

Oven Mountain Pumped Hydro Energy Storage

September 2023



Environmental Impact Statement Summary of Findings

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ACKNOWLEDGEMENT OF COUNTRY

OMPS Pty Ltd acknowledges the traditional owners and custodians of country throughout Australia and acknowledge their continuing connection to land, waters, and community. We pay our respects to the people, the cultures, and the elders past, present and emerging.



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Kempsey, a major centre in the North Coast Region

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FOREWORD

OMPS is pleased to submit our Environmental Impact Statement (EIS) in support of our proposal to construct the Oven Mountain Pumped Hydro Energy Storage Project.

The Oven Mountain Project will provide significant opportunities to capture much needed regional investment, job creation, and community benefits in the Mid-North Coast and New England regions. The Project will also result in many market and environmental benefits, including an annual reduction of approximately 400,000 tonnes CO₂-e in generation emissions.

Pumped hydro is a mature and proven technology used widely across the world. The Oven Mountain Project will play a critical role in delivering much needed long duration storage capacity, as well as dispatchable energy, to meet changing needs across New South Wales and Australia.

The Project will also help secure a more sustainable future by directly supporting the development of up to 1,600 megawatts of additional renewable energy projects in the New England Renewable Energy Zone (REZ).

Since 2017, OMPS has worked hard to ensure that the Project is developed with understanding and respect for the history, needs, expectations, and future vitality of the region. The team recognises the importance of fostering genuine, meaningful, and long-term relationships with local and regional people, business, and communities.

We would like to thank the many stakeholders and community members that have offered their time, effort, and personal insights. Your contributions have been used to inform our design process and will help ensure that we deliver the best outcome for the region.

Sincerely,

The OMPS Team



Armidale, a major centre in the New England Region

SUMMARY OF FINDINGS

The Oven Mountain Project

The Oven Mountain Pumped Hydro Energy Storage Project is an 'off river' development located adjacent to the Macleay River between Armidale and Kempsey.

The Project includes the development of an upper and lower reservoir, an underground power station complex, access and waterway tunnels, a new transmission line linking the generation site to the existing Armidale-Kempsey Line 965, a new site access road, and upgrades to existing local and regional roads.

Situated within the New England Renewable Energy Zone (REZ), the Oven Mountain Project will provide clean energy generation and storage capabilities, ensuring a reliable, resilient, and renewable future energy supply for NSW.

The main Project components, the reservoirs and underground power station, are located on privately owned land. No national park or state forest land is crossed by the Project footprint or construction works. Access rights are negotiated and contracted before the Project can proceed.

Purpose of this Document

An Environmental Impact Statement (EIS) has been prepared for the Oven Mountain Project. The EIS provides information on the economic, environmental, and social impacts of the Project. It helps the community, government agencies and the approval authority to make informed submissions or decisions on the Project.

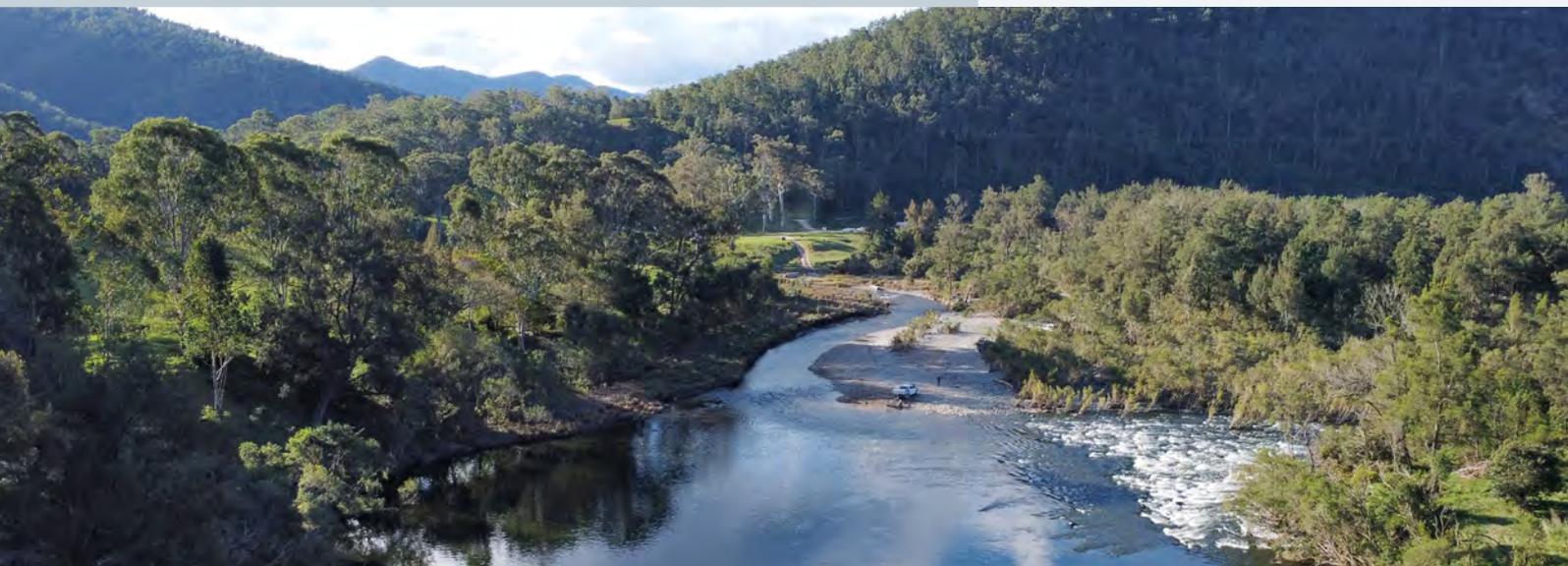
The EIS is a robust and comprehensive document that incorporates a diverse range of analysis and input from independent technical and scientific experts. The EIS demonstrates a holistic and rigorous approach to a broad range of social, economic, and environmental matters.

This Summary of Findings document provides a high-level overview of key parts of the EIS. It presents a summary and description of the Project, then outlines the planning and assessment processes, stakeholder engagement activities, and key potential impacts and approaches to management and mitigation. Importantly, each section shows you where in the EIS you can find more information. This document is intended to be read alongside Chapter 6 and Appendix E of the EIS, which details the Project's approach to mitigation and management:

- **Chapter 6: Assessment and Mitigation of Impacts**

This chapter provides summaries of the key impacts, outcomes, and mitigation measures proposed by the Project. Investigations have culminated in the development of technical specialist reports, which

The Project is an 'off river' development and will not dam the Macleay River.



are included as appendices to the EIS. Mitigation measures have been identified to avoid, minimise, and manage predicted impacts where feasible.

- **Appendix E: Proposed Mitigation Measures**

This section provides a consolidated list of all the mitigation measures contained in the EIS. It is anticipated that these mitigation measures will serve to inform the development of an environmental management framework that is implemented prior to the commencement of construction (e.g., Construction Management Plan, Operation Environment Management Plans, and various monitoring programs).

Importantly, this Summary of Findings document also explains how you can make a submission to the Department of Planning and Environment (DPE) about the EIS.

Statutory Context

In October 2020, the Oven Mountain Project was declared Critical State Significant Infrastructure (CSSI). This means the NSW Government – under Section 5.13 of the *Environmental Planning and Assessment Act 1979* – deemed it as a high-priority infrastructure project, considered essential for economic, environmental, or social reasons.

A CSSI declaration does not change the approval pathway a project must follow. All CSSI projects must develop a rigorous EIS that addresses the requirements stipulated in the Department of Planning and Environment’s (DPE) Secretary’s environmental assessment requirements (SEARs), and seek formal approval from the NSW Minister for Planning.

Major projects which could have an impact on matters of national environmental significance may also require a referral to the Australian Government’s Department of Climate Change, Energy, the Environment and Water (DCCEEW), in addition to the above NSW Ministerial approval, under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*.

The Oven Mountain Project was referred to both DPE and DCCEEW and was designated a CSSI project under the EP&A Act and a controlled action under the EPBC Act.

Want to know more?

See EIS chapters:

- Executive Summary
- Chapter 4: Statutory Context
- Chapter 7: Evaluation
- Appendix A: SEARS Compliance
- Appendix C: Statutory Compliance

Planning and Assessment Process

OMPS Pty Ltd (OMPS) is seeking approval to construct and operate the Oven Mountain Pumped Hydro Energy Storage Project under the EP&A Act and the EPBC Act.

The EIS was submitted to DPE as required under the CSSI assessment process. It outlines the Project’s key features, assesses its potential environmental, economic, and social impacts during construction and operation, and offers proposed mitigation measures.



To learn more about the Project, interested community members can visit our website at www.ompshydro.com contact us on 1800 518 194 or drop into our **Community Information Hub** in Kempsey at 2/28 Clyde Street.

Community Information Hub





HOW TO HAVE YOUR SAY

The formal public exhibition of the EIS is conducted by DPE (not OMPS) and is an important part of the environmental and planning approval process. The exhibition period allows the public to learn more about the Project, review and assess technical studies, and provide informed feedback to DPE for their consideration.

The Oven Mountain Pumped Hydro Energy Storage Project Environmental Impact Statement will be publicly exhibited from **19th September to 16th October 2023**.

The Department of Planning and Environment welcomes all submissions received during the public exhibition period. The Department will subsequently consider all submissions as part of the formal assessment process.

Importantly, the Department will also request that OMPS provide an appropriate response to each submission received. These responses will be included in a Response to Submissions Report, which will be made publicly available.



ONLINE

To make a submission online, please follow the steps below:

1. View the EIS and other project documents at www.planningportal.nsw.gov.au/major-projects/projects/oven-mountain-pumped-hydro-energy-storage
2. Log in or create a user account.
3. Find the **Oven Mountain Project Pumped Hydro Energy Environmental Impact Statement 2023** and check the submission box.
4. Before making your submission, please read DPE's privacy statement. DPE will publish your submission on its website in accordance with the privacy statement.
5. Your submission can either be typed or uploaded as a PDF and must include:
 - the application name and number.
 - a statement on whether you support or object to the proposal.
 - the reasons why you support or object to the proposal.
 - a declaration of any reportable political donations made in the last two years.
6. Agree to the online statement and lodge your submission.



BY POST

You may also lodge your submission via post and the envelope **MUST** be addressed to the:

**Director – Energy Assessments, Development Assessment,
Department of Planning and Environment,
Locked Bag 5022, Parramatta NSW 2124**

Written submissions must include:

- your name and address, at the top of the letter only.
- the name of the application and the application number.
- a statement on whether you support or object to the proposal.
- the reasons why you support or object to the proposal.
- a declaration of any reportable political donations made in the previous two years.

All submissions must reach DPE before the close of the exhibition period. All submissions will be made public in line with DPE's objective to promote an open and transparent planning system. If you do not want your name published, please state this clearly at the top of your submission.

DPE can be contacted about the Project by calling Anthony Ko on **02 8217 2022**.

WHAT HAPPENS AFTER THE SUBMISSION PERIOD?

Following the submission period, DPE will provide OMPS with all the submissions received and subsequently publish them online. OMPS will then respond to the submissions through a report to DPE, which will also be made publicly available.

DPE will then assess the Project and make a recommendation to approve or reject, along with conditions of consent or reasons for refusal. The recommendation is referred to the NSW Minister for Planning and Public Spaces, or a delegate, for determination.

Under the joint agreement between the NSW and Australian governments for matters governed by state and federal environmental law, DPE's Environmental Assessment Report and the Minister's decision are forwarded to DCCEEW with a recommendation on whether the controlled action should be approved, with or without conditions under the Federal EPBC Act.



OMPS team members will be on hand to answer your questions about the Project.

EIS STRUCTURE

The EIS brings together several years of site and field investigations, ongoing design work, and community engagement activities. It consists of two parts designed to make information accessible and easier to navigate and understand.

The first part is the main EIS report (Chapters 1-7), which provides a plain-English summary of the key findings of the specialist assessments for the community and stakeholders. The second part is the appendices section, which provides all the in-depth technical reports and findings as well as mitigation measures for associated impacts.

OMPS recognises that the cost of telecommunication and connectivity can provide challenges across regional communities. To this end, the team will make available full copies of the EIS on USB drives through the Kempsey Information Hub and will support the public exhibition process with 'drop-in' community information sessions across the region. We are also available to respond to questions during normal business hours by emailing us on info@ompshydro.com or calling **1800 518 194**.

To find out more, visit www.ompshydro.com

OMPS help is available

If you are unable to access the EIS or supporting documents online, or have any questions, please contact OMPS toll-free on **1800 518 194** or via info@ompshydro.com.



1800 toll free information line



Community information sessions



Summary Of Findings Booklet



Website, email and social media

STRATEGIC CONTEXT

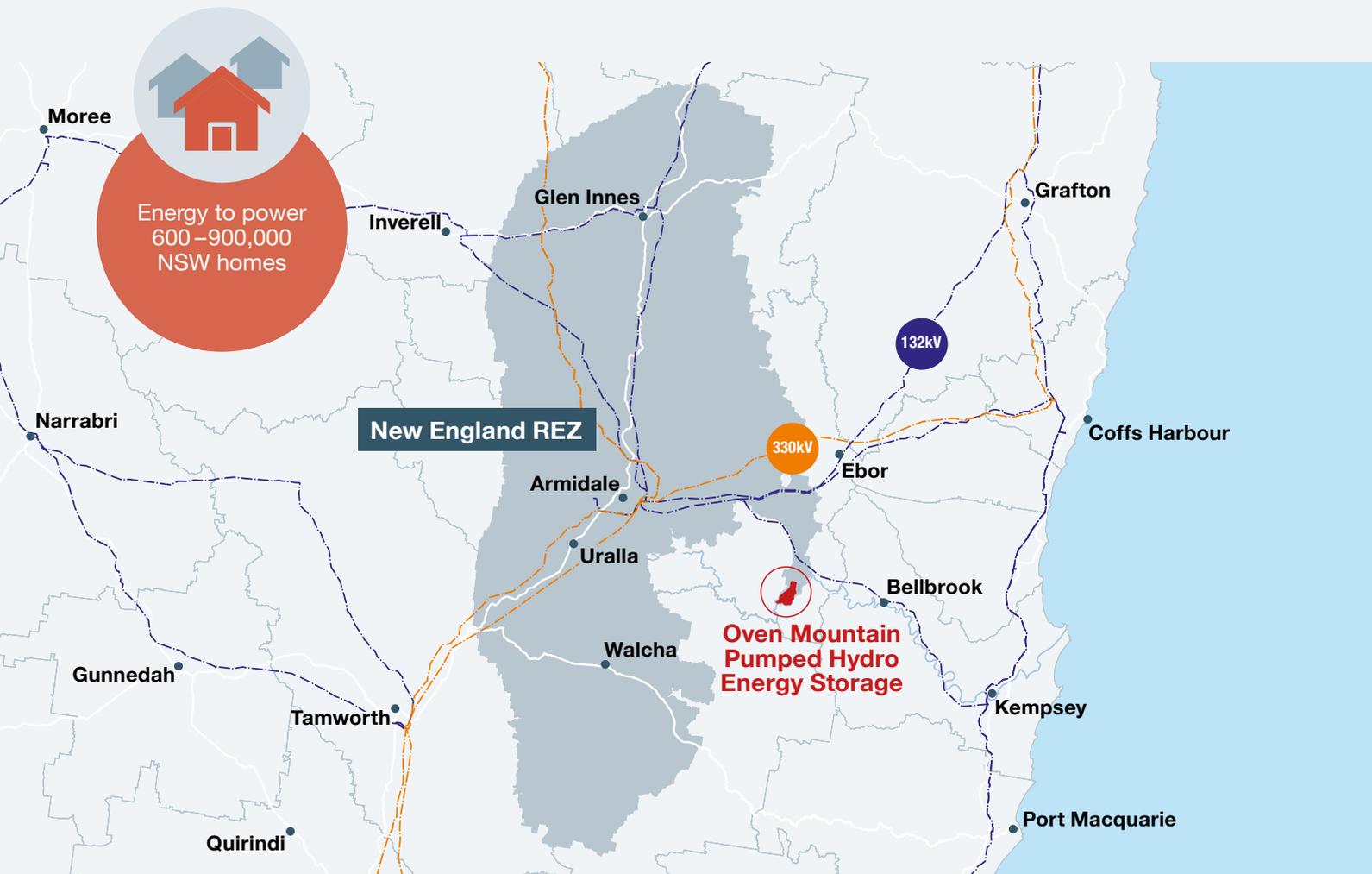
The National Electricity Market (NEM) connects over 65 gigawatts of generation to nearly 11 million customers in SA, TAS, VIC, NSW, ACT and QLD over a transmission network spanning around 40,000km.

The NEM is currently undergoing a significant transformation in the way electricity is generated, transported, and consumed, with an evolution towards greater reliance on renewable and clean energy technologies, as ageing coal-fired generating capacity is retired.

The changing energy landscape – termed a ‘once-in-a-generation’ transformation – is filled with challenges and opportunities that remain complex and necessary. The *NSW Electricity Infrastructure Roadmap* and the *AEMO’s 2022 Integrated System Plan* emphasise the ongoing importance of coordinated efforts, forward-thinking planning and reform, and continued investment in transmission augmentation, variable renewable energy capacity, and energy storage capabilities.

The *2022 Integrated System Plan* notes that by 2050 there will be a need for “over 60 GW of firming capacity to be in place to respond to a dispatch signal. While the system today has approximately 43 GW of firming capacity, 23 GW of this is coal-fired generation. As this coal-fired generation retires, it needs to be replaced with new low-emission firming alternatives. New utility-scale battery and pumped hydro storage, located at appropriate parts of the network, will enable more effective dispatch of clean electricity on demand, increase resilience by shifting energy through time to manage weather variations, and provide critical system security services” (AEMO, 2022, p.51).

The Oven Mountain Project will form an important part of Australia’s response to climate change and the Australian Government’s commitments to the reduction of carbon emissions in the electricity industry. The Project will ease pressure on electricity prices and will contribute to the growth of both renewable energy and utility scale storage capacity. Pumped hydro energy storage currently comprises over 90% of the world’s large-scale energy storage capacity.



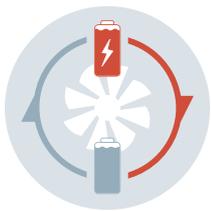
“ Technical innovation, ageing generation plants, economics, government policies, energy security and consumer choice are all driving this transformation and driving it faster than many anticipated. Some of them form part of the global push for net zero emissions by 2050, while others are independent. All the while, the NEM must continue to meet its objective – to provide reliable, secure, and affordable electricity to consumers. ”

2022 Integrated System Plan (AEMO, 2022, p.7).

PROJECT BENEFITS

The Oven Mountain Project will provide much needed long-duration storage and offer greater reliability to the National Electricity Market (NEM). The Project will produce up to 900 MW of electricity and will store enough water for up to between 8 and 12 hours of dispatchable, reliable energy at full generation.

THE KEY BENEFITS OF THE PROJECT ARE:



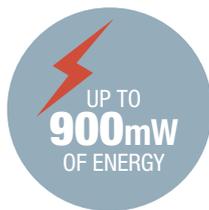
Decarbonising the Economy with renewable energy



100-year design life



Closed loop 'off river' system – no reliance on river level variations



Large-scale, low cost energy storage providing seasonal change security



Up to 12 hours of continuous energy



Essential grid services to support system stability and security in the NEM



Land & biodiversity management opportunities



Industry information sessions are held at every opportunity.

Want to know more?

See EIS chapters:

- Chapter 2: Strategic Context
- Chapter 7: Evaluation
- Appendix F: Strategic Context

Social and economic benefits for local / regional communities



+600 Jobs expected during 4-5 year construction phase

\$112m Annual investment boost to the local economy during operation

4-5yrs A construction phase that fosters regional skills, education, and training opportunities

+90 Permanent direct and indirect operational phase jobs

SITE SELECTION

OMPS has extensively investigated the pumped hydro energy storage potential of the Project area considering key development attributes including natural terrain, capacity, grid connection, community, as well as planning and environmental constraints.

The Project site possesses excellent characteristics for an off-river pumped hydro energy storage development, namely a significant 'head' height and geological formations which are ideally shaped and located to work as reservoirs.

A high vertical head and a short horizontal distance between reservoirs is highly desirable, as this combination allows for a much more efficient scheme to

be designed. In this regard, the Oven Mountain Project is one of the most suitable sites identified in Australia. Furthermore, the Project reservoirs are "off-river" and will access the Macleay River for an initial fill during high flow conditions only.

Want to know more?

See EIS chapters:

- Chapter 2: Strategic Context
- Appendix F: Strategic Context



PROJECT DESCRIPTION

The Oven Mountain Project is an ‘off river’ pumped hydro energy storage project located on private land, between Armidale and Kempsey in the New England Renewable Energy Zone.

The Project

OMPS Pty Ltd (OMPS) is seeking approval to construct and operate the Oven Mountain Pumped Hydro Energy Storage Project.

The Project involves the construction and operation of a pumped hydro energy storage system, which includes two ‘off river’ water containment structures to create an upper and a lower reservoir.

Project Location

Much of the Project area contains undulating and steep terrain ranging in elevation from approximately 150m to 1,000m above sea level with vegetation ranging from heavy to cleared.

The Project is located in the Armidale Regional Council LGA and is situated on the western slope of the Carrai Plateau within the New England tablelands. It is adjacent to the Macleay River and Carrai State Conservation Area lies to the east.

Cunnawarra National Park, Oxley Wild Rivers National Park, and the Carrai National Park are also proximate to the Project area. A section of the National Trail passes through the western side of the Project area but is outside the Project construction footprint.

The Project is expected to disturb approx 330 hectares of land (“disturbance footprint”) based on current design. The EIS studies this within a larger, buffered “construction envelope”. Once rehabilitated the, the Project’s operational footprint is expected to be approximately 270 hectares.

Key Features

The Project consists of the following key features:

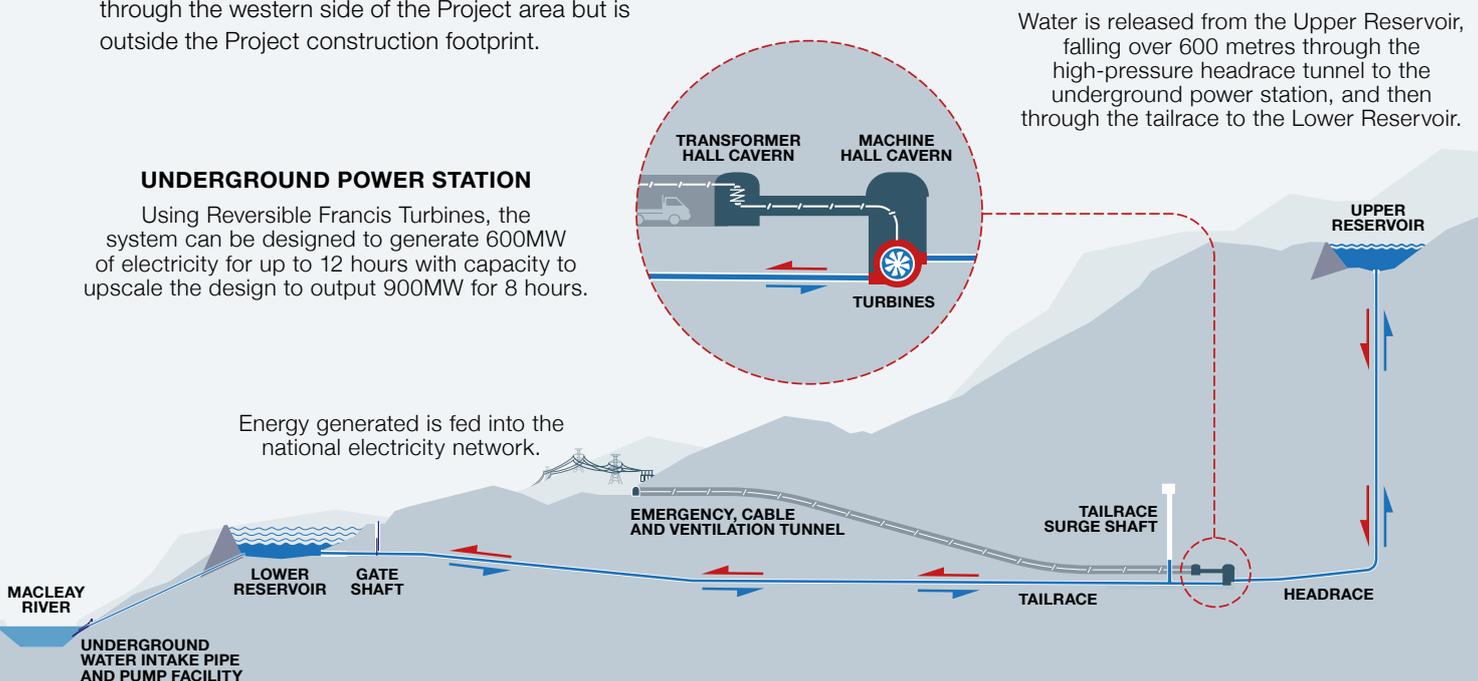
GENERATION INFRASTRUCTURE

- Underground power station complex (consisting of two main caverns and several interconnecting tunnels).
- Dams and reservoirs (two concrete faced rockfill dams and reservoirs).
- Water intake structures (two intake structures, one at each reservoir).
- Spillway (two concrete lined spillway chutes, one for each dam and reservoir).
- Macleay River pump facility (for first and ongoing reservoir fills including fish protection screening).
- Tunnels (three main tunnels comprising of two main access tunnels and the emergency, cable and ventilation tunnel).
- Power waterway (including a vertical pressure shaft, head race and tail race tunnels).

UNDERGROUND POWER STATION

Using Reversible Francis Turbines, the system can be designed to generate 600MW of electricity for up to 12 hours with capacity to upscale the design to output 900MW for 8 hours.

Energy generated is fed into the national electricity network.



PROJECT OVERVIEW

-  Eastern access road
-  Northern transmission access road
-  Generation component access road
-  Pumped hydro generation component
-  Disturbance footprint
-  Construction envelope
-  Proposed HV transmission line route
-  Proposed HV transmission tower location
-  Internal transmission
-  Proposed storage reservoir
-  Dam wall
-  Indicative underground waterway
-  Indicative underground access tunnel
-  Indicative surface works

EXISTING ENVIRONMENT

-  Existing 132kV transmission line
-  Main unsealed road
-  Local unsealed road
-  4WD vehicle track
-  National Trail
-  Watercourse
-  National park, reserve and state forest

TO ARMIDALE

CUNNAWARRA NATIONAL PARK

GEORGES CREEK NATURE RESERVE

A new electricity transmission network will be constructed from the generation site to the existing Armidale-Kempsey 132kV line 965 owned by TransGrid.

George's Junction

The Oven Mountain project is a closed loop pumped hydro initiative. Water is circulated between the upper and lower reservoirs via waterways and turbines, which generate electricity. This electricity is then fed into the network.

Accommodation camp

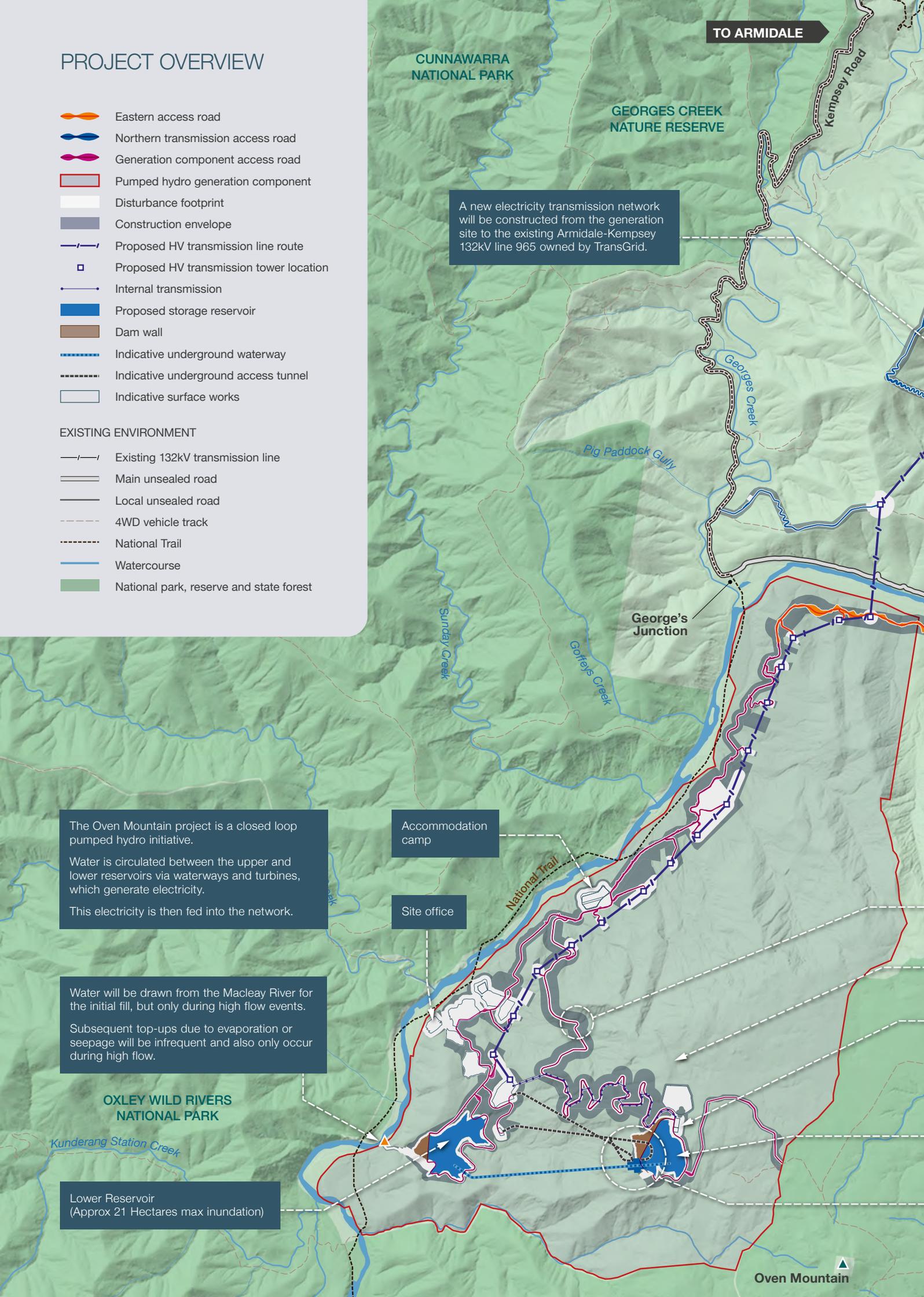
Site office

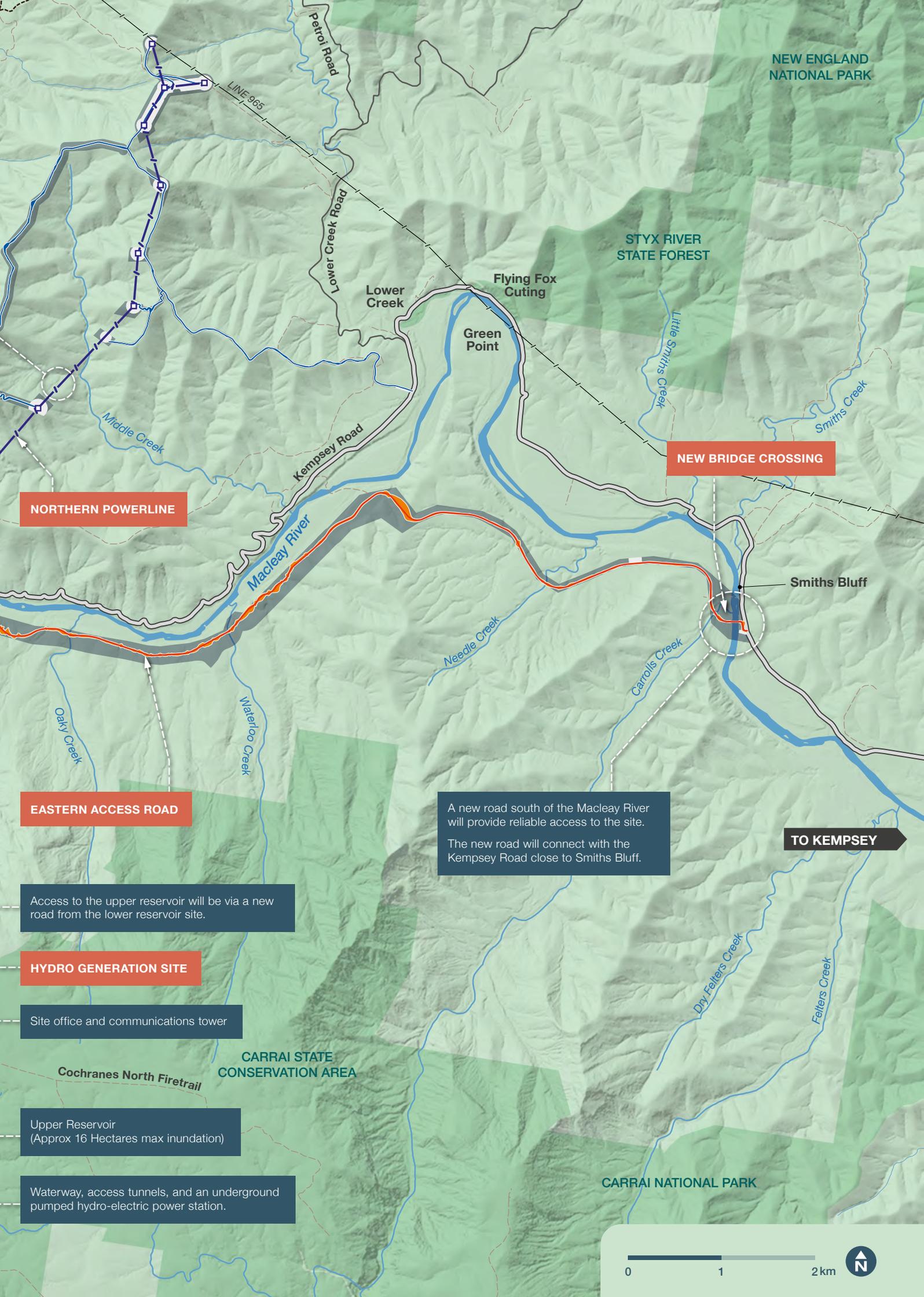
Water will be drawn from the Macleay River for the initial fill, but only during high flow events. Subsequent top-ups due to evaporation or seepage will be infrequent and also only occur during high flow.

OXLEY WILD RIVERS NATIONAL PARK

Lower Reservoir (Approx 21 Hectares max inundation)

Oven Mountain





NORTHERN POWERLINE

EASTERN ACCESS ROAD

Access to the upper reservoir will be via a new road from the lower reservoir site.

HYDRO GENERATION SITE

Site office and communications tower

Upper Reservoir
(Approx 16 Hectares max inundation)

Waterway, access tunnels, and an underground pumped hydro-electric power station.

A new road south of the Macleay River will provide reliable access to the site. The new road will connect with the Kempsey Road close to Smiths Bluff.

NEW BRIDGE CROSSING

TO KEMPSEY

CARRAI NATIONAL PARK

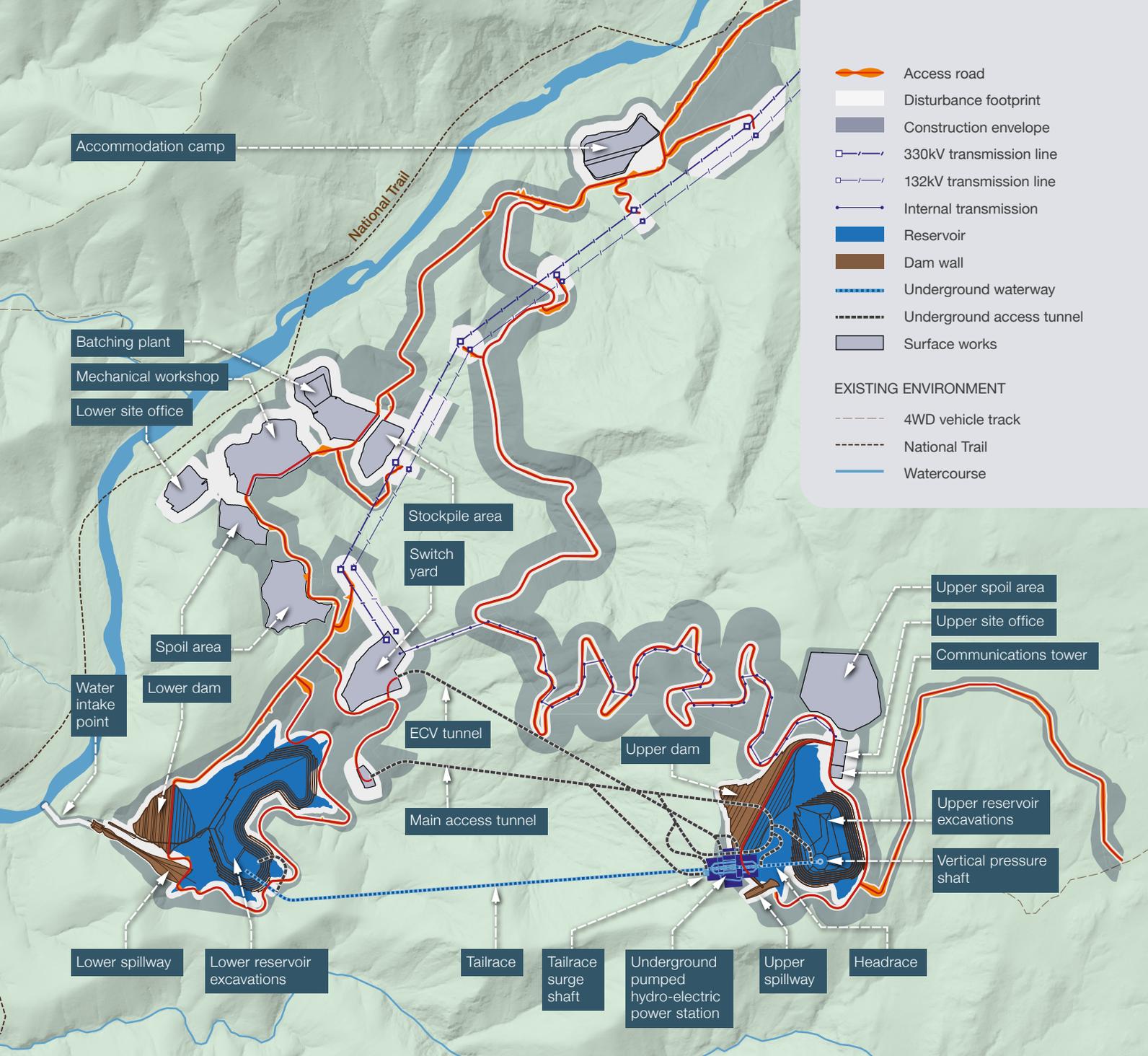
CARRAI STATE CONSERVATION AREA

STYX RIVER STATE FOREST

NEW ENGLAND NATIONAL PARK

0 1 2km





**ANCILLARY INFRASTRUCTURE
(CONSTRUCTION AND OPERATION)**

- Access roads, access tracks and bridges.
- Approximately 40km of permanent roads with 25km being newly constructed roads.
- Temporary construction surface works pads and facilities:
 - Accommodation camp and other temporary camps.
 - Concrete batching plants, mechanical and electrical workshops, laboratory, and various water treatment areas.
 - Soil emplacement areas.
 - Staging areas.
 - Laydown / stockpiling areas.
 - Temporary site offices.
- Communications (such as fibre optics cable and communications tower).
- Utilities during construction (water and electricity).
- Utilities for operation (water and electricity).
- Water diversion and water treatment facilities (consisting of cross drainage culverts, drainage pits and pipe, open channels/drains, levees, and sedimentation controls).
- Spoil Emplacement areas (three permanent spoil emplacement locations with the ability to store approximately 2.9 million cubic meters of material).
- Ancillary operational facilities (consisting of maintenance housing, work area, car parking etc).



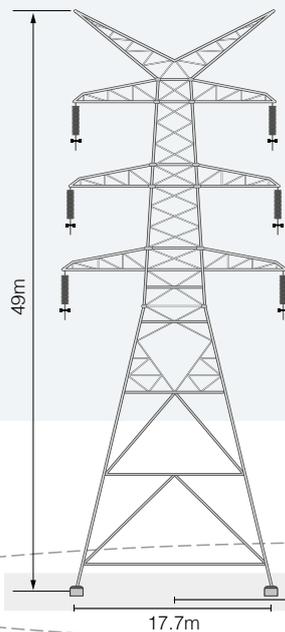
The Project's generation site will connect to the existing Armidale-Kempsey 132kV Line 965 owned by TransGrid.

Want to know more?

See EIS chapters:

- Chapter 3: Description of the Project
- Appendix G: Detailed Project Description

Double Circuit
330kV Transmission
Towers design



Single Circuit
132kV Transmission
Towers design

TRANSMISSION INFRASTRUCTURE

- Connection works:
 - Approximately 15km long transmission alignment (connecting to the existing upgraded Armidale-Kempsey 132kV line 965 that is to be upgraded by Transgrid so the Project can connect.
 - Double circuit towers – 330kV.
 - Single circuit towers – 132kV.
- Substation and associated connection infrastructure of up to 330kV rating.
- Switchyard (high voltage connection linking the connection transmission lines to underground power station complex).

Proposed Construction Activities

The proposed construction of the Project has numerous overlapping phases and stages and will be delivered in line with prevailing conditions of approval, management plans, and ongoing community engagement. It is anticipated that construction work will span approximately five years.

Various activities and methodologies will be utilised to enable the construction of the Project. Due to the nature of the Project, construction activities will occur at both surface and below ground.

Surface works will primarily involve conventional earth or civil works associated with the establishment of the infrastructure, such as access roads, dams, and tunnel portals. Underground works will primarily involve blasting, tunnelling and excavation works for power station caverns, access tunnels and power waterways.

PRE-CONSTRUCTION

- Establishment of site access roads and bridge.
- Preparation of environmental management plans.
- Obtaining secondary approvals.
- Completion of detailed design.
- Ongoing community consultation activities.

Core sample drilling was undertaken to establish the bedrock conditions before designing the underground power station.



SITE ESTABLISHMENT

- Construction of access roads.
- Establishment of erosion and sediment controls.
- Establishment of site utilities.
- Establishment of site offices and compounds.

VEGETATION CLEARING AND EARTHWORKS

- Clearing of sections of the disturbance footprint to allow for the construction of temporary and permanent infrastructure (temporary areas will be rehabilitated).
- Earthworks.
- New access roads.
- Bridges.
- Establishment of site pads.
- Installation of plant and equipment.

TUNNELLING

- Tunnels using a range of excavation techniques including drilling and blasting.

CAVERN EXCAVATION

- Excavating the cavern that will house the power station.

QUARRYING

- Rockfill for dams.
- Road base.
- Concrete aggregate.
- Increasing the capacity of the reservoirs (if suitable).

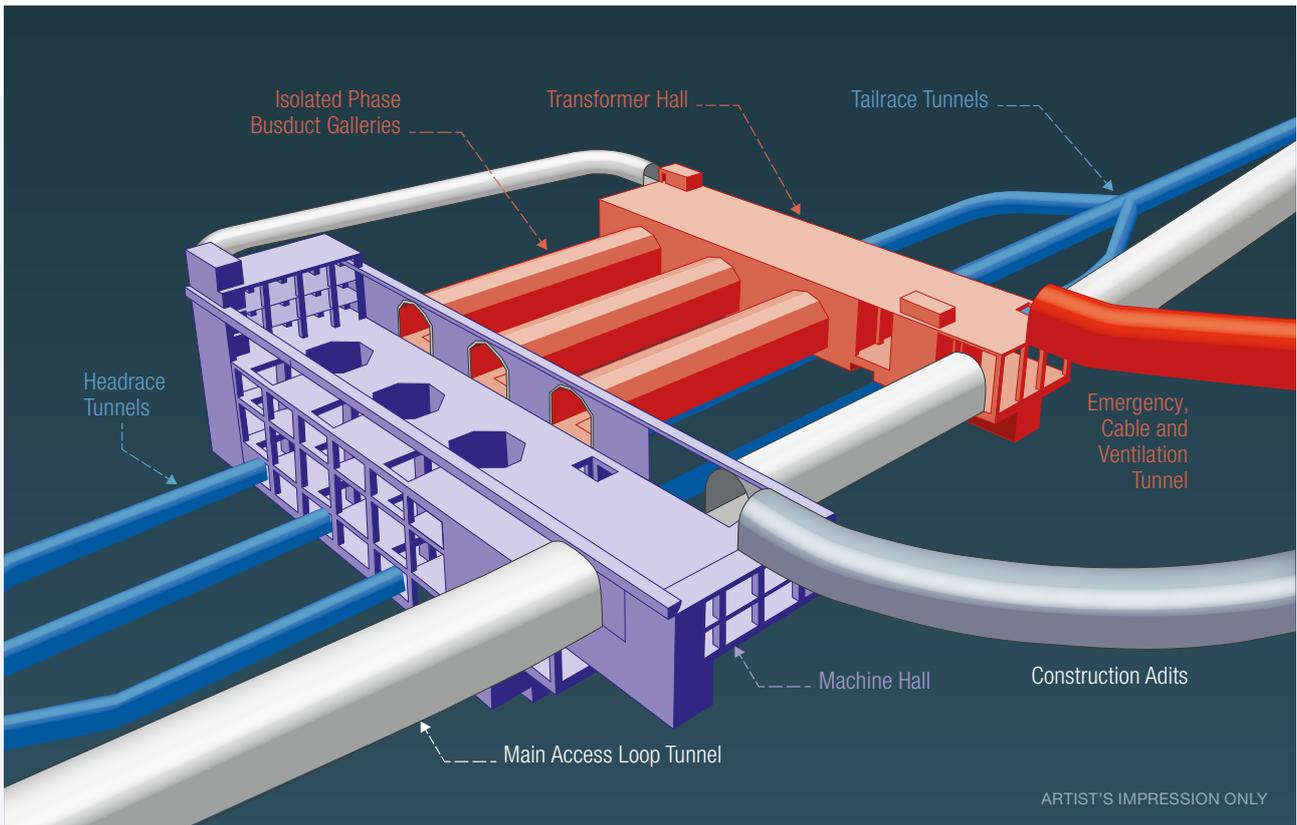
DAM CONSTRUCTION

- Installation of creek diversions and coffer dams.
- Excavation of dam for foundations and abutments.
- Construction of dam walls, crests, and spillways.
- Initial reservoir fill (expected 6 - 9 months).

Want to know more?

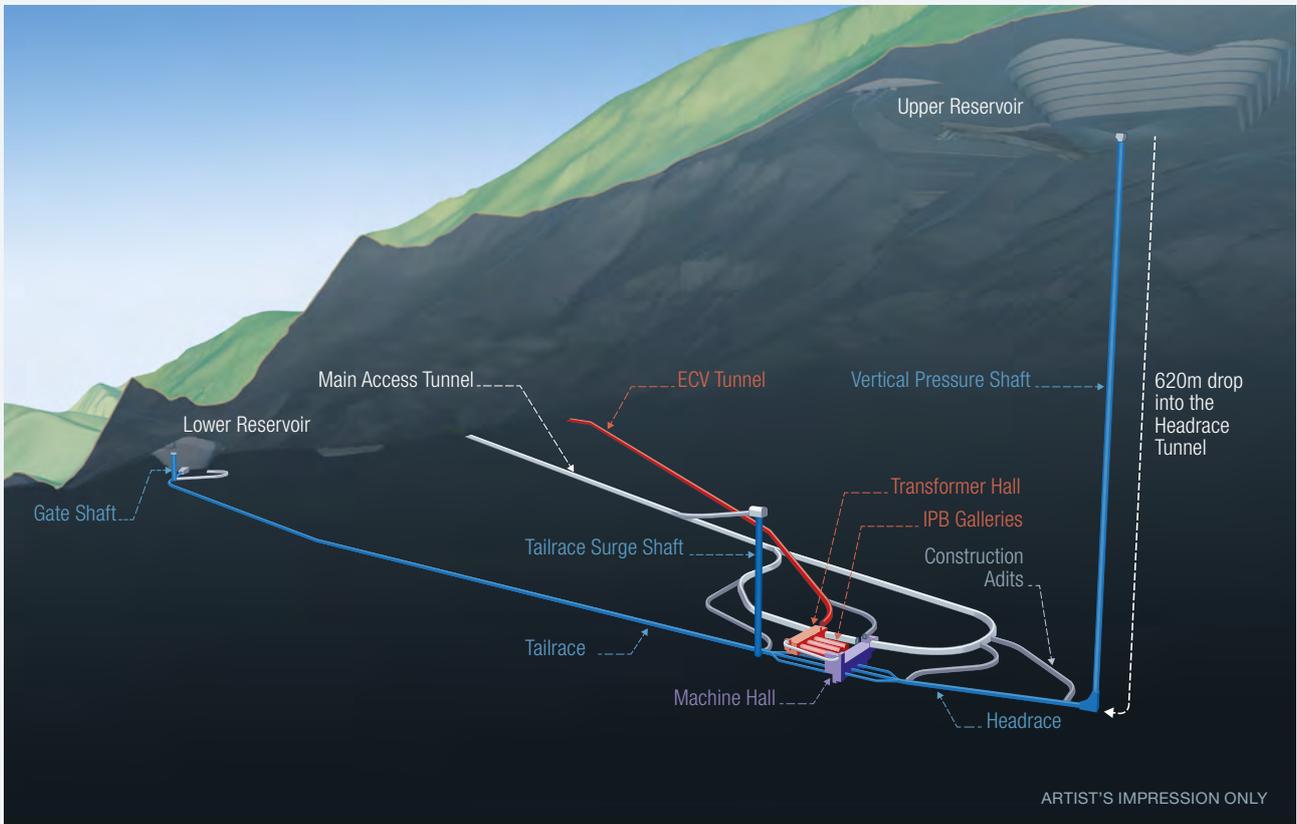
See EIS chapters:

- Chapter 3: Description of the Project
- Appendix G: Detailed Project Description



ARTIST'S IMPRESSION ONLY

The underground Machine Hall will house the Hydropower Turbines (e.g., reversible Francis turbines) and the Transformer Hall will house the equipment to export the generated electricity to the surface and out into the grid via the Switchyard.



ARTIST'S IMPRESSION ONLY

Underground works will use blasting and drilling techniques. The dam walls will be constructed using as much of the excavation spoil as possible.

COMMUNITY CONSULTATION

Stakeholder and community consultation is integral to the successful planning and delivery of all major projects. Open, ongoing, and accessible consultation ensures that projects are developed with consideration given to local and regional feedback.

STAKEHOLDER ENGAGEMENT CONTEXT

Since 2017, the Project has proactively engaged with the community, stakeholders, and industry in the local region. This has included multiple engagements with community members and stakeholders in the Armidale, Hillgrove, Ebor, Lower Creek, Bellbrook, Willawarrin, Kempsey, Frederickton, and South West Rocks areas.

Consultation continued following the declaration of the Project as Critical State Significant Infrastructure in 2020. The issuing of the Secretary's Environmental Assessment Requirements (SEARs) in 2021 (amended in 2022) set the requirements for a comprehensive consultation program, which sought to identify and respond to community interests and concerns associated with project planning, construction, commissioning, and operation.

IDENTIFYING STAKEHOLDERS

The International Association for Public Participation defines a stakeholder as “any individual, group of individuals, organisations, or political entity with a stake in the outcome of a decision”. Key stakeholders on the Oven Mountain Project include:

- Local landowners.
- Traditional Owners and groups.
- Local councils.
- Government agencies.
- Local businesses.
- Environmental, industry and community groups.
- Transmission network service providers.
- Representatives of neighbouring and related projects.

HOW WE ENGAGED

The primary aim of community consultation is to raise awareness of the Project and encourage broad and informed involvement from all stakeholders in the planning process.

- Kempsey Community Information Hub.
- Community toll-free information line (1800 518 194).
- Community project email (info@ompshydro.com).
- Project website (www.ompshydro.com).
- Project social media (Facebook and LinkedIn).
- Project animation and videos.
- Project factsheets (printed and digital).
- Project newsletters (printed and digital).
- Project maps (printed and digital).
- SMS works notifications.
- Newspaper advertisements.
- Radio advertisements and interviews.
- Community drop-in and information sessions.
- Community virtual meetings.
- Sponsorship of community events (e.g., business, sport, social).
- Stakeholder meetings.

Want to know more?

See EIS chapters:

- Chapter 5: Consultation
- Appendix C: Statutory Compliance
- Appendix D: Community Engagement Table



Kempsey Community Information Hub



Website, email and social media



Newspaper and radio advertisements



Face-to-face meetings



Community information sessions



Engaging with local and regional schools.



Meeting face-to-face with landowners.



Supporting regional shows.

Supporting community events, such as International Women's Day.



Sponsoring local events

KEY EIS FINDINGS

The Oven Mountain Project will include the construction of pumped hydro generation infrastructure, transmission infrastructure, and associated auxiliary works. All projects of this scale inevitably result in changes to the local environment and community.

The EIS not only considers the potential environmental, social, and economic impacts of the Project, but also identifies measures to avoid or mitigate these impacts.

The Project will incorporate environmental management and design features to ensure that potential impacts are managed and mitigated as far as practicable. Most potential construction related impacts will be effectively mitigated by the implementation of best practice construction management procedures and plans.

During construction, environmental performance will be managed through the Construction Environmental Management Plan (CEMP).

Want to know more?

See EIS chapters:

- Chapter 6: Assessment of Impacts
- Chapter 7: Evaluation
- Appendix E: Proposed Mitigation Measures

The Project used specially trained dogs to help identify koala habitats and ensure the well-being of all animals.



Terrestrial Ecology

Extensive biodiversity surveys within the Project's footprint were undertaken in 2020, 2021, 2022, and 2023. These were carried out in parallel with and informed the evolution of the Project's design. This process has ensured the avoidance and minimisation of biodiversity constraints where possible. The resulting Biodiversity Development Assessment Report (BDAR) forms part of the EIS.

POTENTIAL IMPACTS

The BDAR considers species and communities under both the NSW and Federal legislation.

The Project will impact approx 328 hectares of vegetation of varying condition, which includes approx 7 hectares of threatened ecological communities. Four threatened flora species and 11 threatened fauna species were recorded within the disturbance footprint. The Project is expected to impact approx. 0.002 hectares of critical habitat for the Brush-tailed Rock-wallaby and 0.74 hectares of *Pultenaea rubescens* habitat.

MITIGATION MEASURES

Avoidance and minimisation measures incorporated into the Project's design have significantly reduced impacts. Remaining ecosystems and species that are impacted must be compensated for under the biodiversity offsets scheme.

Additional mitigation measures will be incorporated into management plans.

The Project requires 8,055 ecosystem credits to compensate for impacts on native Plant Community Types (PCTs) and ecosystem credit species. In addition to ecosystem credits, the Project also requires a total of 42,178 species credits.

The Project's biodiversity offsets strategy is based on protecting and managing a significant amount of land surrounding the disturbance footprint under a biodiversity stewardship agreement.

Want to know more?

See EIS chapters:

- Chapter 6: Assessment of Impacts
- Chapter 6.2: Terrestrial Ecology
- Appendix H: Biodiversity Development Assessment Report

Aquatic Ecology

An Aquatic Ecology Impact Assessment of the Macleay River and its associated tributaries and underlying groundwater has been conducted by the Project. This work included both desktop and field survey work (March and June 2022) and sought to obtain information on potential direct and indirect impacts from the construction and operation of the Project.

POTENTIAL IMPACTS

Specific assessments were done to evaluate the impacts on:

- Southern Purple-spotted Gudgeon.
- Manning River Helmeted Turtle.
- Key fish habitats.
- Broader aquatic diversity.

It was concluded that the Project is unlikely to significantly impact these species, habitats and aquatic diversity within the Macleay River and associated waterways.

The Project team conducted extensive aquatic ecology investigations on the Macleay River, its associated tributaries, as well as groundwater sources.

MITIGATION MEASURES

Proposed mitigation measures to minimise any potential impact include further field sampling, monitoring surface water flow and quality, and installing 'fish friendly' infrastructure for all water extraction activities.

Further consultation with the Department of Primary Industries – Fisheries will occur to ascertain whether aquatic ecology offsets are needed.

The overall finding is that, following the implementation of the above mitigation measures, it is unlikely that the Project will have any significant direct or indirect impacts to aquatic ecology.

Want to know more?

See EIS chapters:

- Chapter 6: Assessment of Impacts
- Chapter 6.3: Aquatic Ecology
- Appendix J: Aquatic Ecology Impact Assessment



Aboriginal Heritage

The Project is located within country traditional to the Thunggutti Aboriginal community. Aboriginal heritage assessment is an important component of Project infrastructure planning and development.

Consultation with local First Nations representatives, paired with an extensive program of ground-truthing, was completed. Archaeological field surveys and test excavations were conducted to explore and document objects, sites, and places, as well as cultural values mapping.

The environment within the Project area contains a variety of resources, including flora and fauna, that would have been historically used by First Nations people for food, medicinal, totemic, and cultural purposes.

POTENTIAL IMPACTS

An Aboriginal Cultural Heritage Assessment (ACHA) has been prepared, which contributed to the ongoing design of the Project. It identified 44 sites and locations within or nearby the Project area, some of which require further investigation:

- 19 of these sites could be potentially adversely affected.
- 12 of the 19 sites would be subject to direct impacts resulting in their complete or partial loss.
- Some 25 sites, including some of moderate and high significance, would be unaffected (for example, the access road was re-designed to avoid an axe production site).
- East Kunderang Pastoral Station and the highly significant Carrai waterholes, both situated outside the Project area, would be unaffected.

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.



See EIS chapters:

- [Chapter 6: Assessment of Impacts](#)
- [Chapter 6.4: Aboriginal Heritage](#)
- [Appendix K: Aboriginal Cultural Heritage Assessment](#)



Site investigations formed an integral part of cultural heritage work.

REGISTERED ABORIGINAL PARTIES

Since September 2021, the Project team has worked closely with 19 Registered Aboriginal Party (RAP) organisations and/or individuals.

RAPs play an important part in the development of all major infrastructure projects. As recognised primary knowledge holders, they provide guiding advice, skill, and experience on matters relating to Aboriginal places or Aboriginal objects in their region.

The RAPs for the Oven Mountain Project include many individuals and/or organisations based in Bellbrook, Armidale and/or surrounds, as well as a smaller proportion that are based in Sydney, Gunnedah, and Wollongong, but have ancestral connections to the region.

The RAPs for the Project were identified through the formal notification as part of the Heritage NSW consultation requirements and/or through contacting the Project following word of mouth within the local Aboriginal community.

To find out more about the role of RAPs and the Cultural Heritage process, view Chapter 6.4 and Appendix K of this EIS.

MITIGATION MEASURES

OMPS has committed to avoid where possible any impacts to Aboriginal sites or objects within the disturbance footprint that are identified as moderate or of high significance. Where impacts are unavoidable, mitigation measures will be implemented.

Additional consultation and further site and field investigations will form part of an Aboriginal Cultural Heritage Management Plan (ACHMP) which will be prepared prior to construction and implemented to guide the process for management and mitigation of impacts to Aboriginal sites and objects.

Historical and National Heritage

There are no listed heritage items in the immediate Project area. However, there are important listed and non-listed historic and national heritage features in the vicinity of the Project area which relate to grazing and farming activities, natural landscapes, historical grazing routes and homesteads. These include:

- East Kunderang Pastoral Station.
- Gondwana Rainforests of Australia (GRA).
- The National Trail.
- Aboriginal Stockman Routes.
- Long Flat Station.
- Travelling Stock Camp.

The only historical structures in the Project area are those associated with previous occupation and farming activities at Long Flat Station. However, these structures have been largely demolished.

Part of the Project area is located adjacent to the curtilage of the Gondwana Rainforests of Australia (GRA), a National Heritage and World Heritage place. A Heritage Impact Assessment (HIA) has been prepared to assess the potential for the Project to impact National and World Heritage values.

The Project will not impact East Kunderang Station or the National Trail.



POTENTIAL IMPACTS

The Project will alter part of the existing cultural landscape, which consists of cleared fields, river crossings, fences, and archaeological sites, and is currently a landscape that remains partially recognisable from its early historical phase.

However, overall, the historic heritage assessment undertaken determined the Project poses a low impact to the heritage significance of the Project area.

The Project will not impact East Kunderang Station or the National Trail.

The portion of GRA near the Project area is the Hastings-Macleay Group. It encompasses, amongst other areas, part of the Oxley Wild Rivers National Park. 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.

No direct impacts to National Heritage and World Heritage places have been identified.

MITIGATION MEASURES

Construction and operational planning would aim to minimise the potential impacts on historical and national heritage items as much as possible. Where impacts are unavoidable, mitigation measures will be implemented.

While no significant impacts have been identified, the Project will prepare a Historic Management Plan to minimise the potential for impacts during construction.

Want to know more?

See EIS chapters:

- Chapter 6: Assessment of Impacts
- Chapter 6.5: Historic Heritage
- Chapter 6.11: National Heritage Values
- Appendix L: Statement of Historic Assessment

Water

Water is an important resource both for construction and operation of the Project – as well as for the surrounding local and regional communities.

Both surface water and groundwater impact assessments were carried out to identify potential impacts. The Project has been conducting baseline water monitoring and sampling since mid 2021.

HYDROLOGY (MACLEAY RIVER AND FINGERBOARD CROSSING CREEK STREAMFLOW)

The Macleay River is a perennial watercourse with a catchment area of approximately 11,400 km². An initial fill of the Project reservoir is expected to take 6 - 9 months. This water will move in a closed loop between the reservoirs with the occasional need for top-up. Water take from the Macleay River will be subject to strict conditions including high flow only periods.

Impacts to the streamflow of the Macleay River are anticipated to occur when extracting water (6,500 ML) for the initial one-off fill of the Project reservoirs. The initial fill will represent only 1% of the average annual streamflow volume in the Macleay River adjacent to the Project area.

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). Extraction for these purposes is predicted to result in a maximum water level reduction of 0.05m. Changes to sediment transport within the Macleay River are also minor in the short term (during water extraction) and negligible in the longer term.

The Project reservoirs are located on an ephemeral (i.e., mostly dry) water course called Fingerboard Crossing Creek. Impacts from Project-related discharges and the reduction in contributing catchment area due to impounding Fingerboard Crossing Creek are negligible given the relative size of the Macleay River upstream catchment.

The streamflow regime in Fingerboard Crossing Creek will cease immediately below the upper dam. This impact will reduce further downhill, with only a 13% reduction in streamflow modelled at the lower dam and reservoir location.

Importantly, the Project is expected to have minimal impact on the security and quality of water supply to downstream water users, noting town water supply at Bellbrook is nearly 70km downstream and Kempsey is over 140km downstream.



Water level and quality monitoring will be ongoing throughout construction.

GROUNDWATER INTERCEPTION

For groundwater, the predicted water table drawdown is due to groundwater flow into the underground project features (i.e., the power waterway, reservoirs, access tunnels and the underground power station). These impacts have been rigorously and conservatively assessed; are localised to the Project area; and primarily occur during construction.

Potential impacts on specific sites have also been assessed. Drawdown at the Carrai Waterholes (over 4km south-east of the Project) is not predicted to occur and no impacts are predicted to other groundwater users (e.g., at the East Kunderang Homestead bore).

Groundwater dependent ecosystems (GDEs) which are entirely dependent on groundwater were observed to exist approximately 800m from the Project at their closest point and the drawdown is not expected to impact them. The risk of impact on GDEs which have an opportunistic reliance on groundwater (i.e., also rely on surface water) is low. There is also considered to be a low risk of impacts to stygofauna (i.e., fauna living in rock fissures etc).

WATER QUALITY

Controlled discharges to local watercourses and the Macleay River will comprise of treated water from the process water and wastewater management systems during construction. The rigorous treatment measures are expected to minimise water quality risks to the immediate receiving waters.

Seepage from the spoil emplacements (mostly after rainfall) has the potential to increase acidity of runoff or leach metals from the rock. As a result, the water quality immediately downstream of the spoil emplacements may have elevated concentrations of aluminium and iron, but will be substantially diluted as one moves downstream. It is unlikely to materially change the existing water quality of the Macleay River.

OVEN MOUNTAIN PUMPED HYDRO ENERGY STORAGE

6.5 Gigalitres (Lower Reservoir)
21 Hectares (full supply level)

STEUART MACINTYRE DAM

2.5 Gigalitres
29 Hectares

CHAFFEY DAM

102 Gigalitres
600 Hectares

KEEPIT DAM

425.5 Gigalitres
4,370 Hectares

SYDNEY HARBOUR

500 Gigalitres
5,500 Hectares

COPETON DAM

1,280 Gigalitres
4,600 Hectares

1%

IMPACTS ON STREAMFLOWS

Based on the Macleay River's average streamflow, the water required for the initial fill of the Lower Reservoir during construction would be less than **1% of the average annual streamflow** at the project location.

The streamflow of a river varies along its length. The initial fill will result in a maximum streamflow reduction of 12.6% at the project location, only while extraction is occurring.

Aside from top-ups, there would be no impact on the Macleay River's water volume once the project is operational. During a flood event no additional water would flow into the river other than what would normally come from the catchment surrounding the project site.

MITIGATION MEASURES

Management and mitigation measures will be employed during construction of the Project to minimise potential impacts, with ongoing monitoring undertaken to validate the effectiveness of those measures.

Water requirements for the Project have been identified and will be met primarily from surface water sources, with the main source for the initial storage fill being unregulated flows from the Macleay River. A water licensing strategy has been prepared for the Project and demonstrates that water supply from both surface and ground water sources can be appropriately managed throughout the Project lifecycle.

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.



See EIS chapters:

- Chapter 6: Assessment of Impacts
- Chapter 6.6: Water
- Chapter 6.12 Hazards
- Appendix N: Groundwater
- Appendix M: Surface Water Assessment
- Appendix I: Groundwater Dependent Ecosystems Assessment

KEY EIS FINDINGS

Land

A Land, Soil and Erosion Assessment (LSEA) and Land Use Conflict Risk Assessment (LUCRA) have been prepared for the Project to evaluate potential impacts on soils, land use and geotechnical stability of the site; and to provide a rehabilitation strategy. The regional mapping shows that the local soils are predominantly Tenosols and Kandosols; this was confirmed through a field survey of local soils. There are no acid sulfate soils mapped in the Project area.

POTENTIAL IMPACTS

The agricultural viability of soils in the Project area was found to be limited. An erosion hazard risk assessment, including completing soil loss calculations and classes, was conducted.

Erosion hazard was noted as high for areas of the Project where slopes exceed 12%. Extremely high erosion hazard applies to slopes with gradients greater than 22% to 35%.

The erosion risk assessment generally demonstrated 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, if left unmitigated.

MITIGATION MEASURES

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. These plans will detail relevant mitigation measures such as minimising the extent and duration of soil disturbance, sediment controls and rehabilitation works.

The greatest potential for land use conflicts with the Project were identified as risks associated with traffic-related safety and fire. Management strategies including the development, implementation and review of a Bush Fire Emergency and Evacuation Plan are recommended to manage these potential conflicts.

Spoil placement is proposed within the disturbance footprint and would be rehabilitated to form part of the final land use. The design and rehabilitation of the placement areas would ensure ongoing stability of the landforms.



Geotechnical investigations in the upper and lower reservoir areas were conducted over several years.

UNDERSTANDING SOIL CHEMISTRY

The Oven Mountain Project team recognises the concerns raised by some community members regarding the presence of arsenic and antimony in surface water within some parts of the Macleay River catchment.

It is acknowledged that this presence is likely caused by leaching from historic mining activities, for example, near Bakers Creek approximately 60km upstream from the Oven Mountain site.

For the last several years, Oven Mountain hydrogeologists have been sampling water and material from a network of close to 40 locations both on and near to the site.

The results of these extensive investigations are provided in section 6.7 and Appendices O and P of this EIS and analysis indicates a low presence of arsenic or antimony relative to guidelines. The risk of increasing metal concentrations due to leaching is considered low.

Want to
know
more?

See EIS chapters:

- Chapter 6: Assessment of Impacts
- Chapter 6.7: Land
- Appendix P: Land, Soils and Erosion Assessment
- Appendix O: Geochemistry Assessment
- Appendix Q: Rehabilitation Assessment
- Appendix AA: LUCRA

Transport

Constructing new infrastructure for the generation and electricity transmission elements of the Project will result in increased vehicle movements to and from site during construction. This in turn will necessitate the creation of measures to manage transport and access arrangements and mitigate impacts to the local and regional community.

A strategic road review was undertaken for the Project to identify a feasible and safe access route for construction activity. The main access route to the Project site has been selected via Kempsey and a new Eastern Access Road (EAR) is proposed to connect the Project site to the Kempsey Armidale Road. The EAR will avoid the narrow and constrained sections of the Kempsey Armidale Road (e.g., at Flying Fox Cutting). The designated heavy vehicle haulage route runs off the Pacific Highway at Frederickton.

POTENTIAL IMPACTS

Construction activity and traffic is expected to peak in mid-2027 (assuming 2024 commencement); there is the potential for this to result in minor disruptions and delays to local traffic. The average peak daily vehicle trips is estimated to be:

- 64 heavy vehicles.
- 155 light vehicles.

A 'trip' refers to one inbound movement plus one outbound movement.

The average daily traffic count will ramp down as the Project reaches completion. It is expected that operational traffic will have minimal impact to the local and regional roads. The Project includes construction work accommodation on-site and most personnel are expected to travel to site by bus.

MITIGATION MEASURES

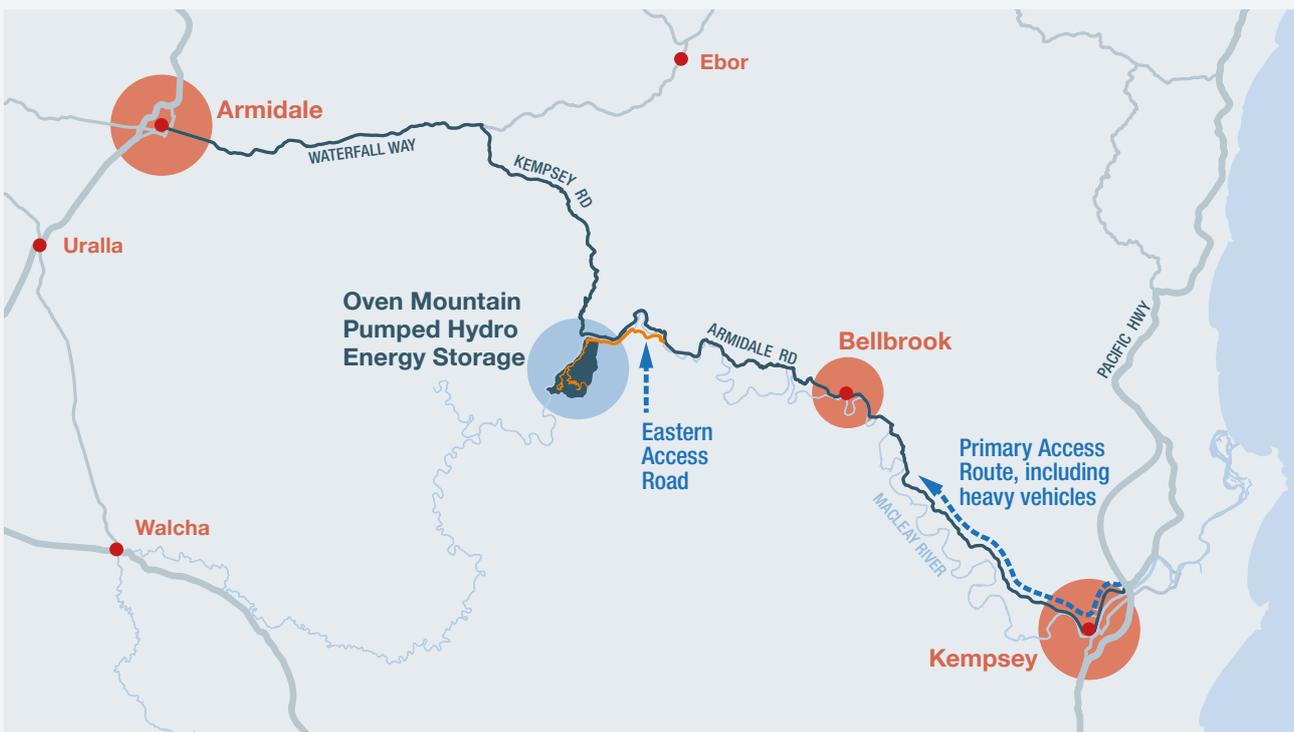
Australian design standards have been met for the majority of the roads along the haulage route. Road sections that do not currently meet design standards are predominantly near the immediate Project area where it may be necessary to implement traffic control measures and improvements to the Kempsey Armidale Road.

A detailed Construction Traffic Management Plan (CTMP) will be prepared – in collaboration with relevant road authorities – for the Project to manage and mitigate any potential impacts.

Want to know more?

See EIS chapters:

- Chapter 6: Assessment of Impacts
- Chapter 6.8: Transport
- Appendix R: Traffic Impact Assessment



Amenity – Visual and Landscape

The landscape in and surrounding the Project area is dominated by four Land Character Zones (LCZs) – Macleay River valley, valleys, upper slopes, and plateau.

POTENTIAL IMPACTS

The key visual amenity impacts of the Project are associated with the introduction of new infrastructure into the landscape. The visual impacts may be experienced both during construction and operation of the Project.

Ten representative viewpoints were selected and assessed from locations near residences and main roadways and visitor destinations near the Project for potential impacts.

Construction sites are expected to be shielded from view by natural ridgelines and the curve of the Macleay River Valley – with the only potential impact being due to temporary light glow from unshielded lighting fixtures. Impacts on LCZs are predicted to range from negligible to low, except for upper slopes where impact is moderate in the small area where the Project is located.

The table below details potential visual impacts from the main areas that were assessed.

Viewpoint	Location	Predicted Visual Impact
Residences	North of the Project area	Nil to Low
East Kunderang Homestead	Oxley Wild Rivers National Park	Nil
Marys View	Oxley Wild Rivers National Park	Moderate – distant views of some aspects of the Project infrastructure, but not the pumped hydro energy storage system itself.
George's Junction Campground	George's Junction	Moderate – occasional views of access road, powerline Project accommodation camp, laydown areas and office structures
National Trail	East of the Project area	Low – reservoirs and operations buildings

MITIGATION MEASURES

Although the visual landscape will be altered due to the Project, the design of the development and location of infrastructure has and will continue to evolve to minimise visual and landscape impacts where possible.

The Project has identified mitigation measures for improving the visual amenity impact. These measures will be implemented during the detailed design phase and may include practices such as minimising vegetation clearing and using light shield fittings.



See EIS chapters:

- Chapter 6: Assessment of Impacts
- Chapter 6.9: Amenity
- Appendix S: Landscape and Visual Impact Assessment

Visual impact as seen from George's Junction campground



Visual impact as seen from Marys View



Visual impact as seen Kunderang East Homestead



Amenity – Noise and Vibration

Existing ambient noise surrounding the Project area is dominated by rural noise sources and natural elements with intermittent road traffic noise – it was rated low at 35 decibels and 30 decibels for daytime and night-time periods respectively. This provides a stringent noise target for the Project to adhere to.

POTENTIAL IMPACTS

Construction typically requires the use of heavy machinery, which can generate high noise and vibration levels. The potential impacts may vary greatly depending on the intensity and location of construction activities, the type of equipment used, existing background noise levels relative to the receptor, terrain, and weather conditions.

Impacts to amenity resulting from noise and vibrations is anticipated to be limited to the construction phase of the Project, and might include:

- General construction activity noise.
- Construction vibration.
- Blasting.
- Road traffic noise.

Construction noise levels from the Project are predicted to satisfy standards at all assessment locations, except for two assessment locations where negligible exceedances (2 dB) are predicted during out-of-hour work periods under noise enhancing weather conditions.

There is the slight potential for sleep disturbance at these receptors as well where exceedances are 4dB – which is considered less than a ‘noticeable difference’.

Road traffic noise levels are predicted to satisfy the assessment requirements at all locations along the transport routes.

The potential for blasting vibration impacts on residences, residents and vibration sensitive structures near construction has also been assessed. All residences are beyond the safe working distances and blast offset distances for human response considerations. Therefore, it is unlikely vibration or blasting impacts on residential receivers will occur.

Operational noise impacts are predicted to be minimal.

MITIGATION MEASURES

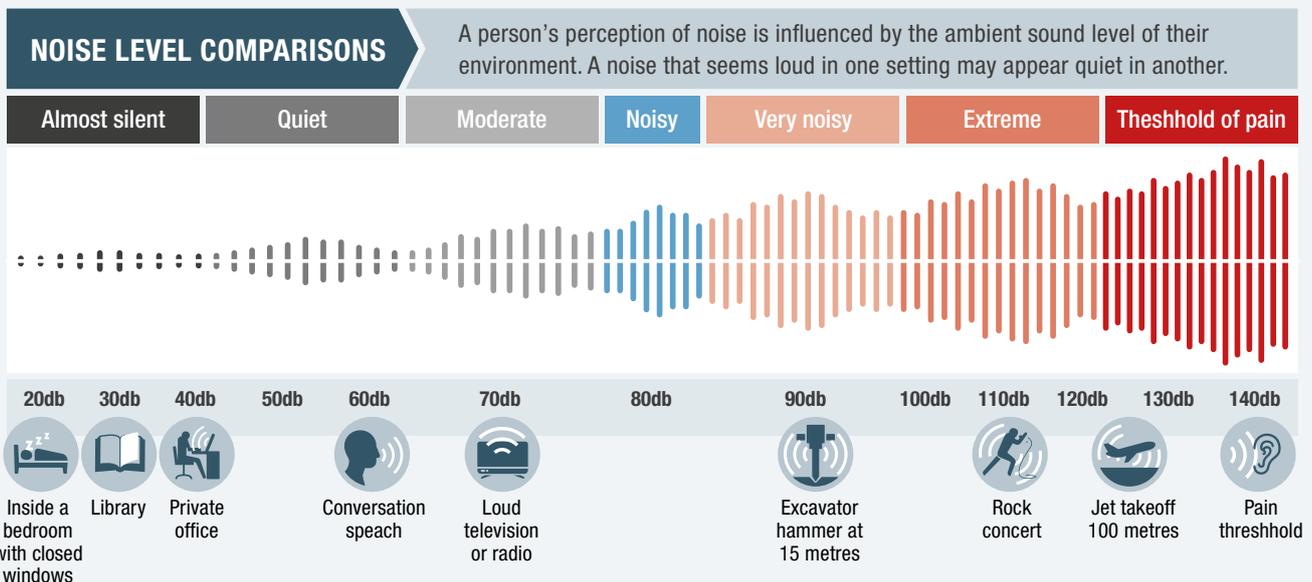
The contractor will identify feasible and reasonable mitigation measures that reduce construction noise levels where practical or limit construction to Interim Construction Noise Guideline standard hours only.

With the effective management and incorporation of mitigation measures, noise and vibration emissions from the Project are generally predicted to satisfy relevant guidelines, standards, and policies.



See EIS chapters:

- Chapter 6: Assessment of Impacts
- Chapter 6.9: Amenity
- Appendix T: Noise and Vibration Impact Assessment



Air Quality

Agricultural practices, wind generated dust from exposed areas, bushfires and seasonal emissions from household wood burning have all influenced the local airshed and existing air quality.

During construction, emissions will be generated from earthworks, front-end loaders and excavators removing spoil, dozers working on spoil emplacement areas and the movement of trucks on unpaved roads.

POTENTIAL IMPACTS

An Air Quality and Greenhouse Gas Assessment (AQGHGA) has been prepared for the Project in accordance with the Approved Methods for the Modelling (EPA 2022). The AQGHGA considered a total of 55 locations, including a mix of residences, project accommodation, and recreational areas.

Emissions estimation and air quality dispersion modelling was completed for a 'worst case' construction scenario corresponding to peak construction activities for the Project. Emissions of total suspended particulates (TSP), particulate matter less than 10 micrometres (μm) in aerodynamic diameter (PM10) and particulate matter less than 2.5 μm in aerodynamic diameter (PM2.5) were estimated and modelled.

The modelling indicates that the predicted concentrations of TSP, PM10, PM2.5 and dust deposition levels are below the applicable impact assessment criteria at all assessment locations.

Cumulative impacts were assessed by combining modelled project impacts with recorded ambient background levels in the region. The cumulative results showed compliance for all pollutants at all assessment locations.

Importantly, the Project will have a beneficial impact on the National Electricity Market by providing significant savings of Green House Gas (GHG) emissions. Based on the Project generating around 1,188,000 megawatt hours (MWh) of electricity per year, offsetting will be approximately 400,000 tonnes of CO₂-e per year.

MITIGATION MEASURES

The Project will incorporate standard dust mitigation measures such as using water carts or the suppression of dust in dozer working areas, soil disposal areas and on unpaved roads within the generation site construction area.

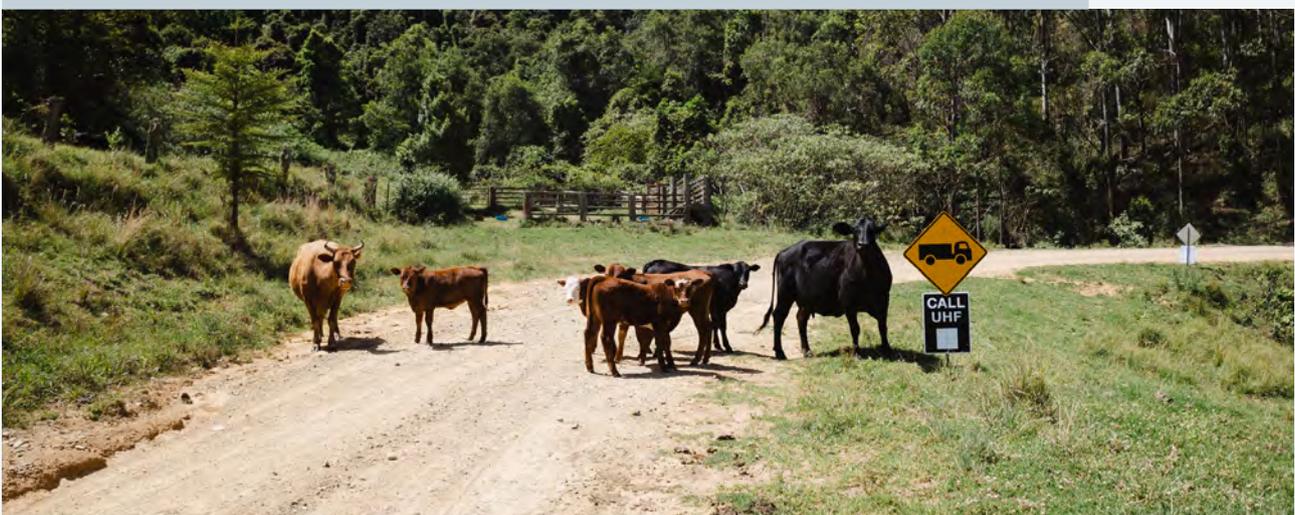
By adopting the necessary mitigation measures, air quality emissions and impacts from the Project are generally predicted to satisfy relevant guidelines, standards, and policies.

Want to know more?

See EIS chapters:

- Chapter 6: Assessment of Impacts
- Chapter 6.10: Air Quality
- Appendix U: Air Quality Impact Assessment

Agricultural practices and wind generated dust have all influenced the local airshed and existing air quality.



Hazards - Bushfires

The need to consider bushfire hazard is essential. The capacity for a fire to start and spread within the landscape can be assessed through consideration of vegetation, terrain, regional fire weather, historic fire occurrence, potential ignition sources (both external and internal), access and suppression.

The Project area is situated on the eastern edge of the New England Bush Fire Management Committee (BFMC) area and to the immediate west of the Lower North Coast BFMC and is located on bushfire prone land. A variety of vegetation types are present in and around the Project area, with the predominant vegetation formation being the 'Forest' formation.

POTENTIAL IMPACTS – BUSHFIRES

There are a range of potential ignition sources associated with the construction and operation the Project which will increase the probability of a bushfire being started on site. Ignition sources may include:

- Hotworks.
- Powerlines.
- Equipment or service failures.
- Vehicles and plant operation.
- Accidental ignitions.
- Ignitions of explosive or flammable material.

MITIGATION MEASURES – BUSHFIRES

A Bushfire Assessment has been prepared for the Project and includes important mitigation measures such as asset protection zones (APZs), water supply requirements, and emergency access and evacuation. A Bushfire Emergency and Evacuation Management Plan (BEEMP) will be prepared for the Project area.



See EIS chapters:

- Chapter 6: Assessment of Impacts
- Chapter 6.12: Hazards
- Appendix X: Bushfire Assessment Report

Hazards – Electromagnetic force (EMF)

EMF field measurements, narrowband measurements, and broadband magnetic field measurements, and radio frequency interference assessments were prepared for the construction of the proposed high voltage powerline and associated substation infrastructure. A series of baseline assessments were taken at each of four properties near the proposed transmission corridor.

POTENTIAL IMPACTS – EMF

The installation of the proposed high voltage transmission line and associated infrastructure has the potential to increase the electric and magnetic field exposure of personnel in the area. Significant electric and magnetic fields may also interfere with electronics equipment, which may result in degradation of performance or operation, and may cause malfunction.

No harmful phenomena were recorded during any of the measurements and the risk to the health and safety of persons around the four sites is negligible.

MITIGATION MEASURES – EMF

EMF hazards have been assessed and found to be negligible. After the HV powerline and associated substations have been installed, it is recommended that another EMF survey be conducted assuring compliance with the applicable health and safety and radio frequency interference requirements.



See EIS chapters:

- Chapter 6: Assessment of Impacts
- Chapter 6.12: Hazards
- Appendix Y: EMF and RFI Baseline Survey



Grazing animals around power generation facilities is common place throughout the world and provides a valuable co-landuse opportunity.

Hazards – Flooding

Flooding risks were assessed based on hydraulic modelling of the Macleay River. Flood flows within the Macleay River, near the Project area, normally follow the alignment of the river, due to the confined valley setting. During a 1-in-100-year event, flood levels within the Macleay River rise 15m above normal flow conditions and extend up to 200m each side of the river across the lower bank floodplain.

A dam break is an extremely unlikely event and impacts are lessened due to the Project's remote, off-river location. Nevertheless, a preliminary dam break assessment has been conducted and more work will be carried out alongside detailed design in accordance with stringent guidelines.

POTENTIAL IMPACTS – FLOODING

Most of the Project infrastructure is located above the 0.01% annual exceedance probability Macleay River flood level (1-in-10,000 year event) and therefore has a low risk of causing flood impacts. An exception is the low-level bridge proposed across the Macleay River to provide site access. This structure is anticipated to be inundated once a year on average for approximately 20 hours duration, with only highly localised exacerbation of flood levels.

The preliminary dam break assessment concluded the volume of water from an upper reservoir dam break would be captured within the lower dam reservoir. The volume of water from a lower reservoir dam break is comparatively small relative to a natural flood event for the Macleay River and the magnitude of impact significantly decreases as it travels downstream. It is therefore very unlikely to affect the communities of Lower Creek and Bellbrook which are respectively nearly 20km and 70km downstream.

MITIGATION MEASURES – FLOODING

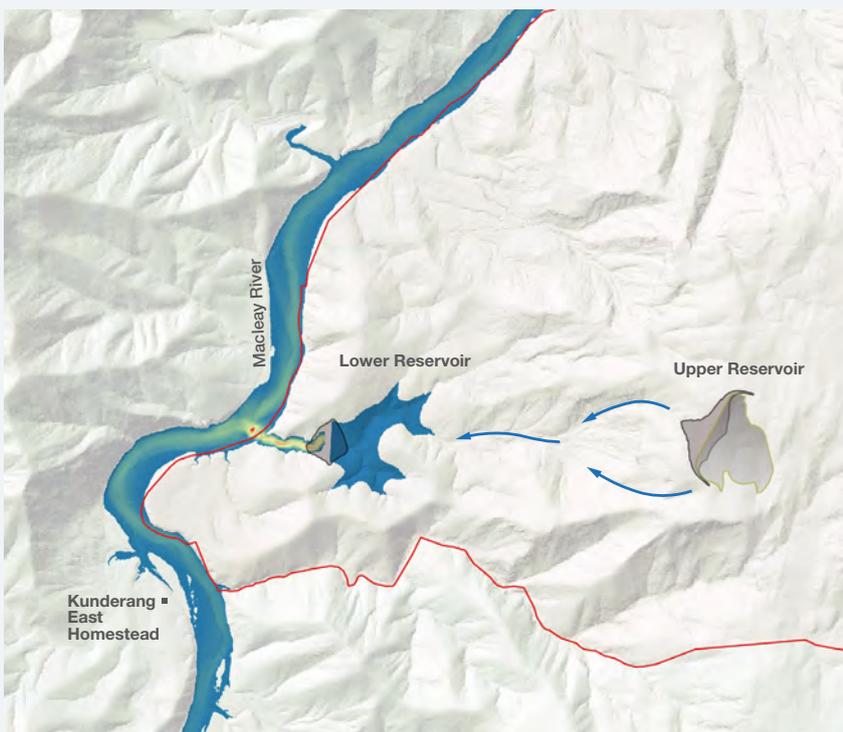
Mitigation measures addressing natural flooding and flooding in the event of a dam break further reduce these risks. Mitigation measures may include:

- Construction of a coffer dam and diversion tunnel upstream of dam and reservoir areas.
- Development of a Flood Management Plan which will include comprehensive risk management procedures.

Want to know more?

See EIS chapters:

- Chapter 6: Assessment of Impacts
- Chapter 6.12: Hazards
- Appendix M: Surface Water Assessment



Natural floods (for example, a 10-year return period flood) result in significantly more flow in the Macleay River than a dam break. Natural floods are sustained for the duration of the rain event, which may be a number of days.

A dam break event sends a pulse of water into the river. The increased flow, velocity (flow speed) and depth would be attenuated rapidly as the water travels downstream.

Once at George's Junction, the surge water level is predicted to be less than the 10-year flood line.

Failure of the Upper Reservoir would result in water flowing into the Lower Reservoir through the natural catchment.

Both dams would not be full at the same time.

Social

Social impacts and benefits associated with the construction and operation of the Project have been identified through primary and secondary research by qualified social scientists and included in a Social Impact Assessment (SIA). The assessment has been prepared in accordance with the *Social Impact Assessment Guideline for State Significant Projects* (DPIE 2021).

POTENTIAL IMPACTS AND BENEFITS

The Project is predicted to have various social impacts and benefits, accruing particularly in the local area but also in more urban areas across the region.

The potential local impacts and benefits identified include impacts related to:

- Disruptions to community cohesion during construction.
- Amenity (dust, noise, and visual amenity).
- Increased traffic during construction.
- Perceived impacts on water use and management.
- Demands on social infrastructure and services, housing, and accommodation.

The most significant positive social benefits of the Project relate to:

- Strengthening the electricity grid network.
- Applying downward pressure on customer power prices.
- Employment, skills, and training opportunities.

- Local and regional business and industry opportunities.
- Improved road conditions, including upgrades to the Kempsey Armidale Road.
- Improved access to telecommunications and power stability for the local community.
- Meaningful opportunities for First Nations peoples, communities, and businesses.
- Reduced bushfire risk due to improved road conditions and water from the Project being accessible to the RFS for firefighting.

MITIGATION MEASURES

To ensure the effectiveness of the management measures for the identified social impacts and benefits, a continuous improvement approach would be adopted allowing for the review and adaptation of impacts, management measures and outcomes. This adaptive approach will enable the management of social impacts identified to minimise negative social impacts and maximise benefits for the community.



See EIS chapters:

- Chapter 6: Assessment of Impacts
- Chapter 6.13: Social
- Appendix W: Social Impact Assessment

The Project will create meaningful opportunities for First Nations peoples, communities and businesses.



Economic

The Project will provide considerable economic value in the form of employment and training opportunities; community benefit schemes; improved infrastructure; and downward pressure on electricity prices.

POTENTIAL IMPACTS

Impacts are expected to be mainly positive and driven by an increase in demand for materials, services, and employees. Some negative impacts may also arise in the short term, such as an increase in competition for labour and other resources resulting in wage and price rises and shortages of supply to other related sectors such as local housing.

CONSTRUCTION PHASE

The Economic Assessment concluded that, on average, the construction of the Project will contribute approximately \$248 million in annual regional direct and indirect output, increasing to \$535 million annually overall within the NSW economy. This is expected to occur each year over the four to five-year construction period.

Construction is expected to generate over 600 direct and indirect jobs within the regional economy, increasing to over 1,600 such jobs across NSW.

OPERATIONAL PHASE

During the operational phase, the Project 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.

A market benefits report commissioned to assess the potential benefits of the Project to the New England REZ and NEM more generally indicated that in 2030-31, as a snapshot, the Project could reduce demand-weighted wholesale electricity prices by \$7–9/MWh in NSW and \$4–5/MWh in the other mainland regions which amounts to approximately a \$1 billion reduction in total mainland customer retail bills.

MITIGATION MEASURES

Adverse impacts can be mitigated through initiatives such as preferential procurement of goods and services regionally, partnerships with local councils and on-site accommodation to relieve pressure on local housing stock.

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. Community benefit schemes are currently under discussion with both councils.

Overall, the economic and employment benefits of the Project on both the regional and NSW economies are anticipated to be considerable.

Want to know more?

See EIS chapters:

- Chapter 6: Assessment of Impacts
- Chapter 6.14: Economic
- Appendix Z: Economic Assessment

The Project will look to engage the skills and experience of local and regional businesses.



Waste

The approach to waste management will be guided by the waste management hierarchy, with a focus on reducing resource use and minimising waste generation as the highest priority.

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 operational phase.

POTENTIAL IMPACTS

The main activities that generate waste during construction include:

Quarrying and tunnelling

It is estimated that the Project will excavate approx 5.5 million cubic metres of material, a large portion of which is expected to be re-used on-site in areas such as the dams. Total spoil is estimated to be 2.9 million cubic metres. Spoil is excess soil, rock or dirt excavated from the site.

While a large portion of this material will be reused for other purposes such as aggregate for the construction of the reservoir dam walls, unsuitable material will be disposed at spoil emplacement areas.

Rock excavated from the tunnels will be reused as rock fill in the dam wall construction.



These emplacement areas are permanent, will be land formed, and then rehabilitated at the end of construction of the Project.

Vegetation clearing

It is estimated the Project will clear approximately 330 hectares of vegetation. Some cleared vegetation will be used in surface works or be repurposed to provide wildlife habitats. The Project's rehabilitated, operational footprint is estimated to be around 270 hectares.

Operation of worker accommodation facilities

Food, general and recycled waste will be composted where practicable or transported off site to an appropriately licensed waste disposal facility.

During construction, treatment facilities will be established to treat various forms of wastewater. Temporary ablution facilities with a pump out arrangement are proposed for low occupancy areas.

MITIGATIONS MEASURES

Waste from the Project will be managed in a manner that seeks to prevent, avoid, re-use, and recycle Project related waste, with management measures implemented to ensure that the Project's generation and safe disposal of waste has a minimal impact on the surrounding environment.

A Construction Waste Management Plan (CWMP) will be prepared and implemented to ensure that waste is minimised and managed appropriately.

Want to know more?

See EIS chapters:

- Chapter 6: Assessment of Impacts
- Chapter 6.15: Waste
- Appendix Q: Rehabilitation

Cumulative Impacts

Cumulative impacts can be defined as the successive, incremental, and combined effect of multiple impacts, which may in themselves be minor, but could become significant when considered together.

A cumulative impact assessment has identified future development projects in the region that have potential to interact with the Project and reviewed available information pertaining to their environmental and social impacts.

The key matters that may be affected by cumulative impacts are traffic, and social and economic impacts within the broader region. Specifically, they relate to the required cumulative:

- construction workforce.
- operational workforce demand.
- employment benefits.
- population changes during construction.
- housing and short-term accommodation pressure.
- social infrastructure.

As an example, a standard assessment for traffic and transport was applied for projects that may use the same carriageway (Waterfall Way), it was determined that there is adequate carriageway capacity on the existing road network to accommodate cumulative traffic.



Open and ongoing engagement with landowners and local communities will ensure that cumulative impacts are identified early, communicated clearly, and mitigated.

A housing and accommodation strategy will also be prepared.

The cumulative impact assessment largely provides estimations due to a range of uncertainties including the level of detail available for future projects, the likelihood that those projects will proceed, the type and nature of infrastructure proposed, and the uncertainty of timing of future projects.

Want to know more?

See EIS chapters:

- **Chapter 6: Assessment of Impacts**
- **Chapter 6.16: Cumulative Impacts**

The Oven Mountain Project will play an integral part in the development of the New England Renewable Energy Zone, which includes the Armidale and Walcha regions (pictured).



EVALUATION AND CONCLUSION

The Oven Mountain Pumped Hydro Energy Storage Project will provide clean energy generation and 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. The classification of the Project as critical State significant infrastructure reflects this.

Changes to the NSW and Australian electricity system and market have rapidly created a need for large scale pumped hydro energy storage. As with many electricity markets around the world, the National Electricity Market is undergoing a significant transformation that has been brought about by 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.

The Project will help build power system resilience to unfavourable weather and market events by storing surplus renewable generation for use at times when solar and wind resources are scarce. The Project will contribute to 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.

Long-term benefits of the Project include:

- Creation of employment opportunities.
- Improved infrastructure and access.
- Contributions to scientific research and understanding.
- Provision of biodiversity offsetting of the Project's vegetation clearance to protect a much larger area than what is directly impacted.
- Creation of economic growth for the region.

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 many benefits of the Project and not satisfy this critical need.

To date, a number of impacts have been avoided and minimised through iterative design. This process will continue.

Through the implementation of proposed mitigation, management and offsetting measures, the EIS demonstrates that the Project could be undertaken without any significant long-term impacts on the local environment and community. As such, the Project is considered to be in the public interest.

To manage the potential impacts identified by the EIS, and in some cases remove them completely, the assessment chapters outline a range of mitigation measures that would be implemented during detailed design, construction, and operation of the Project.

Want to know more?

See EIS chapters:

- **Chapter 7: Evaluation**
- **Appendix E: Proposed Mitigation Measures**



The Oven Mountain team has been developing renewable energy projects since the mid-1990s and have more than 60 years of combined electricity generation development experience spanning hydro-electric, wind, solar and battery storage technologies.