.com), a Project website (www.ompshydro.com), and a Community Information Hub in Kempsey (2/28 Clyde Street) were established. They also hosted 'Power Lunches' at the Community Information Hub, offering small group sessions to learn about the Project, ask questions, and provide feedback. These sessions, bookable online, included a light lunch and an in-depth presentation of the Project.

ii First Nations engagement

Consultation with Aboriginal community for the Project followed the methods prescribed by *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010). This includes pre-notification and notification processes. Ongoing consultation and assessment of the Project has been carried out also in accordance with *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*, including presentation of Project information and assessment methodologies, preparation of impact and mitigation strategies and report review. The formal consultation process was supplemented by additional Aboriginal Focus Group (AFG) meetings.

Since the exhibition of the EIS and the course of time that has transpired, the Project team re-initiated the consultation process, following the methods prescribed by *Aboriginal Cultural Heritage Consultation Requirements for Proponents,* as part of this Response to Submissions Report. In addition to this formal consultation process, separate on-Country and First Nations engagement was carried out to identify key knowledge holders and confirm Traditional Owners.

During preparation of the EIS, individuals and organisations registered their interest in the Project during the notification period. The Project team accepted further registrations throughout the Project regardless of when they have become known or identified their interest. Overall, as part of the EIS the Project had been liaising with 19 RAPs organisations and/or individuals since its inception in early September 2021. Some six of these RAP organisations participated in face-to-face meetings, field investigations (survey and test excavations) and interviews with a highly experienced anthropologist to discuss cultural values.

Feedback during the EIS consultation process included extensive discussion on who speaks for Country, who should participate in the on-site activities and how often, understanding the assessment process, and identifying concerns over broader environmental issues. Not all RAPs were included in on-site activities due to safety restrictions and rostering commitments discussed with the Project team and the RAPs. As a result, the equity and fairness of work was questioned.

Feedback during the recent Submissions Report consultation process also included extensive discussion on who speaks for Country, who should participate in the on-site activities, and who the key knowledge holders are within the community. This consultation included many individuals and organisations not included previously during the EIS on-site activities in order to improve equity and fairness across the Project.

iii Changes to the character of the local landscape

Two submissions were received regarding change to the local landscape. One submission mentioned the area along Bicentennial National Trail and Mary's View. Concerns related to the potential visual changes to the rural character of the landscape from the proposed Project infrastructure located adjacent to Section 8 of the Bicentennial National Trail and visibility of transmission towers and overhead power lines from Mary's View, a lookout of significance that provides enjoyment to the local community and visitors. The visual impact of these areas has been considered in Section 6.4.6 and 6.4.7.

iv Emergency response including bushfire, accidents and crime

Two submissions were received regarding the response to emergency events such as bushfires, accidents and crime in the proposed Project area.

In relation to emergency bushfire response, the EIS (EMM 2023) noted that during bushfire season the Project will develop and maintain a full-time internal firefighting capacity at the main accommodation camp, including a fully trained onsite emergency response team equipped to deal with potential bushfire events.

A submission was received from Fire and Rescue NSW (FRNSW) however did not contain comments or recommendations for consideration. It was noted that should information be provided at a later stage to suggest the development is deemed to pose special problems of firefighting or special hazards exist that require additional fire safety and measures, FRNSW may recommend a Fire Safety Study.

The Project will also liaise with NSW Police and NSW SES to ensure they are aware of potential resource requirements and negotiate provisional arrangements.

In relation to criminal or anti-social behaviour, as noted in the EIS, the Proponent will implement drug and alcohol testing, Project bus services facilitating daily access from site to Kempsey to prevent safety concerns such as drunk or sleep-deprived driving, and ensure all staff have access to phone and internet services at the accommodation camp. The Project will also implement a Worker Code of Conduct which includes:

- no littering
- no alcohol or drugs (other than prescription drugs) to be consumed on site
- no fighting, bullying, harassment or aggressive behaviour by anyone on site.

v Potential aviation incidents

One submitter raised the potential for aviation incidents. The amendment includes the use of helicopters during the construction phase.

The Civil Aviation Safety Authority (CASA) notes that there are no certified aerodromes in the area surrounding the Project site. Potential interaction with other aviation operators includes low flying helicopter operators for pest control, spraying, fire detection and suppression, survey or transmission line maintenance.

It is noted that the transmission line tower, connecting the Project to Line 965, will be approximately 50 m above ground level. Civil Aviation Safety Regulations require that for structures 100 m or higher, CASA needs to be notified. Therefore, CASA does not need to be notified.

The Project will also liaise with NSW SES, Rural Fire Service (RFS) and NPWS with regard to timing of fire detection and suppression or emergency response in the local area.

To further avoid potential aviation incidents, marking of transmission lines or pylons could be implemented.

vi Project cost

One submitter raised project cost including separate budgeting for transmission lines. Concern was raised that the cost of transmission line upgrades would make the project unviable.

The EIS noted that the Project will connect to the existing transmission network via new overhead high voltage transmission lines. The Project includes an approximately 15 km long transmission alignment comprising, at a maximum, double circuit single tower 330 kilovolt (kV) overhead infrastructure and single circuit single tower 132 kV overhead infrastructure, including associated transmission tower sites and easement, substation and switchyard.

The Project intends to transmit and receive power by connecting to an existing Transgrid transmission line that runs between Kempsey and Armidale, known as Line 965. The Project includes the establishment of a transmission connection to Line 965, including the construction of a substation and connection infrastructure, access roads and transmission lines rated up to 330 kV. An upgrade of the existing section of Line 965 from the Project to Armidale will be subject to a separate application under the EP&A Act. The upgrade to Line 965 will be undertaken by Transgrid as noted in Section 6.3.3i. The cost of the upgrade to Line 965 would be borne by Transgrid and, if formally declared as a Renewable Energy Zone project, by EnergyCo.

vii Access to health and community services

Two community submissions were received relating to the impact of the Project on access to health and community services, in particular the impact on Bellbrook and Willawarrin. This issue was also raised by two agency submissions.

It is noted that there are few community services in Bellbrook. Bellbrook offers a general store/hotel, police station, a primary school and a limited range of short-term tourist accommodation. Willawarrin offers a hotel, a general store, a preschool, a primary school and a limited range of tourist accommodation. There are no health services in Bellbrook or Willawarrin.

Community services for vulnerable groups such as Centrelink, youth services and homelessness services in the regional area are predominantly located in Armidale and Kempsey. Childcare services are also predominantly located in Armidale and Kempsey.

Prior to the completion of the accommodation camp, it is possible that some construction workers will reside in Bellbrook or Willawarrin and commute on a daily basis to the Project site. It is unlikely the Project will have an impact on competition at a local level as the workforce is not in the demographic groups that require these services.

The Project is aiming to recruit 30% of labour from the local area that is, Kempsey and Armidale LGAs, for the construction phase. This amounts to 247 workers out of a total of 822 workers. Prior to commencing work, workers will complete their pre-employment medical checks in their hometown, which may include Armidale and Kempsey.

The Project will liaise with local GPs to provide early notice of pre-employment medical checks required for local workers for planning purposes. During the construction phase, a first aid room and first aid kits with appropriate types and quantities of medical supplies will be provided on site. The Project will provide a dedicated appropriately trained person for routine medical requirements and to respond to incidents on site.

viii Road safety relating to OSOM transportation through townships and in school zones

Two community submissions were received relating to road safety, including capacity of local roads to accommodate OSOM vehicles on main roads through townships and road safety in school zones.

The Transport Impact Assessment (TIA) report for the EIS recommended various mitigation measures addressing all key traffic impacts including impacts related to hazards and heavy vehicle movements in school zones. In addition to the mitigations recommended in the TIA, it is proposed that heavy truck movements are restricted in school zones during school zone times. Further, it is proposed that the Project provide SMS notifications to the community on the timing and frequency of road closures, OSOM vehicle movements and other key traffic movements in the local and regional area.

ix Employment and training opportunities

Three submissions were received in support of the Project, relating to employment and training opportunities including employment of young people and regional development.

The Economic Assessment (EA) for the EIS considered the net economic benefits of the proposed Project on the regional economy and NSW economy. The EA estimated up to $44 million in annual direct and indirect household income will be generated through construction employment in the regional economy. The EA calculated the construction phase of the Project will generate up to 1,653 direct and indirect jobs and up to $147 million in annual direct and indirect household income to the NSW economy.

In relation to employment and training, the Project will implement a regional employment target of 60% of total Project employment for the construction phase. This consists of 30% of workers whose primary residence is within the Armidale and Kempsey LGAs and 30% who reside outside of these LGAs but within 100 km of the Project site. The Project also has an opportunity to identify and implement a regional target for the number of traineeships and apprenticeships the Project will provide. It is also proposed that the Project consider partnership opportunities with schools in the local area and key urban areas as well as regional TAFE and universities. A community enhancement scheme could be established as part of the Projects Benefits Sharing for community programs and grants which could include local education and training initiatives. If implemented, the Project will track progress against these targets and report to the community through ongoing community engagement initiatives.

x Extent of benefit relating to long term employment

The Project will provide approximately 822 construction jobs and around 30–50 jobs during the operation of the Project. The construction phase will run over five years. The Project's operation phase will extend over 100 years.

The Economic Assessment prepared for the EIS indicated that the operation phase of the Project will generate up to 95 direct and indirect jobs in the regional economy and up to $8 million in annual direct and indirect household income. The EA estimates up to 198 direct and indirect jobs will be generated for the NSW economy from the operation workforce producing up to $20 million in annual direct and indirect household income for the NSW economy.

The Project will employ regional residents preferentially where they have the required skills and experience and locally sourcing non-labour inputs to production where local producers can be cost and quality competitive. Potential partnerships between the Project and local TAFE and schools will also provide long term training and skill development opportunities.

xi Water usage by the Project impacting farmers downstream

One submission was received relating to water usage by the Project and the potential impact on farmers downstream.

Access conditions are proposed to limit water take and protect existing downstream users and environmental receptors during dry periods, and these conditions are detailed further in the updated Surface Water Assessment provided in Appendix E.

To minimise potential impacts to downstream users and environmental receptors, extraction for initial fill purposes will only occur during periods of high flow. High-flow-only access rules to be applied to the initial storage fill means there will be a minimum of 597 ML/day available for downstream users when extraction is occurring at higher pump rates. Extraction at lower pump rates (e.g. 2.8 ML/day) is expected to result in less than 1% reduction in available streamflow under most conditions.

Extracting water for construction and initial storage fill is not expected to impact the security of water supply to downstream users as:

- The maximum extraction volume in a given year (7,250 ML) represents on average 1% of the annual streamflow volume adjacent to the Project area and hence water available to downstream users.
- Extracting water for construction at a rate of 2.8 ML/day is expected to be in line with extraction rates experienced across the broader Macleay River catchment and is predicted to have less than a 3% impact on the streamflow regime for 90% of Macleay River flow conditions adjacent to the Project area.
- It is proposed to maintain the 50th percentile streamflow when extracting water at higher rates (up to 86.4 ML/day), thus no impacts to downstream water security are expected during periods of low flow.
- High-flow-only access means there will still be a minimum of 597 ML/day available for downstream users when water for initial storage fill is being extracted.
- The proportion of streamflow extracted, and associated impacts decrease with distance downstream of the extraction site as the contributing catchment increases.
- Most of the water take will occur during the initial storage fill period which is a one-off take and will occur for a relatively short period of time (i.e. 3–12 months). Hence, any residual impacts would be short-term.

xii Property values and fair compensation for host landholders and nearby infrastructure

One community submission raised issues with the associated upgrade of Line 965. The submitter was concerned with property values of and fair compensation for host landholders, associated with that upgrade. Other issues raised related to impact of the upgrade on human and animal health, environmental issues, fencing restrictions, humming noise, property aesthetics and value and design preferences of the towers.

At present, Line 965 is a single-circuit 132 kilovolt (kV) electrical transmission line that spans between the population centres of Armidale in New South Wales's (NSW) New England Region and Kempsey in the North Coast Region. The current Project includes a transmission line that connects to Transgrid's Line 965. However, the upgrade of Line 965 from its current 132 kV to 330 kV is not included in this Project application.

xiii Access to affordable housing and short-term accommodation

A response to this concern has been provided in Section 4.1.4.

xiv Maximise local content/local business opportunities

Procurement opportunities from the construction phase of the Project may benefit local businesses. The Project will procure various goods and non-goods to construct the Project with the total estimated cost of the Project being around $1.97 billion. Smaller, long term work packages are likely to be available during the 100 year operation phase.

Of the 5,054 registered businesses in the regional area, 30.1% operate in the construction industry. The EA calculated the average annual economic benefits of the construction phase on the regional economy is up to $248 million in total business revenue over six years. For the NSW economy, total business revenue from the construction phase of the Project is estimated to be up to $535 million.

The flow on effects of the construction phase will likely include demand for accommodation and food services, transport, postal and warehousing, financial and insurance services, rental, hiring and real estate services, retail and wholesale trade, education and training, health care and social assistance and administrative and support services.

Total direct and indirect regional value added to the regional economy during the operation phase is estimated to be up to $112 million and up to $128 million annually for the NSW economy. During operation, there will be an ongoing need for management and regular maintenance and repairs to the operational infrastructure. This will include maintenance of plant and equipment and systems within the power station complex, intake structures, gates and control building; maintenance of access roads and tracks; dewatering of the headrace and tailrace tunnel; maintenance of electricity and communications infrastructure; and maintenance of transmission lines and sub-substation as required. The operation of the Project will require ongoing servicing including power, communications, sewage and water.

Given the specialised nature of the operational infrastructure, it is expected that regional businesses capacity to perform required services may be limited. It is, therefore, assumed that some maintenance work will be contracted to businesses outside of the regional area. However, some regional businesses may have sufficient lead time to develop this capacity.

Given the limited capacity of regional businesses, the Project will develop and implement a regional procurement strategy to target procurement at the regional level. The Project will undertake direct engagement with regional businesses to provide regular project updates including on timelines and upcoming procurement opportunities.

xv Legacy benefits related to housing and accommodation strategy

The Project will establish three temporary camps and one main accommodation camp on the Project site to house construction workers during the 5-year construction phase. The objective of establishing the camps is to avoid impacting the local rental accommodation and housing market by increasing demand for limited local housing thereby increasing house prices and rental prices. The Project will not construct houses outside of the Project area for its workers as this is outside its remit.

As part of the decommissioning phase, an assessment will be conducted to determine whether there are resources from the accommodation camps that could be provided to Council for use in social housing or other community housing.

xvi Community benefits sharing

The Project presents an opportunity to contribute to economic goals and aspirations developed by the Armidale Regional and Kempsey Shire Councils, and the broader New England Renewable Energy Zone (REZ). The Project has not confirmed the design of the community benefits program. The design will form part of discussions with the Armidale Regional and Kempsey Shire Councils in the negotiations for the Voluntary Planning Agreements. The VPA with Armidale Regional Council (ARC) will align with the *Draft Benefit Sharing Guideline. Guidance for state significant renewable energy development* (DPIE, November 2023) and ARC's *Renewable Energy Community Benefit Framework* including commitments to off-site social benefits for the local and regional community including inter-generationally. Further detail is provided in Section 4.1.6.

A number of new access roads will be constructed as part of the Project including a new Eastern Access Road on the southern side of the Macleay River. High grade communications will also be required as part of the ongoing operations of the Project, including new fibre optic infrastructure. This infrastructure will be delivered as part of the proposed electricity transmission work and should facilitate improvements to local mobile telecommunications in the local area.

Under the *Electricity Infrastructure Investment Act 2020*, the First Nations Guidelines (2022) establish commitments for critical State significant infrastructure (CSSI) and State significant development (SSD) projects in NSW. The First Nations Guidelines confirm economic participation targets for Aboriginal-owned businesses, direct employment of Aboriginal or Torres Strait Islander peoples, and education, training or capacity building for Aboriginal staff of Project contractors.

The Project must meet one or a combination of the following targets:

- at least 1.5% of the contract value to be subcontracted to Aboriginal-owned businesses
- at least 1.5% of the contract's Australian-based workforce full-time equivalent (FTE) that directly contributes to the contract to be Aboriginal or Torres Strait Islander peoples
- at least 1.5% of the contract value to be applied to the cost of education, training or capacity building for Aboriginal staff or businesses directly contributing to the contract (OECC, 2022a).

6.4.9 Water

- Pump infrastructure and pumping and flow regime.
- Reduction of flows to downstream users and availability of water during drought or restrictions.
- Impacts during construction including diversion of water, impacts to water quality.
- Insufficient bore sampling.

i Pump infrastructure and extraction regime

The Project includes pump infrastructure for general construction water as well as infrastructure for the initial storage fill. Key components of the proposed pump infrastructure is provided in Appendix E (SWA, Section 5.5.4) and will be further developed during detailed design, including ensuring the design and construction is prepared with consideration of DPI Fisheries recommended guidelines:

- *The practical guide to modern fish-protection screening in Australia* (Boys, Rayner, Kelly, Doyle, & Baumgartner, 2021)
- *Design specifications for fish protection screens in Australia* (Boys, Design specifications for fish-protection screens in Australia. Edition 1. NSW Department of Primary Industries., 2021).

Construction activities will require a steady source of water at relatively low rates and greater extraction rates are required for the initial storage fill. The proposed extraction conditions for water take from the Macleay River for construction, initial storage fill, and operational top-up purposes are summarised in Table 6.1 and further detail is provided in the updated SWA (Appendix E).

Table 6.2 Proposed extraction conditions – Macleay River

Water take	Volume required	Estimated extraction period	Cease to pump trigger[1]	Pumping rate[7]	Additional conditions
Construction water	Up to 1,000 ML/year	4–5 years[5]	13 ML/day[2]	2.8 ML/day	• Water must only be taken when there is a visible flow in the water source at the location where water is to be taken.
Initial storage fill	6,250 ML	3–12 months	597 ML/day	Up to 86.4 ML/day (1 m^3/s)	• The 50th percentile streamflow value is to be maintained. • Pumping to cease if 30 day streamflow total[1] below 5 year ARI value of 1,936 ML. • No extraction for first seven days following a flow event greater than 50th percentile streamflow[1] value following extended dry period or drought[3]. • Water must only be taken when there is a visible flow in the water source at the location where water is to be taken. • Consideration of special circumstances[4].
Operational top-up	Up to 130 ML/year[6]	Ongoing	597 ML/day	Up to 86.4 ML/day (1 m^3/s)	• The 50th percentile streamflow value is to be maintained. • Pumping to cease if 30 day streamflow total[1] below 5-year ARI value of 1,936 ML. • No extraction for first seven days following a flow event greater than 50th percentile streamflow[1] value following extended dry period or drought[3]. • Water must only be taken when there is a visible flow in the water source at the location where water is to be taken. • Consideration of special circumstances[4].
			13 ML/day[2]	10% of streamflow	• In accordance with the rules of the Macleay WSP. • Maximum pumping rate of 10% of the observed streamflow in the Macleay River. • Water must only be taken when there is a visible flow in the water source at the location where water is to be taken.

Notes:
1. Streamflow measured at Macleay River at D/S Georges River Junction (206024) stream gauge.
2. 'Very low flow' conditions for the Macleay Gorges Water Source as defined in the Macleay WSP.
3. Extended dry period or drought refers to the 30-day streamflow total below 5-year ARI (1,936 ML) as defined in SWA Section 4.4.2iv
4. Special circumstances to be assessed on a case-by-case basis with the corresponding protocols to be documented in the SWMP.
5. Construction water will be required until construction of the Project is complete. Construction water may be required for more than the estimated 4–5 years if the construction program experiences delays.
6. The operational top-up volume is based on the water balance modelling described in SWA Section 7.2. Actual operational top-up volumes may exceed this value on occasion. OMPS will hold all water entitlements prior to take occurring as described in the SWA.
7. All values are based on a constant rate over a 24 hour period.

ii Potential impacts to downstream users

Construction water requirements are estimated to be up to 1,000 ML/year over the approximate five year construction program while an initial one-off storage fill volume of 6,250 ML is also required. The initial one-off filling of the reservoir will be pumped from the Macleay River during high flow periods. This initial fill would be extracted in accordance with a Specific Purpose Access License (SPAL) which would condition this activity in a manner which does not compete against downstream users. The maximum annual water take for construction and the one-off initial storage fill (7,250 megalitres per year (ML/year) represents 1% of the average annual streamflow volume in the Macleay River adjacent to the Project area.

During operation, it is anticipated that up to 130 ML per year will be required for "top-ups" although this would be infrequent. If needed, this would be extracted at a rate of up to 86.4 ML per day. By comparison to the initial fill, the maximum operational top-up volume of 130 ML is 0.01% of the average annual streamflow volume adjacent to the Project area.

It is proposed to achieve the initial storage fill within a 12 month period. The average time to complete this one-off event is expected to be approximately six months. However, a longer initial fill period (up to two years) may be required if dry or drought conditions are experienced during the construction period. The length of time is because the extraction needs to be managed in a way that does not impact downstream users and the environment, but also because the initial take is dependent on hydrological conditions.

Access conditions are proposed to limit water take and protect existing downstream users and environmental receptors during dry periods. To minimise potential impacts to downstream users and environmental receptors, extraction for initial fill purposes will only occur during periods of high flow. High-flow-only access rules to be applied to the initial storage fill means there will be a minimum of 597 ML/day available for downstream users when extraction is occurring at higher pump rates. Extraction at lower pump rates (e.g. 2.8 ML/day) is expected to result in less than 1% reduction in available streamflow under most conditions.

Extracting water for construction and initial storage fill is not expected to impact the security of water supply to downstream users as:

- The maximum extraction volume in a given year (7,250 ML) represents on average 1% of the annual streamflow volume adjacent to the Project area and hence water available to downstream users.
- Extracting water for construction at a rate of 2.8 ML/day is expected to be in line with extraction rates experienced across the broader Macleay River catchment and is predicted to have less than a 3% impact on the streamflow regime for 90% of Macleay River flow conditions adjacent to the Project area.
- It is proposed to maintain the 50th percentile streamflow when extracting water at higher rates (up to 86.4 ML/day), thus no impacts to downstream water security are expected during periods of low flow.
- High-flow-only access means there will still be a minimum of 597 ML/day available for downstream users when water for initial storage fill is being extracted.
- The proportion of streamflow extracted, and associated impacts decrease with distance downstream of the extraction site as the contributing catchment increases.
- Most of the water take will occur during the initial storage fill period which is a one-off take and will occur for a relatively short period of time (i.e. 3–12 months). Hence, any residual impacts would be short-term.

iii Construction impacts

Water management during construction and operation of the Project will be a key factor in mitigating Project related impacts to the receiving surface water environment. A Project-specific water management approach has been developed with the aim to implement all practical measures to avoid or minimise Project related impacts. The key aspects of the proposed water management approach are summarised in Table 6.3 below and provided in detail in Appendix E (SWA, Chapter 5).

Table 6.3 Water management summary

Key aspect	Management approach
Erosion and sediment control	Erosion and sediment control risks during construction will be managed via the implementation of Erosion and Sediment Control Plans (ESCPs) to be prepared within an overarching Project Soil and Water Management Plan (SWMP). The Project SWMP and ESCPs will be developed in accordance with best practice erosion and sediment control guidelines. The Project SWMP and associated ESCPs will be developed prior to the commencement of construction. Further detail on erosion risk and proposed management measures is provided in the Appendix P of the EIS (EMM 2022b).
Stormwater management	The stormwater management approach will vary based on the type of disturbance, construction activities and environmental factors such as topography. The stormwater management approach for each construction area will be documented within the SWMP and relevant ESCPs. The following measures are proposed: • management of clean water runoff from upslope areas and watercourses that traverse disturbance areas • sediment basins to capture and treat runoff from larger construction and disturbance areas • stormwater harvesting from sediment basins to reduce discharge volumes and frequency • source controls such as sediment traps or filters will be installed at discharge locations to reduce coarse sediment in runoff where sediment basins are not practical • source controls to isolate potentially polluting construction activities (i.e. concrete batching) from the stormwater system • measures to manage unforeseen events such as leaks and spills.
Process water management	The process water system aims to supply water (via the water supply system) to, and manage water produced by, construction activities. The following measures are proposed: • process water will be isolated from the stormwater system where practical to reduce the volume of water that requires management • process water will be collected, treated, and reused to reduce demand on the water supply system and discharge volumes • excess process water will be treated prior to discharge to the receiving environment.
Water supply system	A water supply system is proposed to supply water for potable water use, general construction water demand, initial fill of Project reservoirs and periodic operational top-up as necessary. The water supply system will extract water from the Macleay River via pump and pipeline. The following mitigation measures are proposed when extracting water at higher rates for initial storage fill and operational top-up: • extraction will only occur during high-flow (greater than 50th percentile) conditions • extraction will not occur during extended dry periods or drought • no extraction will occur during the first seven days of the first high-flow event following extended dry periods or drought to allow the river to recharge. Water extracted at lower pump rates (up to 2.8 megalitre per day (ML/day)) for general construction purposes will be subject to the conditions and rules outlined in the relevant water sharing plan (WSP).
Wastewater management	• All wastewater (i.e. sewage) will be captured and treated in accordance with the relevant industry guidelines and standards. Wastewater will be preferentially reused onsite to meet construction water demands.

Key aspect	Management approach
Instream works	• Instream works and disturbance of waterfront land will be completed in general accordance with the NSW Department of Planning and Environment's (DPE) guidelines for controlled activities on waterfront land. • All instream structures and services will be designed by a suitably qualified professional in accordance with industry standards and guidelines. • All works to be documented within the SWMP and ESCPs and be completed in accordance with the management approach for erosion and sediment control and stormwater management.
Flood risk management	• Flood risk management procedures during construction and operation will be documented within a Project specific Flood Management Plan (FMP) to be developed prior to the commencement of construction.

iv Bore sampling

Groundwater and surface water monitoring commenced in August 2020 (and is currently ongoing). The groundwater impact assessment (GIA) has been updated and has incorporated additional data gathered since exhibition of the EIS. The GIA is provided in Appendix F.

Data collection increased throughout the baseline monitoring period as additional locations were identified or constructed. The baseline network included:

- seven cased boreholes, drilled in 1996 during a geotechnical site investigation program (SMEC, 1997)
- A dedicated groundwater monitoring network, designed by EMM and in consultation with the then DPE Water (now DCCEEW), comprising:
  - eight conventional monitoring bores targeting the regional groundwater systems, as documented in the hydrogeological investigation program report (provided with the GIA)
  - three fen monitoring bores, targeting high potential groundwater dependant ecosystems
  - one third-party production bore
- 11 spring locations and one 1 seep location, opportunistically sampled during routine monitoring events when visibly flowing
- four boreholes containing nine vibrating wire piezometer (VWPs) sensors in total targeting key infrastructure components
- eight surface water monitoring sites, comprising:
  - six locations within the Macleay River
  - one location within a second order ephemeral stream
  - one location within an upper tributary of the Macleay River catchment (east of Armidale, NSW).

The network established is considered sufficient to provide adequate baseline conditions on the groundwater environment and provide a robust conceptual groundwater model of which an updated assessment has been completed and provided with this Submissions Report (Appendix F, GIA).

6.4.10 Traffic

- Justification for the UDAR, and why the Carrai access to the upper reservoir is not sufficient.
- Concerns regarding project related traffic passing three schools adjacent to construction movements.
- Need for crossing and Georges Junction to reduce traffic on the Kempsey to Armidale Road for the safety of local residents.
- Further information on traffic movements and upgrades to Carrai Road. Concerns over potential heavy maintenance putting nearby karst caves at risk.
- Increased traffic potentially impacting wildlife.
- Increased traffic through the town of Kempsey and the villages of Willawarrin and Bellbrook, particularly during the construction phase.

i Justification of access roads

Constructing the Upper Dam Access Road (UDAR) avoids the significant environmental and regulatory challenges associated with upgrading the Carrai Road, which runs through the Carrai National Park. To allow for a large increase in traffic during construction, including OSOM vehicles, Carrai Road would require extensive upgrades along the 32 km section that is located within or adjacent to the National Park. The upgrades would result in unacceptable environmental impacts and be compounded by regulatory framework governing national parks under the *National Parks and Wildlife Act 1974* (NPW Act). Using Carrai Road as the primary construction route for the upper dam and reservoir construction traffic will increase vehicle strike on wildlife in the Carrai National Park. Construction of the UDAR avoids the increase in construction traffic through the national park, minimising the risk on the park's biodiversity. Onsite vehicle movements during construction and operation using the Carrai access would be inefficient. Not constructing the UDAR leads to a four-hour one-way trip between the upper and lower reservoirs extending the construction timeline increasing emissions. The UDAR also provides critical safety and operational advantages, particularly in terms of bushfire management and emergency services access. It creates multiple exits from the upper reservoir in case of bushfire offers a better range of access for emergency services, including the Rural Fire Service (RFS), police, and ambulance services to the Project area.

ii Traffic and schools

The safety impacts of Project traffic will be managed throughout the life of the project. Management measures for public safety, such as a drivers' code of conduct will be developed and included in a traffic management plan. OMPS would work with relevant road authorities (ARC, KSC and TfNSW) to agree and implement these strategies during construction.

There are several school bus route signs along the approach and departure sections of Kempsey Armidale Road in the vicinity of Bellbrook Public School. There are two schools are located relatively further away from the site, closer to Kempsey. The service times show that school buses are unlikely to coincide with the construction related vehicles, especially in the PM peak.

There are up to 17 school buses each weekday morning and afternoon travelling along KAR and 18 school buses along North Street and Second Lane. There is a school zone and bus zone on KAR (also known as Main Street at Bellbrook) at the frontage of Bellbrook Public School. It is assumed that majority of the incoming light vehicle traffic would arrive between 5:00 am and 9:00 am and depart between 3:00 pm and 6:00 pm. Inbound heavy vehicle traffic would be approximately evenly distributed between 5:00 am to 6:00 pm and outbound heavy vehicle traffic between 9:00 am to 7:00 pm. There would be no construction heavy vehicle movements in the three school zones on Kempsey Armidale Road during school drop-off/pick up hours (i.e. 7:30 am to 9:30 am and 2:30 pm to 4:30 pm) or between 7:00 pm to 5:00 am. However, an OSOM vehicle is not defined as a heavy vehicle and is subject to separate conditions. Any OSOM movements will occur outside peak times, as described in Section 7.7.

Construction heavy vehicles will not be operating within school zones on Kempsey Armidale Road between Kempsey and Bellbrook during school bus operating hours i.e. between 7:30 am to 9:30 am and 2:30 pm to 4:30 pm. Additionally, construction heavy vehicles will not be operating on the KAR between Bellbrook and the EAR (main access road entry point) during school bus operating hours (i.e. between 7:30 am to 9:30 am and 2:30 pm to 4:30 pm). Due to the proposed cease in operation of construction heavy vehicles during the school pick-up and drop-off time (NSW school terms only), traffic impacts on school buses and school zones would be negligible.

iii Western access temporary crossing

Since the submission of the EIS, a secondary access route to the site during construction has been proposed with the Western Access Temporary Bridge as an extension to the existing road on the north side of the Macleay River. This temporary bridge will connect the western side of the Project area through the existing road to the Kempsey-Armidale Road. This access also connects to the Main Access Road which then provides access to the main construction and generation areas of the Project. Secondary access via the Western Access Temporary Bridge will reduce construction traffic departing from Armidale along the section of the Kempsey Armidale Road where it meets the Macleay River between Georges Junction and Smiths Bluff. All heavy and light vehicles mobilising from Armidale will utilise the secondary access of the Western Access Temporary Bridge until the Eastern Access Road is constructed. The Western Access Temporary Bridge will be decommissioned before the Project becomes operational.

iv Access via Carrai Road

An initial mobilisation via Carrai Road to the Upper Dam Emergency Egress Road is also proposed, subject to agreement with NPWS. The road would be maintained to ensure all weather access only, with no widening and minor pavement upgrades to the existing road being proposed. The initial mobilisation will be limited to equipment required to commence the construction of the UDAR.

v Potential wildlife impacts

There will be increased vehicle traffic on publicly accessible roads adjacent to the Project area during the construction phase. Further, access tracks will be established in the disturbance footprint leading to an increased potential impact of vehicle strike. Unmitigated, this has the potential to result in increased mortality of animals due to vehicle strike in these areas. Rare or low-density populations are most at risk of significant impacts if this impact is not managed appropriately (Hoskin, CJ & Goosem, MW 2010). Despite some level of impact being possible, the majority of impacts will be limited to common or abundant species. The potential for increased traffic during construction to result in increased mortality of native animals would be minimised by the construction traffic driving rules in high risk sections of road at night when most native animal species are active. Mitigation measures include:

- implementation of construction traffic driving rules in high-risk sections of road speed limits and limitation of construction traffic movements at night
- construction traffic rules at night
- finding alternatives to fencing to prevent and minimise fauna vehicle strike
- placement of speed restrictions on key roads to minimise potential for fauna vehicle strike.

For impacts of threatened species or fauna that are a part of a threatened ecological community from vehicle strikes see Table 8.7 of the revised BDAR.

vi Increased traffic on local townships during construction

Construction traffic for the Project will consist of construction workers' light vehicles and heavy vehicles transporting equipment, building and construction materials, waste, and spoil removal to/from the Project area. Construction traffic, apart from OSOM vehicles, is expected to arrive from or via Kempsey and travel through Willawarrin and Bellbrook as the main access route.

An Addendum TIA was prepared for the Amendment Report and assessed that at the peak of Project construction, there would be 213 daily vehicle movements from 155 light and 58 heavy vehicles each day. Of this traffic, there would be no daily vehicle movements passing through the Kempsey town centre (via the Belgrave Street/River Street route). Instead, all traffic will be traveling through Frederickton (via the Macleay Valley Way/Second Lane route), where there would be 183 daily vehicle movements from 137 light and 46 heavy vehicles each day. For the Armidale route, there would be 30 daily vehicle movements from 18 light vehicles and 12 heavy vehicles.

All Project vehicles will bypass Kempsey town centre. Project vehicles will travel via the Pacific Highway, Macleay Valley Way, Second Lane and North Street to avoid traffic congestion at the Macleay River bridge in Kempsey town centre at the intersection of Smith Street and Lord Street.

The TIA recommends various mitigation measures addressing all key traffic impacts including impacts related to hazards and heavy vehicle movements in school zones. In addition to the mitigations recommended in the TIA, it is proposed the Project restricts construction heavy vehicles within school zones on Kempsey–Armidale Road between Kempsey and Bellbrook during school bus operating hours i.e. between 7:30 am to 9:30 am and 2:30 pm to 4:30 pm. Additionally, construction heavy vehicles will not operate on Kempsey-Armidale Road between Bellbrook and the Eastern Access Road (EAR) (main access road entry point) during school bus operating hours, that is, between 7:30 am to 9:30 am and 2:30 pm to 4:30 pm. Due to the proposed cease in operation of construction heavy vehicles during the school pick-up and drop-off time, traffic impacts on school buses and school zones relating to traffic congestion and road delays would be significantly reduced.

It is also proposed that Project OSOM vehicles operate only at night time to minimise traffic congestion. It is also recommended that SMS notifications to the local community on the timing and frequency of road closures, OSOM vehicle movements and other key traffic movements in the local and regional area.

A dedicated Community Complaints phone number will be established that is available 24 hours, seven days a week for community members who have enquiries or who wish to lodge complaints in relation to Project construction activities, including enquiries or complaints about Project related vehicles travelling on the public road system.

6.4.11 Cumulative and other impacts

- Concern regarding "large" amounts of diesel, concrete and explosives used in order to construct a green energy operation.
- Concern regarding the greenhouse gas emissions produced with the net loss of electricity produced.
- Potential additional greenhouse gases attributable to the project by the time of commissioning.
- Use of wind, solar and additional infrastructure to reduce energy deficit.
- concern relating to the lack of proper consideration of climate change with no hydrology or water balance modelling for future climate states.
- Climate change on the day-to-day water balance of the proposed pumped hydro scheme that uses uncovered reservoirs for its water storage not adequately addressed. Concern regarding NSW climate change planning scenarios being behind actual data.
- Climate change preventing top-up from the Macleay River for extended periods during drought.
- Health concerns from 330 kV lines in proximity to wildlife and children.
- Concern regarding waste and rubbish generated on and off site.
- Concern regarding cumulative impacts on the land due to the increase in renewable projects.

- Concern regarding cumulative impacts from agriculture and renewable projects on the volume of water in the Macleay River.

i Greenhouse gas emissions and integrated renewables

Various amounts of diesel, concrete and explosives will be used in the construction of the Project. These materials and methods are indeed associated with carbon emissions and other environmental impacts. However, it is important to consider the full lifecycle of the Project to understand its overall benefits.

The largest amount of diesel will be used during the construction phase to fuel plant equipment, trucks and electricity generators. Operational diesel use will be much lower and will principally be fuel combustion from vehicles travelling between the Project's infrastructure. Mitigation measures for lowering emissions diesel combustion emissions include:

- minimising equipment idling wherever feasible
- shortening haul distances in Project design as far as practicable (such as batching concrete on-site)
- use low-sulphur diesel fuels and lubricants where feasible.

Concrete will be used in the construction of the pumped hydro generation works including the upper and lower reservoir and spillway. The durability and longevity of concrete structures mean they will provide service for many decades, paying off their initial environmental impact over a long period. Excavated material will be used to provide rockfill for the dams, road base and concrete aggregate, if deemed suitable, while also increasing the capacity of the reservoirs.

Controlled use of explosives is necessary for excavation and shaping of the roads, reservoirs and tunnels which are employed following strict safety and environmental regulations to minimise impact.

Once operational, the Project will significantly contribute to reducing reliance on fossil fuel power plants by providing renewable energy storage and grid stability. This storage capacity supports the integration of intermittent renewable energy sources like wind and solar, facilitating a transition to a cleaner energy grid. The initial carbon footprint from construction is offset over time by the reduction in carbon emissions from fossil fuel power plants that the Project system enables. The Project has long operational lifespans (roughly 100 years), during which it will provide clean energy storage and underpins cheaper electricity prices in the NEM and enhances the overall efficiency and stability of the market.

While there is a net loss of electricity during the energy storage and retrieval process due to inefficiencies (typically around 20–30%), this loss is outweighed by the benefits of storing renewable energy and providing grid stability. The Project will allow the utilisation of excess renewable energy generated during periods of low demand, which would otherwise be wasted. See Section 6.5.1ii for further details.

The Project is designed to complement renewable energy sources such as wind and solar power. By storing excess energy generated during peak production times, the Project system helps balance supply and demand. The Proponent is currently in talks to co-locate additional renewable energy infrastructure on-site such as a battery energy storage system and solar panels to integrated renewable energy ecosystem and reduce the Project's energy deficit.

ii Health concerns around EMF

Electromagnetic fields (EMF) are found wherever there is electricity and are common in the modern environment. This includes natural sources such as lightning as well as human sources such as from appliances and powerlines. EMF are highest closest to the source but reduce quickly with distance (TransGrid, 2023).

An existing high voltage 132 kV powerline, Transgrid Line 965, passes through the northernmost part of the Project area. Several lower voltage powerlines for local use are also present. These are the primary EMF sources within the Project area. High voltage transmission infrastructure may induce potentially harmful electric and/or magnetic fields in extreme circumstances; however, this is unlikely as the predicted maximum power-frequency magnetic fields at the boundaries of 132 kV and 330 kV easements are below the interference immunity limit applicable to general electronic equipment in Australia, hence there should be no concern of risk of interference to general electronic equipment outside of the proposed power line easements.

EMF measurements, narrowband measurements, and broadband magnetic field measurements, and radio-frequency interference assessments were undertaken for the Project in preparation for the construction of the proposed high voltage powerline and associated substations. A series of baseline assessments were taken at four nearby properties in proximity to the proposed transmission corridor to determine the existing frequencies of EMF. The baseline assessments determined that, with reference to the levels provided by the Extra Low Frequency (ELF) EMF International Commission on Non-ionizing Radiation Protection (ICNIRP) guidelines, existing levels are well below the limits of human exposure. Additionally, further assessments will be undertaken subsequent to construction. The Project will connect to existing transmission line infrastructure, and new infrastructure will be within the Project area.

iii Climate change and water availability

The reservoirs for the Project will be initially filled with water from the Macleay River, with operational top-ups expected to offset the natural change in storage, as shown in Table 6.4.

Table 6.4 Summary of median predicted water inputs and outputs

Element	Volume (ML/year)
Inflows	
Rainfall on dam and reservoir surface	235
Catchment runoff	155
Groundwater inflows	235
Additional baseflow contributions[1]	15
Top-up from Macleay River	60
Total inflows	**700**
Outflows	
Evaporation from dam and reservoir surface	335
Groundwater outflows	90
Discharge to Macleay River	275
Total outflows	**700**
Change in storage	**0**

Notes: 1. A portion of the losses (due to leakage) from the upper dam and reservoir to the groundwater system is expected to flow into the lower dam and reservoir as additional baseflow contributions.

Using climate projections from NARCliM 1.0 and NARCliM 1.5 for the near future (2020–2039) and far future (2060–2079) within a 10 km grid cell that includes the Project location (Appendix H), it is projected with low confidence that rainfall will both increase and decrease, while more frequent hot days and heatwaves will cause evaporation and evapotranspiration losses to increase. Although the confidence in rainfall projections is generally low, there is high confidence in an increase in the intensity of rainfall events. Time spent in drought is projected with medium confidence to increase over the course of the century.

The combined changes in temperatures, rainfall, and evaporation exhibit varied trends, yet projections consistently indicate an increase in intensities and a medium likelihood of prolonged drought conditions. The Project has considered these variables and can plan for sporadic top-ups to coincide with summer and autumn when higher rainfall is expected.

The water balance model results completed for the Project (Appendix E, SWA) indicate operations can maintain 100% generation capacity in all but the driest historical and current climate conditions. The frequency and length of time in which the Project experiences reduced generation capacity are anticipated to increase under a drying climate. The Project sensitivity to potential climate change and adaptation management measures to address climate driven risks will be further investigated as part of the detailed design process.

Mitigation measures such as lining the reservoirs with asphaltic concrete are being considered in the design to reduce groundwater outflows. Other operational measures to generate in prolonged drought include pumping or filling the reservoir during periods of increased rainfall and filling to occur sporadically rather than continuously.

Climate change has been thoroughly considered in the planning of the Project. A further detailed climate change risk assessment has been completed and appended to this submission report, identifying climate risks to the Project and suggesting measures to improve resilience. The design of uncovered reservoirs, along with residence time considerations and climate projections, ensures that the Project can adequately address the challenges posed by climate change.

iv Waste

A few submissions raised concern regarding the potential for waste and rubbish generation during the construction and operation of the Project. Proper waste management is crucial to minimise environmental impact and ensure the well-being of the local community and ecosystem. Waste generation is anticipated to predominantly occur during the construction phase of the Project, with lesser amounts of waste expected to be generated during the operating phase.

The main activities generating waste will be quarrying and tunnelling, vegetation clearing, and the operation of worker accommodation facilities. The key types of waste that are expected to be generated include general liquid waste, general solid waste (non-putrescible) and general solid waste (putrescible).

As outlined in Section 6.15 of the EIS, the nearest waste disposal facilities are located in Armidale and Kempsey. Various safeguards are proposed as part of the Project to ensure that waste is minimised and managed appropriately, including the preparation of a Construction Waste Management Plan and resource recovery initiatives. The underpinning strategies for management of waste are focused on minimisation through cleaner production, as well as the appropriate training, segregation, storage and safe disposal of waste generated on site. The minimisation of Project waste will be achieved through the following processes:

- consideration of potential waste streams in procurement of materials
- identification and segregation of re-usable and recyclable materials, including on site
- education of workforce on waste identification and avoidance, waste stream segregation and recycling
- processing materials for re-use or recycling

- considering environmental impacts for waste removal and safe disposal processes
- periodical waste monitoring and inspection regimes.

The waste management protocols will include:

- methods, schedules and procedures for the management and responsible disposal of each major waste stream
- methods for monitoring performance against procedures and targets
- documentation on waste disposal methods, locations and quantities
- accountabilities for development, monitoring, control and auditing
- methods to consider re-use and recycling of products.

Vegetation waste will be used in the production of mulch, woodchips or compost wherever feasible, or sold off-site as timber. Excess vegetation may be disposed off-site, or stockpiled and subject to controlled burning at suitable locations

Recycling storage areas will be provided throughout the site to ensure that material suitable for recycling is appropriately classified and stockpiled in covered storage areas. General co-mingled waste will be stored within large bins throughout the site, before being collected and transported off-site by appropriately licensed waste contractors. Some inert waste may be placed in spoil disposal areas.

Putrescible waste (such as food) will be segregated in large, covered, designated waste containers and transported off-site by appropriately licensed contractors. Excess asphalt will be reused wherever possible, or otherwise transported off site by appropriately licensed waste contractors for off-site recycling.

Grey water and sewage will be captured and treated on site at an in-situ wastewater treatment plant. A second wastewater treatment plant is proposed to capture and treat liquid waste from the concrete batching plant. A variety of facilities will be constructed to manage surface water runoff, such as sediment basins, diversion channels, diversion bunds and outlet structures. Hazardous wastes (e.g. oil filters or chemical containers) generated will be classified and stored within sealed and bunded storage areas prior to being removed and disposed in accordance with regulations and guidelines.

v Cumulative impacts

The EIS performed a screening exercise of future projects aligned to the scoping assessment presented in the guidelines (see Table 6.52 and Table 6.53 of the EIS), focusing on key matters that could be materially affected to inform the cumulative impact assessment. Consequently, the screening of projects has primarily focused on potential cumulative impacts during construction (~2025–2030), with long-term cumulative impacts considered less likely at a regional scale.

The remoteness of the site and its distance from other major projects limit the potential for significant direct and indirect cumulative impacts. A cumulative impact assessment has identified future development projects in the region that have the potential to interact with the Project. This assessment reviewed available information relating to environmental and social impacts. Potential cumulative impacts associated with the Project have been addressed through relevant specialist assessments in the EIS.

Those technical assessments take into account the known projects being undertaken. Other projects not yet at the same stage of planning and assessment would need to take this project into account in their cumulative assessments as enough detail is not currently in the public domain for this assessment to take those projects into account.

For instance, the Project will be assessed as part of the cumulative impact assessment for any associated works required for upgrades of TransGrid line 965. Clause 20(2)(b) of Schedule 5 of SEPP (Planning Systems) includes transmission works. This means that any assessment process undertaken by Transgrid will need to comply with Part 5 of the EP&A Act and the Department's guidelines, as well as the SEARs. Crucially, this separate assessment will include consultation with the community and stakeholders, considering visual aspects (including pole choice and design), as well as social and economic concerns. It will also take into account cumulative impact assessment, considering the impacts represented by the main OMPS project.

The Project, while aiming to contribute to renewable energy goals, recognises the potential for visual and environmental impacts on the local landscape. To manage these impacts, the project has included extensive environmental planning and impact mitigation strategies. However, it is understood that these measures might not lighten the concerns of those who value the natural beauty of the countryside. In response to such concerns, a collaborative approach is being undertaken. This involves working closely with councils, developers, government agencies, and other stakeholders to ensure a balanced development that respects the environment while meeting renewable energy needs. Specific measures include careful site selection, minimising land disturbance, and incorporating landscape restoration plans post-construction. These strategies aim to preserve as much of the natural landscape as possible and rehabilitate areas affected by construction activities.

The regulator's role in coordinating investment in Renewable Energy Zones (REZs) is crucial. Efforts are made to deliver long-term benefits to communities hosting energy infrastructure, which includes addressing both REZ-wide impacts and opportunities. This coordination aims to mitigate cumulative visual impacts and ensure that the countryside retains its aesthetic and environmental value.

The assessment of water impacts is a critical part of the Project evaluation. The determining authorities and relevant government agencies consider each project's impact on water availability as part of the licensing process. Surface water sources near the Project are managed under the *Water Sharing Plan for the Macleay Unregulated and Alluvial Water Sources 2016* (Macleay WSP). All streams within the Macleay WSP are classified as unregulated, and users generally rely on natural flows for water supply. This includes the townships of Bellbrook and Willawarrin downstream of the Project. The largest downstream water user is Kempsey Shire Council, which holds approximately 73% (10,141 ML) of the entitlements in the downstream water source. The nearest downstream water user for irrigation purposes holds a 12 ML water entitlement approximately 16 km downstream, and the nearest downstream water user for town water supply is the township of Bellbrook, approximately 60 km downstream.

Water extraction during operations will occur due to the interception of local catchment runoff by the Project dams and reservoirs and via extraction from the Macleay River for operational top-up. The water balance model was used to calculate licensing requirements associated with water extraction during operations. Extracting water for construction, initial one-off storage fill, and periodic operations is not expected to impact the security of water supply to downstream users significantly. The maximum annual extraction volume during construction (6,865 ML in construction year 4) represents, on average, 1% of the annual streamflow volume in the Macleay River adjacent to the Project area, which is a negligible impact on the water available to downstream users. High-flow-only access rules will be applied to the initial storage fill and operational top-up, ensuring a minimum of 597 ML/day available for downstream users when extraction occurs at higher pump rates. Extraction at lower pump rates (e.g. 1 ML/day) is expected to result in less than a 1% reduction in available streamflow under most conditions. Only general construction water will be extracted (at lower rates of up to 1 ML/day) when streamflow is below the 235 ML/day used to define Kempsey Shire Council town water supply restrictions. Hence, an increase in the time and frequency of water restrictions is not expected as a result of the Project.

A water licensing strategy has been developed for the Project, detailing water extraction mechanisms, the volume of entitlements required, licensing options, preferred strategies, and the proposed regulatory pathway to obtain the required entitlements (see Chapter 10 of Appendix M to the EIS). The strategy demonstrates that there is an adequate and secure water supply available to the development. Additionally, contingency has been incorporated into the volume calculation for any licensing strategies. A nominal 20% buffer has been applied to the total annual Specific Purpose Access License volume to account for potential losses or an extended construction program. A summary is provided in Table 4.1 of the EIS with reference to the WM Act.

Water requirements for the Project have been identified and will primarily be met from surface water sources, with the main source for the initial storage fill being unregulated flows from the Macleay River. The prepared water licensing strategy demonstrates that water supply from both surface and groundwater sources can be appropriately managed throughout the Project lifecycle. The water assessments conclude that while local effects will occur as a result of the Project, the regional effects on catchment surface water flows, catchment water quality, and regional groundwater resources are insignificant. Management and mitigation measures will be employed during construction of the Project to minimise potential impacts, with ongoing monitoring to validate the effectiveness of those measures.

Cumulative impacts have been comprehensively assessed and considered to ensure that the Project's effects are managed and mitigated effectively, aligning with regulatory requirements and community expectations. The remoteness of the site and its distance from other major projects limit the potential for significant direct and indirect cumulative impacts.

6.5 Merits of the project

6.5.1 Project Justification

- Support for the Project and the benefits it would deliver for the local area.
- Energy efficiency of the Project, namely in relation to:
  - Being weather dependant for recharge.
  - Intolerable load on the electricity grid to recharge reservoir capacity linked to the inefficiency of storage for pumped hydro and the net efficiency of pumped hydro being negative.
  - Better storage technologies.
- Energy prices and consumer impacts including:
  - Success dependent on adequate supply of electricity generated from the unreliable sources of wind and solar.
  - Reliability of supply.
  - Renewables not delivering cheaper electricity.
  - Public funding for private company profit and the burden on the taxpayer.
- Project cost and investment, in particular in relation to transmission line costs, previous options on a pumped hydro scheme in this area, coverage of costs and cost recovery, Kempsey Armidale Road costs and impact on tax payer funded infrastructure, cost overruns, other project costs and foreign ownership.
- Merits of renewable energy, and support for the transition to renewable energy and decarbonisation of economy, system resilience and help keeping prices down.

i Economic growth

Economic growth was reflected in five submissions of positive comments and support for the Project generally. This includes the statements:

> I support Oven Mountain Hydro as a close Landholder for the potential jobs and infrastructure it will bring to the region.

> I live very close to this project and very much support it as I feel it will be very good for our community.

Great to see local power generation that's green. Jobs and stable power are important for the future. It just seems right.

The project is a "business generating project that ultimately will assist the environment once coal fired power stations are decreased. I can see only a win-win view if this project is to be completed."

The project will provide great benefit for the local and greater community.

ii Energy efficiency

a Weather dependant recharge

The efficacy of the Project was questioned on the basis that recharge is weather dependant. This is only partially the case. During operation, it is anticipated that operational "top-ups" are required to offset system losses due to evaporation and seepage. Operational top-up is only required when evaporation losses exceed monthly rainfall/runoff volumes from the local catchment. More operational top-up is predicted to be required in spring and summer when evaporation rates are higher compared to autumn and winter when evaporation rates are lower.

Based on operational water balance modelling (Appendix E, SWA Section 7.2), operational top-up is predicted to be required in most years and the maximum annual top-up volume is estimated at 130 ML/year. It would take approximately 26 days of pumping at 5 ML/day or 2 days of pumping at 86.4 ML/day to achieve the maximum annual top-up volume of 130 ML/year. This top up volume (130 ML) represents 0.01% of the average annual streamflow volume adjacent to the Project area.

The predictions discussed above are based on the updated operational water balance for the Project and consider cease to pump rules (see response in Section 6.4.9 or Appendix E, SWA Section 5.5.5) which have been developed to reduce impacts to downstream users and the environment during low flow conditions. The findings show that operations can maintain 100% generation capacity in all but the driest historical and current climate conditions. The frequency and length of time in which the Project experiences reduced generation capacity are anticipated to increase under a drying climate. The Project sensitivity to potential climate change and adaptation management measures to address climate driven risks will be further investigated as part of the detailed design process.

b Recharge electricity requirements

Submissions were received that stated that electricity required to pump water to recharge the upper dam is more than the electricity that will become available from the Project. There was a concern that grid generation capacity would have to be more than doubled to accommodate the storage recharge.

There are a few issues to address in this concern, principally, whether the electricity usage for the Project is justifiable, and whether the grid has the capacity to accommodate that usage.

It is a valid observation that pumped hydro schemes use more electricity than they store and release back to the grid. The Project is forecast to purchase 2,022,000 MWh/year from the grid. It will supply to the grid 1,577,000 MWh/year. This means that the "cost" (in terms of energy consumption) of running the Project is 445,000 MWh/year. This means that the Project has an approximate efficiency of 78% or rather, that 78% of the energy consumed is converted and stored to be released to the grid at times of high demand.

This shows that there is an energy cost to running a pumped hydro scheme. The energy it produces is less than the energy it takes, in this case, by 22%. The issue however is whether that cost is justifiable.

The answer to this lies in when that energy is available and when it is needed. A pumped hydro scheme recharges when energy is available, but demand is low. It then releases energy back into the grid when energy demand is higher than the energy available in the grid. This is shown in the figure below.

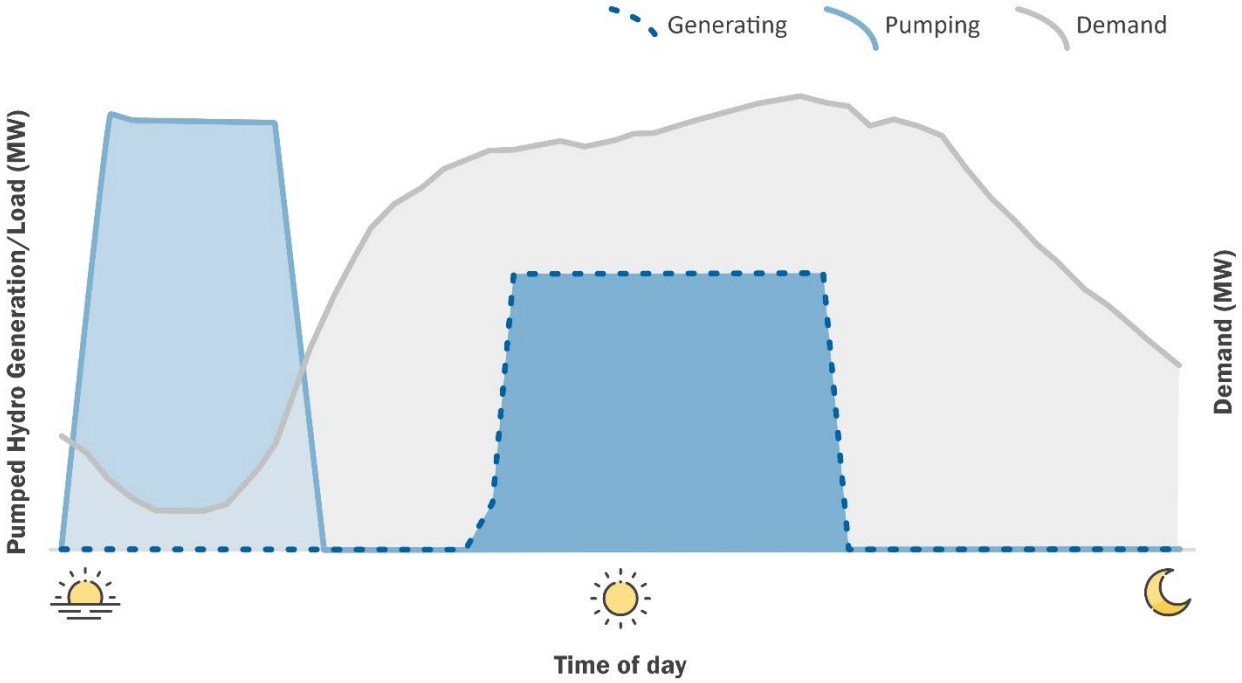

Figure 6.1 Conceptual energy use and generation model (based on the NSW Pumped Hydro Roadmap Figure 6)

In terms of whether that is justifiable, the Australian Energy Market Operator (AEMO) updates its 10 year outlook every year. The latest available at the time of writing is the 2023 Electricity Statement of Opportunities. This shows that reliability of energy supply is a key concern, with coal and gas generators to be retired by 2033, delays in delivery of new infrastructure, and with a forecasted increase in energy demand.

As such, pumped hydro, in concert with wind and solar, is focused on provision of reliable on-demand supply which is recognised in Commonwealth and State energy strategies.

In terms of the capacity of the grid that the scheme will draw from, as shown in the conceptual figure above, the Project will draw from the grid when demand is low and there is least pressure on grid capacity. Further, the Project is part of the NEW England Renewable Energy zone which has an intended capacity of 8 gigawatts across multiple renewable projects. This is a long-term regional project with construction of various projects from 2031.[3] It is anticipated that the Project would be operational by about 2030.

[3] https://infrastructurepipeline.org/project/new-england-renewable-energy-zone

Source: EnergyCo 2024

Figure 6.2 New England REZ

c Better storage technologies

Some submissions noted that there are better storage technologies. This suggests that there is a concern as to the justification of this Project and its scale when compared to other technologies.

As Australia moves to retire coal and achieve net zero by 2250 through the replacement with renewable energy, a large upscale in energy storage is needed. CSIRO's Renewable Energy Storage Roadmap notes that with a transition to renewables, a large upscale in storage is needed to smooth the peaks and troughs of energy dependant on natural resources. To support net zero, 550–950 GWh of dispatchable storage by 2050.

There are a range of technologies available including electrochemical (batteries), mechanical (e.g. pumped hydro), thermal and chemical.

Pumped hydro is the most widely used storage technology and the most mature. In 2022, the global pumped hydro capacity was over 137 GW across 160 countries. As such it is a known technology and a reliable source of storage and generation on a large scale.

Grid-scale batteries are the other technology that is coming to the fore and will be key in the transition to renewables. At the time of writing, there are 14 approved Battery Energy Storage System (BESS) projects approved in NSW which collectively provide just over 8 GWh of storage. These projects are located all over NSW with around half of them related to Renewable Energy Zones, but none in the New England REZ. There are another 43 BESS projects in the development approval pathway. These also are located all over the State.

So, BESS projects are good but not yet at a scale or at a construction and operation stage that could provide more energy storage capacity.

What is clear in AEMO's 2023 Electricity Statement of Opportunities report is that a combination of storage options is needed to both meet goals and support reliability of supply, just as a combination of generation options are needed to provide a complete demand baseline.

The New England REZ has an intended capacity of 8 GW through a variety of wind and solar projects. This would be supported by both pumped hydro storage and generating capacity as well as BESS projects. This is the same combination of generation and storage that is occurring in other REZs.

iii Energy prices and consumer impacts

a Success dependant on unreliable electricity sources

One submission noted that the success of the Project was dependant on an adequate supply of wind and solar generated electricity, which are themselves unreliable. It is a valid point that pumped hydro schemes are ultimately more "successful" in energy usage and circular economy terms if the power they are drawing on comes from renewable sources such as wind and solar. The intention within the New England REZ is that gradually renewable schemes will populate the grid rather than fossil fuel sources. Those schemes, while not yet announced, are planned to be in construction by 2031.

Until that time, the Project will draw energy from the grid for its operation. The Proponent will be exploring the feasibility of a small solar farm and/or BESS co-located at the site to provide onsite generated renewable sources to support operation and this type of circular economy design feature would enhance the success of the Project. However, the success of the Project is its ability to operate at capacity and provide energy storage at its planned levels. Its operation at capacity is not dependant on what type of energy is in the grid initially.

b Supply reliability

Community submissions raised a concern about supply reliability, particularly in relation to lived experience of brown outs and blackouts.

Blackouts are when there is a complete power outage because of extreme weather, major technical issues or fallen power lines. Brown outs are when electricity grid has reached capacity and electricity supplier reduces flow to avoid blackout. Typically, this occurs at the height of winter or summer when the majority of the population is using heating and cooling systems that place extra strain on the grid. During a brown out, lights might dim or flicker and appliances might switch on/off again, including internet connection.

It is recognised that this submission comes from real lived experience and the concern that the Project will either interrupt the energy available in the grid or draw so much energy in the grid that it forces blackouts or brown outs in the region.

As shown in Figure 6.2 above, the Project will draw energy from the grid when demand is low. This avoids the type of pressure on the grid that would precipitate a brown out.

Separate to the electricity consumption issue, the goal of the Project is to store and generate energy to put back into the grid at times of high demand, thereby supporting supply reliability. This is the aim of all storage projects (whether pumped hydro or BESS) and is the goal of government policy to provide consistency of supply at times of peak demand.

The Project will be able to generate 900 MW at minimum operating level of the upper reservoir and approximately 110 MW at maximum operating head. It will store 7,200 MWh of energy, equivalent to generating 900 MW for 8 hours. Therefore, barring upstream technical issues in the grid or fallen poles et cetera, will be able to provide reliable supply to over 600,000 homes.

c Transmission losses

One submission identified transmission losses as another reason the Project is inappropriate.

AEMO notes that "approximately 10% of the total electricity transported between power stations and market customers."[4] That doesn't mean that 10% is lost in every transmission and distribution line, this is the cumulative loss of all power across the network. The higher losses are experienced on the lower voltage distribution networks rather than higher voltage transmission lines and is exacerbated by distance and heat.

There can be a concern that transmission losses either make the project unviable, but the rate of transmission loss is extremely small and not enough to outweigh the ability of the project to provide capacity and supply resilience and reliability.

Loss factors are common to all power sources across the network but are well understood and planned for. The potential losses for the project are anticipated to be small (in the order of 5%) as the project is ideally located between two major load centres (Sydney and Brisbane), and significant regional load centres of Armidale, Coffs, Kempsey and Port Macquarie. The project is comparable or better in terms of distance to other pumped storage projects already approved (such as Kidston and Snowy 2.0).

d Electricity prices

Several submissions raised the concern that the project would increase their cost of electricity. This is an understandable concern since electricity prices have increased by on average by 20% in the last year.

Electricity prices are made up of a number of factors but are regulated by the Australian Energy Regulator (AER). The AER sets the Default Market Offer (DMO) each year which is the maximum price that an electricity company can charge. As such it sets a ceiling and is not necessarily the best offer that an electricity company will provide. Most customers are on a market offer (that is a plan provided by their electricity provider that is lower than the DMO, the price of which is determined by competition in the market). While only about 10% of customers are on the DMO with their provider, it nonetheless provides good insight into what makes up the energy costs that we all pay for.

About 35–45% of our bills are the wholesale electricity cost and wholesale price increase is related to various factors, reports the Independent Pricing and Regulatory Tribunal (IPART) including:

- the more expensive electricity futures contracts that were traded before the temporary fuel price caps came into place
- relatively stronger coal and gas costs compared with previous years
- reliability issues with coal-fired generation assets
- the closure of the Liddell Power Station in NSW in April 2023
- the increasingly peaky shape of customer demand.[5]

In 2023, while the overall DMO increased by 20%, the wholesale portion of the DMO increased by approximately 50%.

Within the DMO which is set by the AER to cap how much companies can charge, electricity companies set the prices that make up our electricity bills. These bills have seen around a 20% increase since 2023.

[4] https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/market-operations/loss-factors-and-regional-boundaries

[5] https://www.ipart.nsw.gov.au/1-july-2023-electricity-price-increases

According to the AER's Default market offer prices Draft determination (March 2024), prices are expected to begin falling in 2024 by a small amount. The competing factors driving the scale of the price change is a stabilisation in wholesale availability in the positive, but network costs driving the negative. The network costs are driven by "adjustments for recovery of revenue in prior years, updated capital and operating costs, CPI and interest rates, and, for the NSW networks, the NSW Renewable Energy Zone roadmap cost contribution allocations (determined and gazetted by the AER annually)" (AER 2024:3).

In this sense, projects such as this Project do contribute to price changes, but this Project is part of one Renewable Energy Zone, which sits within the NSW Renewable Energy Zone roadmap costs, which is one part of the drivers that change network costs.

With specific respect to this Project, a study was commissioned specifically for the Project for an economic assessment by Ernst & Young (EY) to assess the potential impacts on the network and costing to the customer.

EY undertook a market benefits study comparing the projected market outcomes in 2030–31 with and without the Project in operation. The market benefits study showed that in 2030–31, the Project is projected, based on modelling, to:

- Reduce demand-weighted wholesale electricity prices by $7–9/MWh in NSW and $4–5/MWh in the other mainland regions. This amounts to approximately a $1 billion reduction in total mainland customer retail bills.
- Produce $50–70 million savings in fuel costs NEM-wide.

EY also looked at what is called the Insurance Case Study. That is the potential benefits of the Project as a form of insurance in the case that the New England REX link is delayed until after 20302031. In this case the Project:

- Reduces demand-weighted wholesale electricity prices by $6/MWh in NSW and $12/MWh in Queensland. This amounts to approximately a $1.3 billion reduction in total mainland customer retail bills.
- Saves $60 million in fuel costs NEM-wide.
- Saves 540,000 tonnes CO2-e in generation emissions (a 1.3% reduction).
- Reduces curtailment of New England wind generation from 32% to 29% of available energy, and from 33% to 27% for solar PV generation. In total the Project is forecast to allow approximately 680 GWh of additional renewable generation to be dispatched in New England.

e Project funding

Several submissions raised a concern as to how the Project is funded and specifically that it uses tax payers money to fund private projects.

The Project has cost $50 million to date which includes design, assessment, optioneering, consultation, approvals and so on. It is anticipated that the Project will cost $1.97 billion to design and construct.

A small portion of the Project has come from public funds. The Commonwealth Australian Renewable Energy Agency (ARENA) provided $951,000 in April 2020 to support a feasibility study. In addition, the NSW government provided $10 million to the Project in September 2022 under the NSW Pumped Hydro Recoverable Grants Program. Under this program, the NSW government has given $50M to 6 pumped hydro schemes with a combined capacity of 2.56 gigawatts. These projects include:

1. Lake Lyell (EnergyAustralia Development)
2. OMPS (OMPS Pty Ltd)

3. Shoalhaven Hydro Expansion (Origin Energy)

4. Central West Pumped Hydro (ATCO Australia Pumped Hydro)

5. Muswellbrook Pumped Hydro (Muswellbrook Pumped Hydro (AGL and Idemitsu joint venture)

6. Phoenix Pumped Hydro (ACEN Australia).

The public funding received by the Project was used to develop the Project through the feasibility studies and preliminary design stages. The feasibility and preliminary design stages cost considerably more than the funding received under the Recoverable Grants Program. That cost was borne by the Project, which continues to be the case.

It is appreciated that a comparison with the Snowy 2.0 project is forefront in people's minds since the media coverage of Snowy Hydro's cost extensions. However, the key difference is that this Project is a private project and so while has the benefit of some government funds to encourage advancement in renewables projects, this is by no means the majority of costs.

The cost to date has been $50 million of which $10.5 million has been publicly funded as noted above. The remainder has been privately funded by OMPS.

iv Project cost and investment

a Transmission line costs

Concern was raised that the cost of transmission line upgrades would make the project unviable.

The EIS noted that the project will connect to the existing transmission network via new overhead high voltage transmission lines. The project includes an approximately 15 km long transmission alignment comprising, at a maximum, double circuit single tower 330 kilovolt (kV) overhead infrastructure and single circuit single tower 132 kV overhead infrastructure, including associated transmission tower sites and easement, substation and switchyard.

The Project intends to transmit and receive power by connecting to an existing Transgrid transmission line that runs between Kempsey and Armidale, known as Line 965. The Project includes the establishment of a transmission connection to Line 965, including the construction of a substation and connection infrastructure, access roads and transmission lines rated up to 330 kV. An upgrade of the existing section of Line 965 from the Project to Armidale will be subject to a separate application under the EP&A Act. The upgrade to Line 965 will be undertaken by Transgrid as noted in Section 6.3.3i. The cost of the upgrade to Line 965 would be borne by Transgrid and, if formally declared as a Renewable Energy Zone project, by EnergyCo.

b Previous options on a pumped hydro scheme in this area

One submission noted that Lendlease previously took an option on this pumped hydro scheme but decided against proceeding because the cost of the power lines would be prohibitive.

Alinta is not privy to information regarding Lendlease's historic project portfolio and so cannot comment on the design, options or funding model contemplated by them or any other company.

What Alinta can comment on is the economic viability of this project, and the transmission components (which are discussed in Section 6.3.3i).

Alinta is focused on ensuring the project is socially, environmentally and financially sustainable. The investment made in this project demonstrates Alinta's commitment to creating a deliverable and financially viable scheme.

c Coverage of costs and cost recovery

Three submissions noted that the project would be expensive, cost prohibitive or lacking in detail about how costs will be recovered.

Cost recovery of all pumped hydro projects is by way of:

1. Merchant: Arbitrage margin is earned by pumping water during periods of low (or negative) wholesale electricity costs and by releasing water to generate during high price period. In addition, pumped hydro projects can earn returns by selling $300/MWh caps, which generate returns regardless of the electricity price, subject to the ability of the project to "defend" those caps by generating electricity when the wholesale price exceeds $300/MWh.

2. Offtakes: The Project will sell capacity contracts to investment credit offtakers. These "Virtual Storage Agreements" will allow the offtakers access to merchant revenue streams (as described above). In return, the Project earns a fixed return (subject to specified adjustment triggers over the life of the agreement).

3. Network and Ancillary services: These are of two types, namely, those where there is an existing dispatch market (such as Frequency Control Ancillary Services) and others that are subject to term contracts (such as Network Stability and Control Ancillary Services). These services are purchased by AEMO.

However, this is a slow process and can take 40 years or more for the capital investment to be realised. This is because of the capital intensive nature of these projects compared to the realisable margins. The economic viability of a project such as this lies in its longevity. Pumped hydro schemes have a lifespan of approximately 100 years and so once costs are recovered, there is a viable economic outlook for project owners and investors in the long term. The initial cost is high and, in this case, is a private investment so the coverage of the costs is by Alinta Energy and its banks, supported by Government funding where available.

d Other project costs

Two submissions raised other kinds of costs: One on social cost and the other on the time cost of construction.

The Social Impact Assessment (SIA) in the EIS identified several potential impacts accruing particularly in the local area but also in more urban areas across the region. In terms of social cost, these related to:

- sense of community and social cohesion during construction
- decline in rental affordability and availability for residents during construction
- reduced supply of short-term and emergency accommodation for vulnerable groups during construction
- reduced availability of tourist accommodation during construction
- traffic-related increase in public safety risks during construction
- traffic congestion and road delays during construction
- reduced amenity at recreational areas and facilities during operation.

In addition, during consultation with the local community, various issues were raised which related to the social cost (as distinct from environmental cost) of the project including:

- amenity issues including noise from vehicles and construction works, and visual impacts
- social issues such as community cohesion, housing availability and recreational uses.

The SIA acknowledges the social cost of the project, particularly in the construction phase within which the majority of the impacts arise. Since the EIS, and the progression of design (including constructability planning), The proponent has developed further mitigation to ease the social cost of the Project. These include the following:

- The addition of fly camps (or temporary camps) to house construction workers while the main construction accommodation camp is being built. This is aimed at easing pressure on the local rental market and short term accommodation (including tourist accommodation) during this early phase. This is aimed at having the secondary protective measure of reducing pressure on rental affordability by reducing the demand/competition for accommodation.

- Alinta are exploring the increase in capacity of the main accommodation camp to further reduce pressure on the local housing market. If this is a viable option, a consistency assessment would be undertaken against the EIS to reveal if there are any additional impacts and, if there are, then a modification would be prepared for submission to DPHI.

- Detailed community and stakeholder consultation plans have been developed that build on the EIS, to ensure that amenity impacts, and mitigation and management measures can be relayed clearly to the public. This will also ensure a clear communication path for the community to voice concerns to Alinta, with a clear feedback and resolution process for Alinta to respond.

- Alinta will be entering into a Voluntary Planning Agreement (or similar) with ARC and KSC.

The other issue raised in this category is the time cost of construction. It is acknowledged that the social cost discussed above is forecast to take place over 5 years. Contractor mobilisation for the construction of access roads is forecast to occur in mid-2025 with dry and wet commissioning forecast to commence in mid-2030. The figure below shows where the main phases of construction and commissioning.

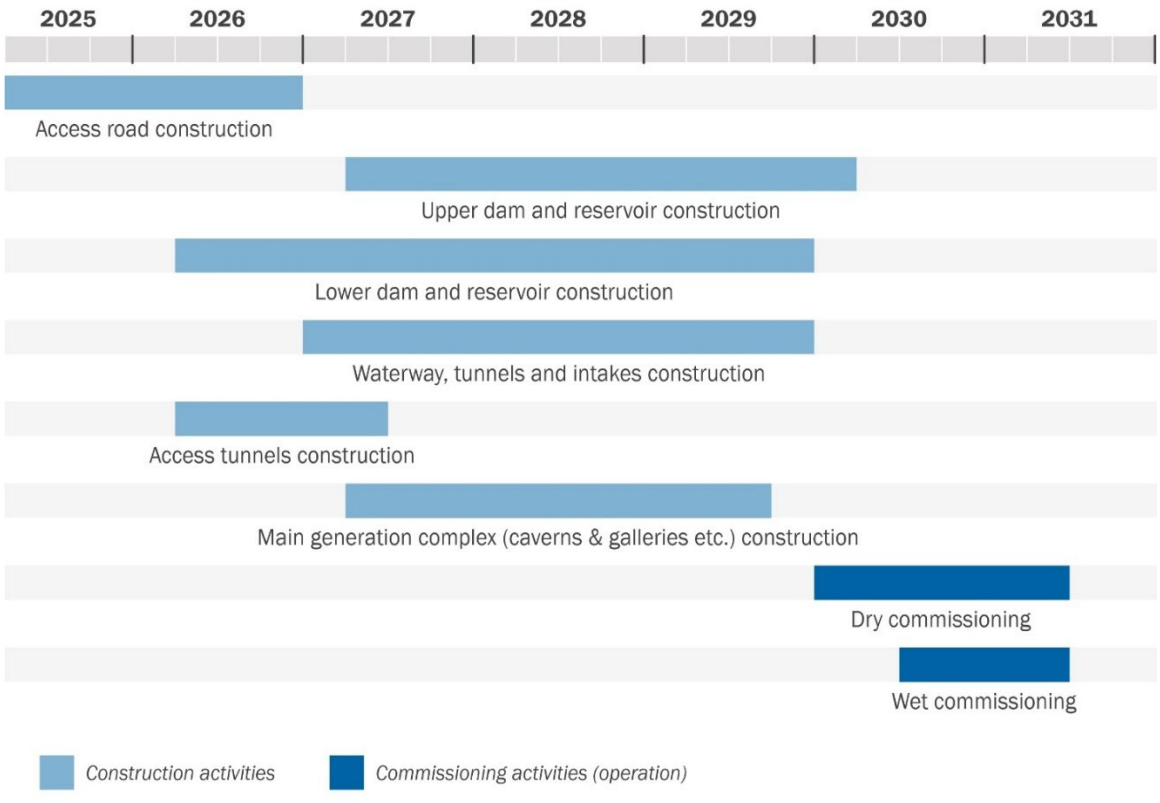

Figure 6.3 Overview of main construction activities and commissioning timeframe

There is a definite time cost to the community from major project development. The number of years the construction extends is the number of years that the community has to bear impacts to their daily lives and routines. The aim of the SIA is to identify, through research and through interviews and consultation, those impacts that are High, Medium and Low and identify where those risk ratings can be lowered through refining the project, amending construction plans or through mitigation and management.

The Project presented in the EIS was based on feasibility assessments and preliminary designs which forecast the construction to be undertaken in 4–5 years. Since the exhibition of the EIS, further constructability assessment and concept designs prepared by the Project's engineering and design consultants including AECOM, Lombardi, SMEC, Beca, Praxis and Local Government Engineering Services have been undertaken. This progressed work identified the construction would take approximately 5 years to complete with an additional year for commissioning. Based on this time cost, Alinta has looked at means of reducing that time to the timeframe identified in the EIS. Four key changes to achieve this include the following:

- Introduction of a temporary bridge to the north-east of Georges Junction (the Western Access Temporary Bridge). This will allow the construction of the Eastern Access Road (EAR) from both the eastern Kempsey Armidale Road end and the western end, and earlier commencement of construction of the Main Access Road (MAR) and Main Access Tunnel (MAT) portal. This will reduce the construction timeframe of the EAR by approximately 9 months compared to its original construction duration.

- Introduction of a temporary bridge at Smiths Bluff (the Eastern Access Temporary Bridge). This will allow the construction of the permanent bridge across the Macleay River to commence from both its eastern end and the western ends, and facilitate earlier commencement of construction of the permanent bridge over Carrols Creek. This will reduce the construction timeframe of the EAR, which will reduce the overall timeline and critical path of the Project.

- Use of the Carrai access road for mobilisation at the Upper Reservoir for construction of the UDAR.

- Selective use of directional blasting in the construction methodology to for the internal access roads given the difficulty of the geology and terrain.

Both of these changes are fully assessed for their potential impacts in the Amendment Report. The issue of note here, however, is the active development of project amendments with the specific view of reducing the time cost where it is appropriate and safe to do so.

e Kempsey Armidale Road costs and impact on taxpayer funded infrastructure

Four submissions raised concerns around the costs to public infrastructure, including the Kempsey Armidale Road and financial impacts to Council and impost on taxpayers.

As noted in Section 6.3.3ii, the KAR approvals and works will be undertaken by Armidale Regional Council and Kempsey Shire Council with funding from Alinta.

Separately, with regard to funding for other amenities and infrastructure that might be impacted by the project, the EIS noted that:

> OMPS will enter into Voluntary Planning Agreements (VPAs), or similar, with Armidale Regional and Kempsey Shire councils generally in accordance with Division 7.1(a) of Part 7 of the EP&A Act and/or community enhancement schemes. OMPS have presented details of the VPA to both councils and it is OMPS' intention that a heads of agreement on those details will be finalised prior to determination the project by the Minister for Planning. Once the VPAs have been formalized, payments to the councils can then be directed to a range of community infrastructure needs and programs.

A voluntary planning agreement is, among other things, a monetary contribution "to be used for or applied towards a public purpose" as noted by Section 7.4(1) of the EP&A Act. A "public purpose", Section 7.4(2) notes, can include any of the following:

a) the provision of (or the recoupment of the cost of providing) public amenities or public services

b) the provision of (or the recoupment of the cost of providing) affordable housing

c) the provision of (or the recoupment of the cost of providing) transport or other infrastructure relating to land

d) the funding of recurrent expenditure relating to the provision of public amenities or public services, affordable housing or transport or other infrastructure

e) the monitoring of the planning impacts of development

f) the conservation or enhancement of the natural environment.

As noted in Section 4.1.6, the HoA has already been signed with Kempsey Shire Council and the HoA with Armidale Regional Council is currently in negotiation.

f Cost over runs

Six submissions raised concerns over cost over runs, citing Snowy 2.0 specifically as a basis for concern with original estimates for that project being far less the current estimates.

It is true that the current estimated total cost of Snowy 2.0 is over $12 billion resulting from various issues including the Covid-19 pandemic, skills and materials shortages causing delays, inflation in construction material and labour costs.[6] The original cost in the Snowy 2.0 EIS was $4.6 billion.

There is a key difference between the OMPS project and Snowy 2.0. Snowy Hydro is a Commonwealth-owned public company. The Australian Government committed up to $1.38 billion in equity for Snowy 2.0, with Snowy Hydro funding the remainder of the project. Snowy Hydro gets its funding from its operation of the existing Snowy Mountains Hydro-Electric Scheme which includes retailing energy in the National Energy Market.

OMPS Pty Ltd is wholly owned by Alinta Energy. As such, any cost blowouts (should they occur) would be borne by Alinta.

So while the concern based on the Snowy 2.0 project cost blowouts is appreciated, any cost blow out, should it occur, in the Project, would be borne by the Proponent (and its private shareholders), not the government (and thereby the taxpayer).

v Renewable energy

6.5.2 Project alternatives

- Alternative technologies such as batteries provide more cost-effective solutions
- Alternative PHES sites should be considered including brownfield sites

6 https://www.snowyhydro.com.au/news/securing-the-future-of-critical-energy-transformation-resets/#:~:text=The%20estimated%20total%20cost%20for,to%20date%20of%20%244.3%20billion.

i Other long term storage methods

The availability and advancement of technology for long term storage batteries was raised by a large proportion of submitters as an alternative to the Project. Comments related to the dated nature of PHES technology and the improved energy and cost-efficiency of batteries (and other renewables) when compared to PHES, as well as having lesser environmental impact. One submitter suggested that coal, gas and nuclear power are superior and essential instead of PHES.

Due to the intermittent nature of renewable technologies, long term energy storage is needed to provide firming capacity to the NEM. Both PHES and batteries are needed in combination to provide this stability. The Australian Energy Market Operator (AEMO) releases its Integrated System Plan (ISP) every 2 years. The latest was released as a final document in June 2024. Previous ISPs focussed on investment in renewable projects to meet targets – that is, having a net zero economy by 2050, with a 43% reduction in 2005-level emissions by 2030, with 82% of energy provided from renewable sources. This latest ISP focuses now on delivery of those projects with an optimal pathway set out for the needed generation, firming and transmission to support the transition.

Pumped hydro projects are integral to those objectives with the ISP noting that "the optimal mix of generation and storage, including renewables such as solar and wind as well as firm capacity technologies like battery storage, pumped hydro and gas-fired generation."

The ISP notes that utility scale batteries, which are already being constructed across the national electricity market, are designed to dispatch energy instantaneously. Pumped hydro provides a longer term storage and dispatch role, providing much more security in the network. Utility scale batteries also have a relatively shorter life-span with many requiring replacement by the 2040s. Pumped hydro have a life-span of around 100 years.

There are emerging technologies that could provide alternatives or supplementation to current technologies such as pumped hydro. This includes advanced compressed air energy storage, gravitational storage, flow batteries and concentrated solar thermal systems. However, these technologies are not currently at a stage of development to make them viable for investment, design and operation within the timeframe required to transition to renewables.

ii Other PHES sites

Several submissions raised comments to consider alternative PHES sites (e.g. brownfield sites) due to concerns regarding the proposed location of the Project. Many commented the current site is unsuitable due to its remote and steep location, unrealistic construction costs, hazard risks (bushfire and flooding) and the potential for significant environmental and social impacts.

Due to the nature of PHES and topographical requirements to make the technology viable, schemes are sited amongst steep terrain to gain the hydraulic head needed for generation. A review of potential other locations was explored by the Proponent during the pre-feasibility and feasibility stages of the Project. However, the current location of the Project was favoured due to the significant power generation potential, suitable land tenure, proximity to transmission options and the limited number of receptors. This was balanced against potential cost and environmental and social impacts. A final investment decision for the Project is yet to be made by the proponent.

It is understood that brownfield sites may offer greater opportunity to minimise some environmental and social impacts, however, may also increase impacts in other areas, such as amenity impacts (where located close to residences) and contamination risks (due to historical industrial or mining activities). The proponent is a market generator as well as a retailer and has a portfolio of current and future projects and is carrying out feasibility for other generation and long storage energy systems across Australia. Due the reliability and firming capacity PHES provides the NEM, the Project is unique to provide this firming capacity to the New England REZ and support the development of other renewable energy technologies and projects occurring as part of the energy transition.

6.6 Issues that are beyond the scope of the project

- Objection to the Project based on the Proponent's status as a foreign owned company.
- Amendments to EPBC Act legislation should occur before the Project proceeds.

6.6.1 Foreign ownership

Alinta Energy (owner of OMPS Pty Ltd) is owned by Hong Kong-based company Chow Tai Fook Enterprises (CTFE) and is subject to and complies with strict Foreign Investment Review Board conditions. Alinta Energy has a sole Australia/New Zealand focus with 1,000 employees and around 3 GW of thermal and renewable generation sites and storage assets.

As such, while the company is foreign-owned, the benefit to Australia exists in its assets and contribution to our energy generation demand and in the employment of 1,000 people. This does not include the employment and economic benefits seen in local and regional areas during construction and operation of new projects. As noted in the EIS, the average annual construction impacts of the Project on the regional economy over the expected 5 years of construction are estimated to be up to $248 million in annual direct and indirect output. Construction is expected to generate well over 600 direct and indirect jobs, based on economic modelling. During operational phase, the Project (assuming 100 years of operation) will create $112 million in annual direct and indirect regional value-added, and 95 direct and indirect jobs. The benefits to the NSW economy are forecast to be $128 million in annual direct and indirect value-added, and 198 direct and indirect jobs.

6.6.2 Government responsibility

One submission raised an issue relating to current legislation and the planned future amendment to the EPBC Act, suggesting that the Project should not proceed before the implementation of this amended legislation.

The Project is unable to control the timing and content of proposed legislative changes and when it will be implemented. The Project is required to comply with current legislative requirements. The critical need for the Project has been highlighted within several government policies and will support the transition to a decarbonised energy market.

7 Updated justification and evaluation of the project

This chapter provides an update to the evaluation in Chapter 7 of the EIS. It draws from that chapter, being updated where applicable to the design changes that have occurred since then. In addition, further information to the evaluation is provided on the basis of the submissions received.

7.1 Project objective and need

The Project's objective is to provide vitally needed long duration electricity storage capabilities, ensuring a reliable, resilient, and renewable future energy supply for NSW. It is anticipated the Project will play a critical role in ensuring the stability of the future electricity network, complementing other local renewable energy sources such as solar and wind. This objective and need are supported by the Project's designation as CSSI by the NSW Minister for Planning and Public Spaces.

7.1.1 Supporting the clean energy transition

Changes to the NSW and Australian electricity system and market have rapidly created a need for large scale pumped hydro energy storage projects such as the Project. As with many electricity markets around the world, the NEM is undergoing a paradigm transformation that has been brought about by significant shifts in energy efficiency, rapidly decreasing costs of wind and solar generation, coal-fired power station retirements, increasing coal and gas costs, Australia's participation in global commitments to reduce carbon emissions, consumer choice, and more recently strategic energy security.

Over recent years, as noted in the EIS, the pace of energy transition has pushed the upper bounds of modelled expectations (AEMO 2024), with costs of utility-scale renewable generation continuing to fall and coal closures brought forward. The 2024 Integrated System Plan (ISP) was released as a finalised document by AEMO in June 2024. The transition is in progress and the report notes that it the biggest transformation of the NEM since the NEM was formed 25 years ago. The transition includes the shift from coal to renewables as well as a tripling of capacity to meet future demand. The report identifies pumped hydro as one of the generation and storage technologies that are on an optimal development path. The technology is mature, and they represent a consistent energy source (as opposed to wind and solar which are variable).

While wind and solar generators provide energy during model conditions, the challenge for these sources is they are dependent on weather conditions, and during periods when wind and/or solar is not available or when market conditions are particularly challenging, they may not operate. Pumped hydro energy storage projects help build power system resilience to unfavourable weather and market events by storing surplus renewable generation for use at times when these resources are scarce and allowing more constant operation of less flexible existing generation. This, in turn, creates a more dispatchable and reliable power system, while helping to keep prices down for consumers including by maximising use of existing, low-cost, thermal generation assets.

A large pumped hydro energy storage system such as the Project (with a capacity of 7.2 GWh and capable of delivering approximately 2,500 GWh of annual generation) can provide significant energy storage capable of delivering large-scale generation within minutes at times when variable renewable energy (VRE) such as wind and solar power is not operating. During these times the Project will be capable of meeting the needs of approximately 600,000 to 900,000 NSW households. Studies have shown that the Project is also an enabler of renewable energy being able to support up to 1.6 GW of additional inverter based renewable generation through the provision of grid system strength capabilities.

7.1.2 Consistency with strategic context

The development of the Project is consistent with several Commonwealth and NSW strategic planning and policy objectives. At the Commonwealth level, it is consistent with the *Paris Agreement*, the CC Act, LRET and the 2024 ISP. At the State level, it is consistent with the Electricity Strategy, the Electricity Roadmap, the *NSW Energy Security Target*, the *NSW Climate Change Policy Framework*, the *Net Zero Plan Stage 1 2020–2030*, and the *Pumped Hydro Roadmap*. The Project will directly support objectives of the NSW *Electricity Infrastructure Investment Act 2020*.

In recognition of the need to manage the transition and future energy mix in the NEM, the Project was declared CSSI by the NSW Minister for Planning (now Minister for Planning and Public Spaces) under the NSW EP&A Act in September 2020. As CSSI, it is recognised that the Project is considered essential for the State for economic, environmental and social reasons. It was declared as critical for the energy security and reliability needs of NSW.

On 25 May 2023, the NSW Government announced it had commissioned a team from Marsden Jacob Associates (MJA) to undertake an Electricity Supply and Reliability Check Up. The Check Up was an exercise to identify any additional steps that NSW needs to take to deliver the Electricity Infrastructure Roadmap to ensure a reliable supply of clean, affordable energy. It was necessary given global competition for investment has intensified, supply chain constraints and skills shortages have become more acute, and some regulatory, planning and community issues have become apparent.

On 4 August 2023, MJA submitted the Check Up report to the NSW Government. The report sets out findings across three themes and makes 54 recommendations to the NSW Government.

The Electricity Supply and Reliability Check Up (Office of Energy and Climate Change, September 2023) is the NSW Government response and it notes that progress in the pumped hydro space has been slower than had been anticipated. It also notes that more may need to occur to maintain the focus on execution of these projects.

The Project is within the New England REZ which is expected to be a source of significant energy production as NSW's energy mix shifts to be more reliant on renewable energy technologies. The Project supports the site selection (its proximity to existing electrical infrastructure and the compatibility of its existing land uses with renewable energy production) and energy generation objectives of the REZ.

The proponent has reviewed the pumped hydro energy storage potential of the Project area considering key development attributes including natural terrain, capacity, grid connection, water access, community as well as planning and environmental constraints. The Project area provides optimal conditions for the development of an off river pumped hydro energy storage project and associated infrastructure. As part of Project development, avoidance and minimisation measures have been incorporated (further discussed below in Section 7.4.1).

7.1.3 Key benefits

The key benefits of the Project are summarised as follows:

- It would make a significant contribution to the continued decarbonisation of the economy.
- It provides large-scale energy storages at least cost to allow more flexibility to respond to seasonal variability when compared to other VRE generators and batteries.
- It will improve the overall efficiency and stability of the NEM by absorbing and storing excess energy from the system at times of excess generation (through pumping) and generate at the critical times of peak demand.
- Provide essential grid services to support system stability and security.

- Being a closed loop, off river system, the Project can move water between reservoirs and not rely on natural inflows that may vary seasonally, offering valuable seasonal storage and insurance against drought risk.
- As a 900 MW plant, it will have the capability to run for up to 8 hours continuously before it needs to be 'recharged'.
- It will contribute social and economic benefits to the nearby communities, including employment and business investment opportunities to locals.
- It has a 100 year design life and will operate for generations to come.

The Project would result in benefits distributed to the wholesale electricity market, retailers, and consumers. The scale and centralised location of the Project in the NEM, particularly the newly created New England REZ, enables the system stability, energy reliability and firming capability benefits to be enjoyed by all segments of the NEM.

The results of consultation indicate that the Project has strong support from the community given the economic opportunities it will create for the region, how it will improve the reliability of a transitioning renewable electricity network, help generate lower energy prices and increase and expand sources of reliable, renewable energy to reduce reliance on fossil fuels which will have an overall benefit to the environment.

An economic report commissioned to assess the potential benefits of the Project to the REZ and NEM more generally indicated that in 2030–31 a 900 MW project would:

- Reduce demand-weighted wholesale electricity prices by $7–9/MWh in NSW and $4–5/MWh in the other mainland regions. This amounts to approximately a $1 billion reduction in total mainland customer retail bills.
- Result in $50–70 million savings in fuel costs NEM wide.
- Reduce CO_2-e emissions by 400,000 t in 2030/2031 based on the ISP Step-Change scenario (EY 2022).

7.2 Design development

7.2.1 Design principles

Consistent with the principles of ecologically sustainable development (ESD), the Project has been designed to avoid and minimise impacts where possible. These principles were implemented through an iterative design and assessment approach (known as DIAA), supported by consultation with numerous technical specialists and government agencies with the objective 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.

Throughout the design process, the objective was to identify and avoid sensitive locations where possible, to minimise the disturbance footprint and maintain as much of the existing natural environment as is reasonable and feasible. In the first instance this included environmental conditions and consideration of site suitability based on design and construction needs and existing infrastructure (such as road access). The dam type selection was also based on sourcing the majority of materials required for construction from site (such as aggregate) rather than importing materials.

Since the exhibition of the EIS, further constructability assessment and preliminary designs prepared by the Project's engineering and design consultants including AECOM, Lombardi, SMEC, Beca, Praxis and Local Government Engineering Services have been undertaken. This has resulted in several changes to the Project which are the subject of assessment in an Amendment Report. These changes include many that will reduce impacts including:

- removal of a section of the north-south aligning UDAR which reduces impacts to Brush-tailed Rock-Wallaby habitat
- amendment of design to the spoil emplacement area to increase set-backs around the Bush-pea thereby reducing impacts to this plant species
- introduction of a temporary bridges at the eastern and western end of the EAR, and temporary use of the Carrai Road in order to reduce construction time.

7.2.2 Design challenges

The challenges for the design team included the need to develop solutions that balance the need to protect the environmental values of the Project area with the need for developing a functional pumped hydro system and a safe working environment for the construction phase, including the safe movement of plant, equipment, materials and personnel across the site.

This EIS was based on a concept design provided by experienced engineers in designing pumped hydro systems, transmission lines and access roads. The design was undertaken to a level that suitably informed the creation of a feasible disturbance footprint.

The design has since been further refined on the basis of progressed engineering designs and so the disturbance footprint is greater (as this includes optimised design elements and bridges), but the construction envelope is smaller. This is because there is a higher degree of confidence as design progresses which removes the need for large scale flexibility in the construction envelope.

During detailed design, it is expected that the precise location of the disturbance footprint may move within the broader construction envelope and consequently there will be some further refinements to the disturbance footprint. The construction envelope is the maximum extent within which the disturbance area corridor can move to allow the final siting of infrastructure through the detailed design process.

Construction sites and access roads make use of existing cleared and disturbed areas to the maximum extent possible which has contributed to the ability to avoid and minimise impacts. The design principles also provide for the rehabilitation of disturbed areas.

As stated above, as a result of this process, the design of the Project has been informed and refined by the results of field surveys and consultation with key stakeholders. On this basis, a number of potential significant impacts on biodiversity, cultural and historic heritage, recreation and land use, for example, have been minimised and/or avoided.

7.2.3 Preferred design

Informed by extensive studies since the 1990s, design analysis identified the Project area as the preferred site location for a pumped hydro energy storage development capable of delivering large-scale generation output. Several design arrangements were considered for the scheme, including reservoir locations, reservoir arrangements, dam types, and cycle time, as well as options and alternatives for other design elements such as (but not limited to) intakes, spillway and powerhouse.

The preferred design forms the basis of this Project and has been selected over other proposed development options considered as it:

- has the highest economically feasible hydrological head of any site assessed, thereby minimising reservoir sizes, waterway diameters (tunnelling extent), and scheme water requirements
- has the shortest horizontal distance between the two reservoirs, therefore reducing the amount of tunnelling required (and therefore reducing cost, increasing capacity factor and increasing operational efficiency and responsiveness)
- ensures the hydro generation infrastructure and reservoirs are situated within private property
- allows for further optimisation of power output and energy storage using the same lower dam and reservoir location (e.g. a 900 MW and up to 8 hour cycle time).

Further design and optimisation will need to be performed by a detailed design and construction contractor and informed by ongoing and future consultation for the Project. The design process will continue to utilise the same process approach to minimise environmental impacts where possible.

7.3 Engagement

The proponent has a proactive, adaptive and transparent stakeholder engagement strategy for the Project which aims to meet the needs of a diverse range of stakeholders who have different levels of involvement in the Project and a wide range of interests. A wide range of tools and established communication channels continue to be used to support engagement with the Project such as a dedicate website, 1800 number and email address, regular newsletters and SMS notifications.

Feedback from the local community, local industry groups and special interest groups on the Project is mainly positive, particularly as a result of the many benefits and positive flow-on effects available. Notwithstanding this, concerns have been raised by the community regarding the potential impacts of the Project on local roads, particularly the Kempsey Armidale Road, impacts on nearby Aboriginal cultural heritage sites such as the Carrai waterholes, impacts on historic heritage items such as East Kunderang Homestead, social and amenity impacts, and concerns regarding the transparency of communications with the community.

In response to community feedback, the Project investigated and developed an alternate access road on the southern side of the Macleay River, referred to as the EAR, which could potentially be considered for further developed as a public road in the future if the need arises. Further, a suite of mitigation measures has been identified to help minimise potential social impacts, such as the use of fly camps to reduce pressure on local townships for accommodation primarily during early stages of construction. Feedback from Aboriginal representatives has also been incorporated into the recommendations of the ACHA for the management of Aboriginal heritage sites and places. The Project team have liaised with landowners on different design and access options and continue to work with government authorities to deliver the best outcome for the region.

Engagement with government agencies during the EIS and Submissions Report development has been and continues to be a priority for the Project. Primary matters raised during these engagement sessions reflected matters raised by the community such as the need to include potential impacts to local water quality during construction, potential impacts on reservoir water quality from the excavated material placement, impacts on native and threatened species, and traffic impacts across the Project.

The proposed approach to community engagement, if the Project is approved, is to focus on providing engagement activities and communication materials that provide up to date Project information to those likely to be affected during construction and also allow the community to communicate concerns with the Project. A stakeholder engagement framework has been developed for the Project that provides a structure for the management of stakeholder relations and communication related to the Project. The proposed engagement approach is tailored to each stakeholder group, is flexible and will be reviewed regularly following engagement activities.

7.4 Biophysical, social and economic considerations

Potential impacts of the Project have been comprehensively assessed in Chapter 6 of the EIS and in the Amendment Report which includes supporting technical. This section provides a summary of the key predicted impacts from the Project.

7.4.1 Avoidance and minimisation

A key focus of Project design has been to avoid and minimise impacts identified during field surveys, preliminary assessment and throughout consultation. Implementation of the DIAA process to optimise the design resulted in some significant environmental improvements and outcomes. This includes the following:

- Siting of the proposed access roads, powerline routes and ancillary infrastructure primarily in areas of non-native- and highly modified vegetation, where possible. This includes use of cleared areas and existing access tracks where possible to avoid impacts to biodiversity and heritage, namely the emergency egress road from the upper dam and reservoir to a fire trail utilises existing tracks and utilising a portion of an existing transmission easement in the southern portion of the Project area.

- On site excavated material to be re-used on site an emplaced within the disturbance footprint to reduce traffic volumes on the external road network.

- Changes to the disturbance footprint to specifically avoid and minimise impacts to threatened flora and fauna species, namely:

    - The spoil emplacement at the upper reservoir and the emergency access road was reduced and modified to avoid direct impacts to all individuals and microhabitat recorded within the construction envelope for *Pultenaea rubescens*.

    - Relocation of the communications tower and site office at the upper reservoir to avoid impacts to four Cryptic Forest Twiner plants that were recorded in the construction envelope, avoiding direct impacts to all individuals recorded within the construction envelope.

    - Siting of transmission line towers were located to avoid approximately 98 *Grevillea guthrieana* plants along the transmission line. Clearance for the transmission line was also altered to avoid direct impacts to approximately 13 Scrub Turpentine plants, avoiding direct impacts to all individuals recorded within the construction envelope.

    - The disturbance footprint was moved outside of the floodplain area where Wandering Peppercress was recorded to occur or identified as having habitat that supports this species where possible. This design modification will result in the retention of over 1,500 plants with just two of the 1,577 plants recorded (0.12% of the population) impacted by the Project.

- Redesign of the access road proposed to connect the lower and upper reservoir, the objective was to avoid as much as possible impacts to cliff lines, rocky escapements, and features to support refuge areas for Brush-tailed Rock-wallabies. While this could not be completely avoided due to the large area of suitable habitat that separates the two reservoirs, impacts to this habitat (particularly refuge habitat) was reduced as much as possible to incorporate the road design.

- Modification to Project design to avoid and minimise impacts to heritage, namely:

  - Re-design of the access track and EAR to ensure avoidance of the curtilage of the axe production site (AHIMS #21-5-0142).

  - Discontinuation of the permanent bridge crossing of the Macleay River at Georges Junction proposed by the initial design location, following identification of cultural sites.

  - Minor changes to the disturbance footprint, notably along the access track and EAR, to avoid many of the identified sites, such as OMPS-FA7.

  - Removal of one of two initial options, including a design change to the preferred alignment, for the EAR joining the Kempsey Armidale Road following the identification of the Lower Creek/Long Flat Station (OMPS-CS5) in this general location.

- By amending the site access to go via the EAR, the Project removed the need for the Georges Junction permanent access (based on the original proposed location) and avoided impacts to recreational uses (Georges Junction campground and fishing) as well as potential heritage and biodiversity impacts (discussed above). The development of the EAR also enabled the Project to divert construction traffic from a problematic portion of Kempsey Armidale Road that would otherwise need significant road upgrades.

- The disturbance footprint for Main Access Road does not intersect the National Trail (a historic and recreational trail) and access to the trail will be maintained at all times.

Where impacts could not be fully avoided, they have been minimised where possible. Unavoidable impacts are further discussed in the following sections.

7.4.2 Local impacts

Construction of the Project would result in the direct disturbance of up to 367 ha of land to enable its construction. Indirect impacts outside of this disturbance footprint are also likely to occur due to mobilisation of soil and water, changes in amenity (noise), and influx and movement of workers and construction traffic.

The key direct and indirect potential impacts to the local area during construction are summarised in Table 7.1.

Table 7.1 Summary of Project impacts

Assessment matter	Summary of Project impacts
Terrestrial ecology	The Project will involve clearing and inundation of land and will therefore result in loss of native vegetation of varying condition in affected areas. The Project will result in the loss of 362.8 ha of native vegetation and threatened species habitat and loss of 9.7 ha of threatened ecological communities. Indirect impacts include edge effects, disturbance to native animals in adjacent habitat, interruption of animal movement, vehicle strike and impacts to water quality during construction. A Biodiversity Management Plan will be prepared to mitigate and manage direct and indirect impacts to biodiversity during construction and operation. OMPS will compensate for these residual impacts through the implementation of a biodiversity offset strategy. The extent of GDEs and water table drawdown have been assessed, and given the flow in the respective adjacent watercourse is likely to be sustained by rainfall runoff and releases from the upper reservoir during construction and operation, facultative/opportunistic GDEs are at low risk of potential impacts.
Aquatic ecology	Potential impacts to aquatic ecology include impacts to key fish habitat, riparian and aquatic habitat and fish passage, in particular as a result of minor short-term decreases in surface water volume and flow within sections of the Macleay River and associated tributaries as a due to reservoir construction and one off filling. Habitat for threatened species is generally limited within assessed waterways and significant impacts to threatened species (Southern Purple-spotted Gudgeon and the Manning River Helmeted Turtle) are concluded unlikely to occur. Significant indirect impacts to aquatic ecology are concluded to be unlikely with the implementation of mitigation measures. Aquatic ecosystems have been assessed as non-dependent on groundwater and are assessed as low risk for Project induced impacts. It is anticipated that impacts to stygofauna communities will be low as only a small area of stygofauna habitat is predicted to be affected by drawdown, and species of stygofauna have not been identified during site investigations to date.
Aboriginal heritage	Some 24 discrete identified sites, 19 areas of cultural deposits and a discontinuous and distribution of surface and shallowly buried stone artefacts (OMPS-BS1 [#21-5-0178] have the potential to be impacted. Of these, 12 sites and 18 areas of cultural deposits are entirely or partially within the construction envelope and potentially adversely affected. Some 13 of the sites, however, would be unaffected. An Aboriginal Cultural Heritage Management Plan will be prepared to guide the process for management and mitigation of impacts to Aboriginal objects, which includes additional investigations and salvage, if appropriate, further consultation with relevant parties, development and implementation of an interpretation strategy.
Historic heritage	The Project will result in some loss of significance of the existing cultural landscape, which consists of cleared fields, river crossings, fences and archaeological sites. While areas of high potential for archaeological relics have been avoided, there is potential for the Project to impact archaeological resources associated with Long Flat Station, as the full extent of buildings associated with the site is currently unknown, as well as sections of the travelling stock camp on Crown Reserve No. 1075. Overall, the historic heritage assessment determined the Project poses a low impact to the heritage significant of the Project area. An Historic Heritage Management Plan will guide mitigation and management, including identifying areas where further archaeological excavation may be required to inform these measures.
Water	Local effects on water resources will occur as a result of the Project, primarily related to water quality (erosion and water discharges during construction), and changes in streamflow when extracting water from the Macleay River for the initial one-off fill of the reservoirs and for construction and operation. However, extraction of water for the Project is not expected to impact the availability or security of water to downstream users. Any geomorphological impacts are expected to be restricted to Fingerboard Crossing Creek however potential impacts are limited by the creek's natural resistance to change. A negligible long-term impact on sediment transport processes is anticipated within the Macleay River. While groundwater drawdown has been predicted to extend locally, groundwater receptors (including the Carrai Waterholes and water supply bores) are not predicted to be impacted during construction or operation of the Project. The risk to GDEs is considered low noting that the drawdown predictions are worst case based on conservative hydraulic conductivity values in the model and un unmitigated tunnel construction methods.

Assessment matter	Summary of Project impacts
Land	Impacts to soils and land within the Project area is limited to the disturbance footprint with the implementation of erosion and sediment controls and other standard measures. Degradation or loss of soil and land resources will have a subsequent minor reduction on agricultural capability and productivity, with a permanent loss of some 280 ha needed for operational infrastructure. The agricultural viability of soils in the Project area was found to be limited. Potential land use conflicts have been considered and after mitigation those residual high-risk conflicts are all associated with Project-related construction risks (i.e. traffic-related safety and fire). They remain high risk due to the severity of consequence of these risks occurring, rather than the likelihood of them occurring. A rehabilitation strategy has been prepared and identifies the final land use domains proposed for end of Project life, with these domains commensurate with the surrounding native vegetation and land uses.
Transport	Transport impacts are associated with an increase of construction traffic on the local road network, which at the peak of construction, would be about 213 daily vehicle trips. The volume of traffic would ramp up and down either side of this peak. The Austroads design standards are met for the majority of the roads along the haulage route. Road sections that have not met Austroads design standards are predominantly near the Project area where it is recommended to implement traffic control measures or road widening treatments, identified with consideration of the Project Road Safety Audit findings and recommendations. Some external road upgrades are required to sections of Kempsey Armidale Road to accommodate construction traffic access and these requirements are being progressed separately through a HoA with local councils.
Amenity	The key amenity impacts of the Project relate to changes to the landscape and visual impacts associated with the introduction of new infrastructure into the landscape, as well as noise impacts. Landscape and visual impacts are considered to be negligible to low with exception of one LCZ (Upper slopes) and two viewpoints (Mary's View, Carrai NP; and Georges Junction Campground) which are conservatively predicted to experience moderate impacts. Mitigation was not incorporated into the assessment however is identified as an opportunity during detailed design if required. Some minor exceedances of construction noise levels under noise-enhancing weather conditions and sleep disturbance were predicted at two residential receptors, attributed to temporary construction traffic. Mitigation measures to reduce levels as close to NMLs as possible have been identified.
Air	During construction, emissions will be generated from fugitive and combustion sources. Predicted cumulative concentrations and deposition rates for incremental TSP, PM_{10}, $PM_{2.5}$ and dust deposition during the Project's construction phase are below the applicable impact assessment criteria at all assessment locations. Standard management measures will be adopted to manage air quality emissions. The estimated GHG emissions for the construction phase of the Project are an average of 48,441 t of carbon dioxide equivalents (CO_2-e) per year and an average of 14,621 t of CO_2-e per year during operations. The emission saving for the Project associated with avoiding peak gas-fired generation was determined and includes around 780 kt CO_2-e/y in 2030 to around 805 kt CO_2-e/y in 2035 and beyond.
National heritage	The Project area is located partly adjacent to a portion of the curtilage of the World Heritage List (WHL) and National Heritage List (NHL) GRA. It encompasses, amongst other areas, part of the OWRNP. No part of the Project area is in the GRA or a national park. Activities undertaken in accordance with the Project would be restricted to the construction envelope, and as such no direct impacts to the GRA would occur as a result of the Project. Potential indirect impacts have been considered and it is concluded that overall the Project will not have a significant impact on the GRA.
Hazards	Bushfire risk will be a significant hazard for the Project and will be managed by implementing bushfire protection measures in accordance with the requirements of *Planning for Bush Fire Protection* (RFS 2019). Flooding by the Macleay River presents a risk which cannot be fully avoided, however the positioning of the Project elements predominantly above the 0.01% AEP flood level minimises the risk of harmful impacts. The potential for impacts to personnel to arise as a result of direct exposure to electric and magnetic fields has been assessed and found to be negligible.

Assessment matter	Summary of Project impacts
Social	The communities of the local area will most likely experience some direct social impacts associated with the Project due to its remoteness and existing lack of resources and services. Such social impacts are generally confined to construction and include those related to community cohesion, amenity (i.e. dust, noise, and visual amenity), traffic, demands on social infrastructure and services, housing and accommodation, employment, business and industry opportunities, and community health and wellbeing. Some of these potential impacts are short-term and there are long-term benefits to the local community, as a result of increased visitation and recreation, increased employment and expenditure on local goods and services, improved access to telecommunications and improved road conditions (due to upgrades).
Economic	There will be minor negative agricultural and economic impacts during the construction phase, such as an increase in competition for labour and other resources resulting in wage and price rises and shortages of supply to other sectors. OMPS proposes to work in partnership with the Armidale Regional and Kempsey Shire councils and the local community so that, as far as possible, the benefits of the projected economic growth in the region are maximised and impacts minimised wherever possible.
Waste	Waste streams to be generated by the Project have been identified and quantified. The Project will use the general hierarchy of waste minimisation principles such as reduce, reuse and recycle to minimise the quantity of waste that must be disposed off-site. This is maximised through reuse of excavated material in dam construction and emplacement and rehabilitation of residual material on site, and the reuse and recycling of cleared vegetation where possible.
Cumulative impacts	The remoteness of the site and distance from other major projects limits the potential for many direct and indirect cumulative impacts. While there are no identified developments within about 25 km of the Project site, the key matters that may be materially affected by cumulative impacts are changes to traffic, social and economic conditions. This includes consideration of cumulative construction workforce, operational workforce demand, employment benefits, population changes during construction, housing and short-term accommodation pressure, and social infrastructure.

Once post-construction rehabilitation is complete, there will be a residual operational footprint of 280 ha. While this does result in a permanent loss of some of the site's natural value, the operation of the Project is more likely to result in net positive impacts associated with the Project's long-term social and economic benefits, and conservation outcomes achieved through implementation of the biodiversity offset strategy. During operation, traffic generation and noise and air quality emissions would be minimal. Ongoing impacts requiring monitoring relate to the operating regime of the Project and the extraction and discharge of water, and the interaction of this regime with the biodiversity and groundwater environments.

7.4.3 Broader region

Some of the Project's predicted impacts are expected to be experienced at a regional level rather than on a local or site by site basis. These include economic, social and transport impacts that would have a broad area of influence.

The Project will deliver substantial economic benefits to the local region, NSW and NEM states, with key drivers being the direct investment to establish the Project, wage expenditure, reduced ongoing electricity fuel costs, and reduced electricity costs. At 900 MW, it will provide a significant opportunity for NSW to meet its legislated obligation under the EII(A) of 2GW of long-duration storage by 2030. The average annual impacts of the Project on the regional economic during construction is estimated at up to $248 million in annual direct and indirect output, $44 million in annual direct and indirect household income and generate up to 647 direct and indirect jobs over the construction period. The greatest effect will be experienced by the NSW economy with $535 million annual direct and indirect output, $147 million in annual direct and indirect household income and generate up to 1,653 direct and indirect jobs. As previously stated, a market benefits study indicated that in 2030/31 a 900 MW Project would reduce demand-weighted wholesale electricity prices by $7–9/MWh in NSW and $4–5/MWh in the other mainland regions. This amounts to approximately a $1 billion reduction in total mainland customer retail bills, and represents a significant step in decoupling NEM wholesale power prices from volatile internationally

traded energy commodities. It would also result in $50–70 million savings in fuel costs across the NEM and a reduction in carbon intensity by 400,000 t $CO_{2(e)}$ in 2030/2031 based on the ISP Step-Change scenario (EY 2022), primarily due to offsetting peaking gas fired generation.

The key social impacts relate to economic benefits, but also some potential negative impacts associated with housing affordability and increased demand for access to community services and infrastructure. The construction phase will see an influx of over 600 workers to the region. Baseline analysis of Kempsey Shire and Armidale Regional LGAs revealed an existing lack of available rental housing as well as high levels of housing stress in the regional area, which would be exacerbated with increased demand placed on accommodation by the Project, prior to the on-site accommodation camp being completed. It is also expected that tourist accommodation will be utilised by the Project and while this continues to provide income for tourist accommodation providers, it limits the accommodation available for other recreational users, tourists, and visitors to the region. This demand and potential impact to housing and tourist accommodation however is greatly reduced through the establishment of temporary or fly camps before the main accommodation camp is completed and investigating further opportunities to accommodate the workforce onsite.

Construction activities are expected to have some minor impacts on users of the Kempsey Armidale Road. Due to the current conditions of the Kempsey Armidale Road, upgrades of the road will need to take place for the road to be suitable for Project construction access, particularly for heavy vehicles, which may temporarily cause traffic congestion and delays for the local and regional community. However, this upgrade will benefit the community by reducing travel times, improving access to services and employment.

Other social benefits to be realised during operation include improved access for emergencies, improved communications generally, and for emergency services, static water source for fire fighting purposes and ongoing local employment.

7.4.4 Long-term benefits

As discussed in previous sections, once operational, the Project will provide numerous benefits to the local community, the NEM and NSW energy consumers. The Project will provide broad-scale environmental benefits through its long-term provision of low emission electricity and by physically firming and financially supporting VRE generation coming online.

The Project will also provide numerous long-term benefits to the local region particularly Kempsey and Armidale which are likely to be the main service centres to the Project. The Project development has identified several opportunities to provide a legacy of environmental, social and economic benefits through the comprehensive environmental impact assessment process and extensive community consultation. Some of the key long-term benefits that will be provided by the Project to the local region include the creation of employment, training and development opportunities, improved infrastructure and access, contributions to scientific research and understanding, provision of biodiversity offsets and creating economic growth in the region.

The rehabilitation of the temporary construction areas will be undertaken to ensure relevant site values are maintained. In the long-term improved access infrastructure along the Project main transport route will provide permanent access infrastructure assets to the community. The additional scientific research that has been completed for the Project will constitute a positive contribution to knowledge about the environmental values of the local area, particularly given its proximity to national parks, conservation areas and nature reserves. This includes significant ecological findings (e.g. identification of *Pultenaea rubescens,* larger population of the endangered Brush-tailed Rock Wallaby and mapping of a large number of Wandering Peppercress), additional investigations into the geology and hydrogeology of the local area, and increased evidence of Aboriginal and historical occupation of the local area.

While the Project would result in some intergenerational/cumulative loss to cultural materials, it is considered that there would be numerous cultural heritage benefits. These include the long-term preservation of substantive cultural material that would be either inaccessible and/or managed from future harm, a greater understanding of the past and contemporary values in the region, and opportunities for heritage interpretation and both Aboriginal and public outreach.

The Project will provide economic opportunities for the local region. It will provide opportunities for sub-contracting jobs and training associated with the Project construction and would provide economic growth to the local region. Community consultation has shown that the community is highly supportive and expects that the Project will provide lasting benefits for the region. There is also community recognition of the economic benefit that the Project has generated with work undertaken as part of the EIS.

The proponent will provide biodiversity offsets for the Project impacts to native vegetation, ecological communities and threatened species. The offsets will ensure biodiversity values of the local area are maintained by protecting, in perpetuity, a much larger area and number of species than what will be impacted.

7.4.5 Ecologically sustainable development

The principles of ESD are set out in Schedule 2 of the EP&A Regulation and in clause 3A of the EPBC Act. The Project has taken into account these ESD principles as summarised in Table 7.2.

Table 7.2 Evaluation of the Project against ESD principles

Principle	Evaluation of Project impacts against principle
Precautionary principle/ decision-making processes	A level of scientific certainty has been achieved through detailed research and field studies to establish a good understanding of the existing environment and incorporating avoidance measures. To allow for limitations in the assessments and adopting a precautionary approach, the EIS has been prepared with technical methodologies supporting a conservative approach to impact assessment. This includes assessing worst-case impacts and scenarios, such as noise-enhancing weather conditions in noise modelling, assessing threatened species for SAII impacts, and assuming presence of species where they could not reliably be discounted through survey (such as due to safety reasons) and incorporating this into the offset calculations for the Project. The Project has been designed to avoid environmental impacts where practicable, and mitigation measures are proposed to mitigate and manage the impacts where unavoidable. Any Project-related decisions would be guided by careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment and assessment of the risk-weighted consequences of various options.
Inter-generational equity	Future generations would benefit from the improved reliability of the NEM and a successful transition to a low carbon future. The Project responds to the challenges facing the NEM and the future consumer to provide a large scale, reliable, renewable energy supply. The Project and associated improvements to external infrastructure, such as roads and telecommunications, will provide local and regional community benefits. The EIS has identified the potential environmental impacts that may occur and appropriate protection, mitigation and/or management has been identified to ensure the health, diversity and productivity of the environment would be maintained into the future.
Conservation of biological diversity and ecological integrity	Detailed biodiversity assessments have been completed for the EIS and have informed iterations of the design and disturbance footprint to avoid and minimise impacts. The final land use domains identified as part of the Rehabilitation Strategy also supports a return of the land to native ecosystem at the end of the Project's life. The BDAR and Aquatic Impact Assessment were prepared in accordance with relevant legislation and have assessed the significance of effect on any threatened species, endangered communities, or their habitat. Any significant residual impacts on biodiversity would be offset to ensure the long-term conservation and integrity of like-for-like ecosystems.

Principle	Evaluation of Project impacts against principle
Improved valuation, pricing and incentive mechanisms	An Environment Protection Licence will be obtained for the Project for scheduled ancillary activities during construction and operation. The long-term Project benefits are considered to outweigh the Project impacts, with economic advantages expected during construction of the Project as well as during operation from increased energy reliability and supply to the NEM, and reduced consumer bills. The Project has been designed to avoid and minimise adverse environmental impacts where possible through a DIAA process. Any Project-related decisions have and will continue to consider environmental factors in a cost-effective way and be guided by the whole of life costs of providing goods and services.

7.5 Submissions and community views on the project

The EIS was publicly exhibited from the 19 September 2023 to 20 October 2023. Following the public exhibition period, 90 submissions were received by DPHI. Of these, 62 submissions were from the community (consisting of unique submissions), 11 from organisations, and 17 from government agencies.

Of the community submissions received, 17 submissions (i.e. 27%) were in support, 41 submissions were in objection and 4 submissions provided comments. In addition, of the submissions from organisations, two supported the project, seven objected to the project and two provided comments.

Themes raised in these submissions related to:

- Level of engagement and consultation with the indigenous communities.
- Potential impact on Aboriginal artefacts.
- Potential impacts on aquatic ecosystems and downstream water users.
- Water licensing and conditions of pumping within the Macleay Gorge water source area.
- Potential cumulative impact of vegetation loss.
- Justification of the project, particularly with regard to consideration of alternative sites and other long term storage methods (such as batteries).
- The Project's design and operation, including key concerns such as:
    - Access to site and road upgrades, specifically to the Kempsey Armidale Road. Many individuals raised comments for heavy vehicle traffic, safety concerns and Council rate increases as key concerns.
    - Flow and pumping rules for water take from the Macleay River, in particular with consideration of drought conditions.
    - Insufficient level of geotechnical information to inform design of a project of this scale.
- Impacts of the Project, including (but not limited to) impacts to environmentally sensitive areas, biodiversity, Aboriginal cultural heritage, landscape values and disturbance of contaminated land.
- Technical approach and modelling presented in the EIS, such as surface water modelling and climate change considerations, adequacy of the Aboriginal Cultural Heritage Assessment field investigations, and deferred management of impacts.
- Insufficient and/or inadequate level of engagement carried out by the Proponent with the community.

7.6 Approvals, environmental management and performance

The EIS was prepared to meet the requirements of the form and content specified in the EP&A Regulation, the SEARs, and guided by the *State significant infrastructure guidelines – preparing an environmental impact statement* (DPHI 2024). Supporting technical studies have been completed in accordance with the applicable technical requirements and guidelines and informed by consultation with relevant government agencies and other stakeholders.

The technical studies completed have been prepared on the basis of a construction footprint and preliminary design, noting that further advancement to a detailed design will occur. Where key uncertainties have been identified by technical studies or within this EIS, measures and actions have been recommended to provide further certainty prior to any construction impacts occurring. This includes completion of further Aboriginal heritage test excavations to satisfy any gaps in knowledge of the existing environment that may be impacted.

It is also noted that the Project relies on upgrades to external linear infrastructure for it to be constructed and operated as proposed. This includes:

- external road works to be implemented on sections of the Kempsey Armidale Road
- upgrade to Line 965.

These works will be subject to separate approval processes under the EP&A Act. These approval processes, and undertaking of the upgrades, would be undertaken by third parties.

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 an approval under the EPBC Act from the Commonwealth Minister for the Environment.

Should the approvals be granted for the Project, a number of secondary approvals or licences would be required to be obtained. In the most part, these approvals would be required to be granted in accordance with the conditions of the approvals granted under the EP&A and EPBC Acts. This includes the preparation and approval of a suite of environmental management plans to guide the responsible construction and operation of the Project.

The mitigation measures proposed for the Project are consolidated in Appendix C. It is anticipated that these measures would be consolidated to operate within an environmental management framework for the Project, and include:

- Construction Environment Management Plan (CEMP) and associated sub plans to manage impacts of the Project throughout the construction phase.
- Operation Environment Management Plans (OEMPs) and associated sub plans to manage impacts during operation and maintenance, including emergency management and response plans.
- Monitoring programs, including surface and groundwater, terrestrial and aquatic ecology, throughout the life of the Project.

7.7 Evaluation and conclusion

The Project will provide an additional 900 MW of dispatchable generating capacity, will be capable of delivering approximately 2,500 GWh annually[7] of long duration energy storage available to the NEM, and capable of meeting the needs of approximately 600,000 to 900,000 NSW households.

[7] Based on one pump-generation cycle per day, less an allowance for maintenance.

It will provide more flexibility for the NEM to respond to daily and seasonal variability when compared to other VRE and batteries. Most importantly, the Project will make a significant contribution to the continued decarbonisation of the economy.

Stakeholder engagement indicates that the Project has strong support from the community. Consultation to date identifies the public's expectation that the Project will contribute to reliability in the electricity network, lower energy prices, increasing and expanding sources of reliable renewable energy and minimising reliance on fossil fuels, minimising environmental impacts, increased drought-proofing and providing economic benefits to local communities.

The development of the Project is consistent with, and strongly aligns with Commonwealth and NSW strategic planning and policy objectives, including the *Paris Agreement*, LRET and the 2024 ISP, the Electricity Strategy, the Electricity Roadmap, the *Electricity Infrastructure Investment Act 2020*, the *NSW Energy Security Target*, the *NSW Climate Change Policy Framework*, the *Net Zero Plan Stage 1 2020–2030*, and the *Pumped Hydro Roadmap*. The Project will directly support objectives of the NSW *Electricity Infrastructure Investment Act 2020*.

The Project was declared CSSI by the NSW Minister for Planning under the NSW EP&A Act in September 2020. Projects can only be declared to be CSSI if they are of a category that, in the opinion of the Minister, is essential for the State for economic, environmental or social reasons. The declaration signifies the critical role that the Project will play in providing reliable energy and largescale long-duration storage to NSW as it transitions to a low emissions economy.

The Project has been designed to avoid and minimise impacts where possible in accordance with the principles of ESD. These principles were implemented through an iterative design approach (known as DIAA), supported by consultation with relevant technical advisors and government agencies. 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.

Most impacts from construction are localised and temporary and will generally be experienced for the duration of the approximately five-year construction period. These impacts will be managed through the implementation of appropriate environmental controls which will be documented in management plans and publicly reported against for consent and licensing purposes. However, some impacts will be permanent with the introduction of infrastructure into the site to operate the pumped hydro system and to transmit the power to the transmission network. These permanent impacts will predominantly be changes to the existing natural landscape and its setting, affecting biodiversity and Aboriginal heritage of the disturbed area. Biodiversity impacts will be offset to provide for long-term improvements and conservation outcomes for the local area.

The Project will deliver substantial economic benefits to the local region, NSW and NEM states, with key drivers being the direct investment to establish the Project, wage expenditure, reduced ongoing electricity fuel costs, and reduced electricity costs to consumers. A significant short-term effect will be experienced by the NSW economy during construction with economic modelling predicted $535 million annual direct and indirect output. The local economies of the Armidale Regional and Kempsey Shire LGAs will also benefit from the Project, with $44 million in annual direct and indirect household income. The proponent will continue to consult and engage with the stakeholders as the Project progresses through the assessment phase, and if approved, through the construction phase. The proponent will continue to engage with government agencies and to refine mitigation measures where required. The proposed approach to community engagement is to focus on providing engagement activities and communication materials that provide up to date Project information to those likely to be affected during construction and also allows the community to communicate with the Project should concerns arise.

There is a critical need to develop large-scale, renewable energy Projects to respond to the accelerated energy transition of the NEM. A do-nothing option would mean to forego the benefits of the Project and not satisfy this critical need. Through the implementation of proposed mitigation, management and offsetting measures, this EIS demonstrates that the Project could be undertaken without any significant long-term impacts on the local environment. As such, the Project is considered to be in the public interest.

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