Capricornia Energy Hub (CEH) Transmission Project

Application Number: **01950** Commencement Date: **01/08/2023** Status: **Locked**

1. About the project

1.1 Project details

1.1.1 Project title *

Capricornia Energy Hub (CEH) Transmission Project

1.1.2 Project industry type *

Energy Generation and Supply (renewable)

1.1.3 Project industry sub-type

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1.1.4 Estimated start date *

01/01/2026

1.1.4 Estimated end date *

31/12/2028

1.2 Proposed Action details

1.2.1 Provide an overview of the proposed action, including all proposed activities. *

Background

The Capricornia Energy Hub (CEH) Transmission Project (CEH Transmission Project) is a proposed transmission project located about 80km west of Mackay, Queensland. The project is located about 10km west of Eungella near the existing Eungella Dam (see Att. 1 Capricornia Energy Hub Transmission Project Ecological Significance of Impact Assessment MNES 2023 [CEH Transmission Project SIA 2023], Fig 1-1, pp 3). The CEH Transmission Project connects the CEH Pumped Hydroelectric Energy Storage (PHES) Project (CEH PHES Project) to the National Electricity Market by grid connection to the Nebo-Strathmore transmission line approximately 17km directly west of the CEH PHES Project.

Depending on operational requirements and market conditions, the CEH PHES Project will operate as a load or generator. A separate referral has been made for the 750MW pump/generation facility with a storage capacity of 12GWh (16hr) (EPBC Ref: 2023/09626), which will comprise two reservoirs: an upper reservoir with a valley in-fill wall, and an in-stream lower reservoir in the Broken River downstream and proximate to the existing Eungella Dam.

The CEH Transmission Project was part of a previous larger referral Ref:2020/8706 which was withdrawn on 10 January 2023.

The Proposed Action

The proposed action is the construction and operation of the CEH Transmission Project in the locality of Eungella Dam approximately 80km west of Mackay.

The project area is shown in Att. 1 (CEH Transmission Project SIA 2023), Fig 1-2, pp 4. Within the project area, a transmission study area has been identified to define land areas subject to detailed environmental surveys (see Att. 1 (CEH Transmission Project SIA 2023), Fig 2-1, pp 9).

The CEH Transmission Project includes the construction and operation of the following components:

1. A 275kV triple circuit overhead transmission line connecting the CEH PHES Project (EPBC Ref: 2023/09626) to the existing Powerlink 275kV Strathmore to Nebo transmission line (a direct line distance of about 17km);
2. A sub-station at the connection location to the Powerlink network to provide facilities for connection of the CEH Transmission Project to the grid;
3. Permanent access tracks;
4. Communications facilities; and
5. Temporary works such as access tracks and laydown areas.

The transmission line will require a 90m wide easement.

A final alignment for the transmission line has not yet been determined and the studies required to make a final determination are occurring within a transmission study area. Several routes have already been considered and discounted and refinement of routes is occurring in the remaining feasible areas (options 15 and 16 - see Att. 1 (CEH Transmission Project SIA 2023), Fig 1-3, pp5)). Att. 2 (Attachment 2 - Additional Maps - Fig 5) shows all routes considered.

The nature of activities that may give rise to significant impacts on matters of national environmental significance include:

1. Vegetation clearing (for electricity easement, tower pads, permanent or temporary access tracks, substation construction and laydown areas). Vegetation clearing can directly or indirectly impact habitat for species listed as endangered, threatened or vulnerable under the EPBC Act through habitat removal, fragmentation and barrier effects and the introduction of weed and pest species;
2. Excavation and earthworks. During construction, noise, vibration and dust emissions have the potential to directly and indirectly affect species listed under the EPBC Act in areas within and adjacent to the construction activities. Mobilisation of sediment from disturbed areas has the potential to affect aquatic habitats and species; and
3. Operations. Once constructed, cleared areas have the potential to harbour weed and pest species.

The entire project area is 10022.32 ha, however, only a maximum of 214.81 ha will be disturbed. There are two options for the transmission line route: options 15 and 16 (see Att. 1 (CEH Transmission Project SIA 2023), Fig 1-3, pp5 and section 2.1 of this referral that shows both options). Only one of the options will be selected for construction.

For the purposes of this referral, significant impact assessments have been based on the transmission option with the greatest impact on the relevant species or community. Once a final route is selected and further mitigation measures are applied, the disturbance areas will decrease, and the avoidance and retention areas can be confirmed.

The disturbance areas calculated in this referral are a worst case scenario as it assumes complete land clearance within the 90m transmission easement. As the routes are further refined and a final option selected, mitigation measures, such as raising lines to avoid species or communities, can be further considered and implemented in final design.

Transmission option 15 involves a maximum disturbance area of 214.81 ha comprising:

1. Transmission corridors and tower pads – 181.8 hectares of land disturbance (102.8 ha remnant, 69.7 non-remnant and 9.3 regrowth);
2. Access tracks – 18.1 hectares of land disturbance (14.1 ha remnant, 3.2 ha non-remnant and 0.8 ha regrowth); and
3. Sub-station – 14.91 hectares of land disturbance (3 ha remnant, 9.8 ha non-remnant and 2.2 ha regrowth).

Transmission option 16 involves a maximum disturbance area of 207.02 ha comprising:

1. Transmission corridors and tower pads – 176.31 hectares of land disturbance (105.66 ha remnant, 65.51 ha non-remnant and 9.12 ha regrowth);
2. Access tracks – 14.91 hectares of land disturbance (11.63 ha remnant, 3.35 ha non-remnant and 0.81 ha regrowth); and
3. Sub-station – 14.91 hectares of land disturbance (2.97 ha remnant, 9.8 ha non-remnant and 2.2 ha regrowth).

Following completion of the concept design for the transmission line and the application of further avoidance and mitigation measures, there will be clarity about the disturbance footprint (which is expected to decrease) and the avoidance and retention areas can be defined with greater certainty.

Investigation activities including surveys, environmental assessments, project design and geotechnical investigations are excluded from the scope of the activities the subject of this referral.

The CEH Transmission Project, together with the CEH PHES Project, are the subject of an application for a coordinated project under the Queensland *State Development and Public Works Organisation Act 1971* (lodged 28 July 2023). Should the State of Queensland decide that the project is a coordinated project for which an EIS is required, and the Minister determines that this project is a controlled action, the bilateral agreement between the Commonwealth and the State of Queensland under Section 45 of the *Environment Protection and Biodiversity Conservation Act 1999* relating to environmental assessment may apply.

1.2.2 Is the project action part of a staged development or related to other actions or proposals in the region?

Yes

1.2.3 Is the proposed action the first stage of a staged development (or a larger project)?

No

1.2.4 Related referral(s)

EPBC Number	Project Title
2020/8706	Bowen Renewable Energy Hub Pumped Hydro-electric Scheme

1.2.5 Provide information about the staged development (or relevant larger project).

The proposed action is related to another project, the CEH PHES Project (EPBC Ref: 2023/09626).

The CEH PHES Project is the construction, operation and decommissioning of a PHES, an approximately 750MW pump/generation facility with a storage capacity of 12GWh (16hr) and associated infrastructure located in Eungella Dam locality approximately 80km west of Mackay.

The CEH Transmission Project connects the CEH PHES Project to the Powerlink transmission network and the National Electricity Market.

The CEH PHES Project and the CEH Transmission Project are proposed by different corporate entities and, once in construction or operations, may have unrelated ownership structures. Separate referrals are being made to allow for flexibility for construction, timing, ownership and project financing.

The CEH Transmission Project and the CEH PHES Project (EPBC Ref 2023/09626) once formed part of a larger and now withdrawn project, the Bowen Renewable Energy Hub (BREH) (EPBC Ref 2020/8706). The BREH was a proposal to construct and operate two PHES operations in the Broken River catchment including power stations, dams and reservoirs, power transmission infrastructure, power generation infrastructure and all associated ancillary works and infrastructure.

Following completion of a pre-feasibility study and the introduction of a new owner and operator, the project was reduced, refined and redesigned.

The PHES reservoirs proposed in the CEH PHES Project (EPBC 2023/09626) are located in one of the option investigation areas of the withdrawn EPBC 2020/8706. The transmission options proposed as part of this referral (CEH Transmission Project – EPBC 2023/09627) are new route options not previously part of the withdrawn BREH (EPBC 2020/8706).

1.2.6 What Commonwealth or state legislation, planning frameworks or policy documents are relevant to the proposed action, and how are they relevant? *

The CEH Transmission Project is located in the Northern Queensland Renewable Energy Zone and the Australian Energy Market Operator(AEMO) Renewable Energy Zone Q4 (Isaac) and supports key energy policy areas identified by the Queensland Government, the Commonwealth Government and AEMO, including:

1. Providing a foundation project that will significantly contribute to Queensland Government's renewable energy target of 70% renewables generation by 2032, 80% by 2035, and net zero by 2050 (Queensland Energy and Jobs Plan, 2022);
2. Contributing toward the Commonwealth Government's commitment to 43% emissions reduction on 2005 emission levels by 2030 and net zero by 2050 targets (Climate Change Act 2022), and Australia's Paris Agreement commitments (Australian Government Climate Change commitments, policies and programs, Australian Office of Financial Management, 2022);
3. Renewable Energy (Electricity) Act 2000 (Commonwealth) establishes a scheme to encourage the development of power stations using renewable energy sources;
4. Contributing to the modernisation of Queensland's energy system by providing a large energy storage asset to firm Variable Renewable Energy (VRE) generation such as wind and solar;
5. Providing firming capacity to help address network stability issues associated with a higher input of renewable sources into the network;
6. Maximising transmission utilisation;
7. Diversification and growth of local and regional economies; and
8. Contributing to resilience from energy security and reduced dependence on fossil fuel energy for urban, industrial and agricultural purposes.

The proposed action is consistent with these climate change related legislation and policy objectives.

Other Commonwealth and state legislation and policy documents are relevant to enable the proposal, including but not limited to:

Commonwealth Legislation

1. EPBC Act (for impacts on matters of national environmental significance (MNES)).

Queensland Legislation

1. *State Development and Public Works Organisation Act 1971* (the proponent has applied to the Coordinator-General for a coordinated project declaration, to commence the EIS process under that Act);

2. *Planning Act 2016* (Qld) and its subordinate legislation for development approvals for:
    1. land use
    2. Waterway barrier works (with the *Fisheries Act 1994*)
    3. Clearing of native vegetation (with the *Vegetation Management Act 1999*)
    4. Development approvals for environmentally relevant activities;
3. *Nature Conservation Act 1992* (various permits for species and/or breeding places interference);
4. *Environmental Offsets Act 2014* (for environmental offsets);
5. *Electricity Act 1994* (for transmission authority); and
6. *Forestry Act 1959* (taking timber).

1.2.7 Describe any public consultation that has been, is being or will be undertaken regarding the project area, including with Indigenous stakeholders. Attach any completed consultation documentations, if relevant. *

A Community Consultation and Stakeholder Engagement Plan (CCSEP) has been developed and implemented for the CEH Transmission Project. The plan has been updated on a regular basis during the progression of the project from concept to preliminary and now into the environmental assessment process.

Stakeholder engagement was first undertaken with the landowners of the impacted properties and with the Widi Aboriginal Corporation Native Title holders and has been ongoing since 2019. Agreement for land access was reached with the landowners and an Indigenous Land Use Agreement (ILUA) was executed on 12 November 2022 with the Widi Aboriginal Corporation and registered with the National Native Title Tribunal on 7 March 2023. Engagement with the landowners and Widi people will be ongoing, and the terms listed in the ILUA will be completed at various stages of the CEH Transmission Project.

Consultation with stakeholders about the project commenced in 2019 with a small number of interested parties. As the CEH Transmission Project has evolved, an increasing number and range of local and regional stakeholders have been engaged.

At various times, such groups have included:

1. Landholders;
2. Traditional owners;
3. Local government;
4. Eungella community;
5. Relevant state government departments;
6. Relevant federal government departments;
7. Relevant state government owned corporations;
8. Relevant ancillary infrastructure providers;
9. Environmental interest groups;
10. Community interest groups;
11. Local and regional business and economic groups; and
12. Local, state and federal representatives for the region.

The objectives of engagement were to:

1. Meaningfully consider the interests and concerns of stakeholders who may be impacted (positively and negatively) by the CEH Transmission Project;
2. Provide opportunities for potentially impacted stakeholders to provide input to the social and environmental baseline;
3. Development of management strategies (including benefit enhancing opportunities); and
4. Inform the assessment and evaluation of impacts with the knowledge and experience of local stakeholders.

A Stakeholder Engagement and Communications Plan has been developed for the CEH Transmission Project and will continue to be refined over the life of the CEH Transmission Project. The current version of the plan is included as Attachment 3 – Community Consultation and Stakeholder Engagement Plan (CCSEP) (Att 3, CEH Transmission Project CCSEP).

A 1800 number, website, project information email address and social media channels have all been established and will remain active at least until the operational phase of the CEH Transmission Project.

1.3.1 Identity: Referring party

Privacy Notice:

Personal information means information or an opinion about an identified individual, or an individual who is reasonably identifiable.

By completing and submitting this form, you consent to the collection of all personal information contained in this form. If you are providing the personal information of other individuals in this form, please ensure you have their consent before doing so.

The Department of Climate Change, Energy, the Environment and Water (the department) collects your personal information (as defined by the Privacy Act 1988) through this platform for the purposes of enabling the department to consider your submission and contact you in relation to your submission. If you fail to provide some or all of the personal information requested on this platform (name and email address), the department will be unable to contact you to seek further information (if required) and subsequently may impact the consideration given to your submission.

Personal information may be disclosed to other Australian government agencies, persons or organisations where necessary for the above purposes, provided the disclosure is consistent with relevant laws, in particular the Privacy Act 1988 (Privacy Act). Your personal information will be used and stored in accordance with the Australian Privacy Principles.

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☑ **Confirm that you have read and understand this Privacy Notice ***

1.3.1.1 Is Referring party an organisation or business? *

Yes

Referring party organisation details

ABN/ACN	661700867
Organisation name	EUNGELLA INFRASTRUCTURE PTY LTD
Organisation address	3000 VIC

Referring party details

Name	Matthew Buchanan
Job title	General Manager Environment and Stakeholders
Phone	1800979686
Email	mbuchanan@repartners.com.au
Address	Level 6 200 Adelaide Street BRISBANE QLD 4000

1.3.2 Identity: Person proposing to take the action

1.3.2.1 Are the Person proposing to take the action details the same as the Referring party details? *

No

1.3.2.2 Is Person proposing to take the action an organisation or business? *

Yes

Person proposing to take the action organisation details

ABN/ACN	661700867

Organisation name	EUNGELLA INFRASTRUCTURE PTY LTD
Organisation address	3000 VIC

Person proposing to take the action details

Name	Sebastian Burgman
Job title	Project Director
Phone	1800979686
Email	sebu@cipprojects.dk
Address	Level 6, 200 Adelaide Street, BRISBANE, QLD, 4000

1.3.2.14 Are you proposing the action as part of a Joint Venture? *

No

1.3.2.15 Are you proposing the action as part of a Trust? *

No

1.3.2.17 Describe the Person proposing the action's history of responsible environmental management including details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against the Person proposing to take the action. *

Eungella Infrastructure Pty Ltd has a satisfactory record of responsible environment management.

Eungella Infrastructure Pty Ltd does not have a history of proceedings under Commonwealth, State or Territory Law for the protection of environment or the conservation and sustainable use of natural resources.

1.3.2.18 If the person proposing to take the action is a corporation, provide details of the corporation's environmental policy and planning framework

The person proposing to take the action (Eungella Infrastructure Pty Ltd) is a special purpose vehicle established to deliver the project. Environmental policy and planning framework documentation is not yet available for the project.

1.3.3 Identity: Proposed designated proponent

1.3.3.1 Are the Proposed designated proponent details the same as the Person proposing to take the action? *

No

1.3.3.2 Is Proposed designated proponent an organisation or business? *

Yes

Proposed designated proponent organisation details

ABN/ACN	18637681737
Organisation name	BLUE POWER PARTNERS PTY LTD
Organisation address	3000 VIC

Proposed designated proponent details

Name	Haidar Etemadi
Job title	Senior Planner
Phone	1800979686
Email	het@bluepp.dk
Address	Level 35, 477 Collins Street MELBOURNE VIC 3000

1.3.4 Identity: Summary of allocation

Confirmed Referring party's identity

The Referring party is the person preparing the information in this referral.

ABN/ACN	661700867
Organisation name	EUNGELLA INFRASTRUCTURE PTY LTD
Organisation address	3000 VIC
Representative's name	Matthew Buchanan
Representative's job title	General Manager Environment and Stakeholders
Phone	1800979686
Email	mbuchanan@repartners.com.au

Address	Level 6 200 Adelaide Street BRISBANE QLD 4000

Confirmed Person proposing to take the action's identity

The Person proposing to take the action is the individual, business, government agency or trustee that will be responsible for the proposed action.

ABN/ACN	661700867
Organisation name	EUNGELLA INFRASTRUCTURE PTY LTD
Organisation address	3000 VIC
Representative's name	Sebastian Burgman
Representative's job title	Project Director
Phone	1800979686
Email	sebu@cipprojects.dk
Address	Level 6, 200 Adelaide Street, BRISBANE, QLD, 4000

Confirmed Proposed designated proponent's identity

The Person proposing to take the action is the individual or organisation proposed to be responsible for meeting the requirements of the EPBC Act during the assessment process, if the Minister decides that this project is a controlled action.

ABN/ACN	18637681737
Organisation name	BLUE POWER PARTNERS PTY LTD
Organisation address	3000 VIC
Representative's name	Haidar Etemadi
Representative's job title	Senior Planner
Phone	1800979686
Email	het@bluepp.dk
Address	Level 35, 477 Collins Street MELBOURNE VIC 3000

1.4 Payment details: Payment exemption and fee waiver

1.4.1 Do you qualify for an exemption from fees under EPBC Regulation 5.23 (1) (a)? *

No

1.4.3 Have you applied for or been granted a waiver for full or partial fees under Regulation 5.21A? *

No

1.4.5 Are you going to apply for a waiver of full or partial fees under EPBC Regulation 5.21A?

No

1.4.7 Has the department issued you with a credit note? *

No

1.4.9 Would you like to add a purchase order number to your invoice? *

No

1.4 Payment details: Payment allocation

1.4.11 Who would you like to allocate as the entity responsible for payment? *

Third party

1.4.12 Is the third party an organisation? *

Yes

1.4.13 Do they have an existing ABN or ACN? *

Yes

1.4.14 ABN/ACN *

82616492392

1.4.16 Organisation name *

ORTUM PTY. LTD.

1.4.17 Organisation's primary address *

Level 6, 200 Adelaide Street, BRISBANE, QLD, 4000

1.4.18 First name *

Sebastian

1.4.19 Last name *

Burgman

1.4.20 Job title *

Project Director

1.4.21 Phone *

1800979686

1.4.22 Email *

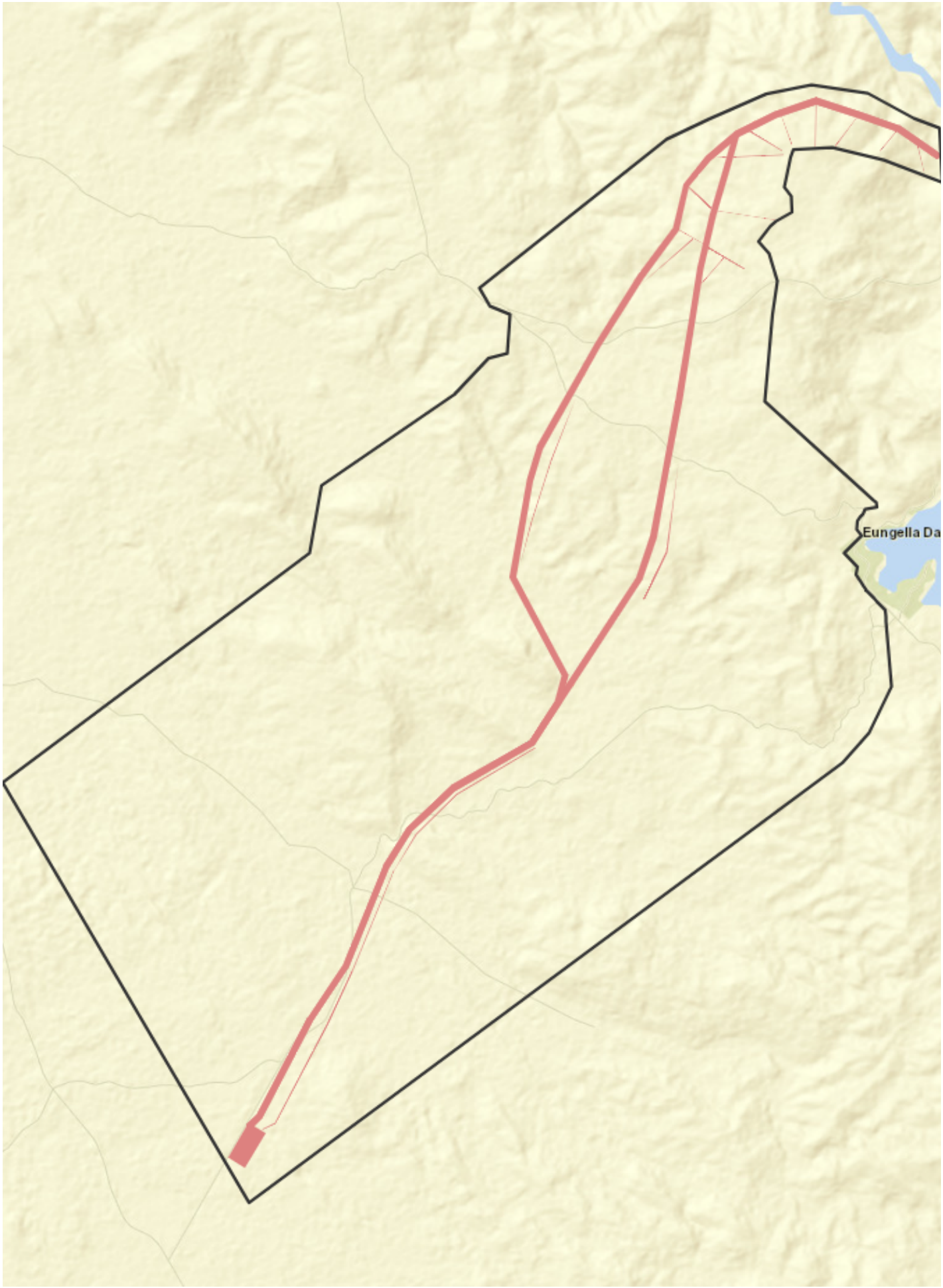
sebu@cipprojects.dk

1.4.23 Address *

Level 6, 200 Adelaide Street, BRISBANE, QLD, 4000

2. Location

2.1 Project footprint


Eungella Da

2.2 Footprint details

2.2.1 What is the address of the proposed action? *

Lizzie Creek Road, Turrawulla 4742.

2.2.2 Where is the primary jurisdiction of the proposed action? *

Queensland

2.2.3 Is there a secondary jurisdiction for this proposed action? *

No

2.2.5 What is the tenure of the action area relevant to the project area? *

The project area includes the following land parcels (see also Att. 2 (Additional Maps), Figure 2 Land Tenure):

Lot 2 on SP104779 (Turrawulla Station)(leasehold);

Lot 100 on SP239828 (Eungella Station)(freehold);

Lot 112 on SP239828 (Eungella Station)(leasehold);

Lot 110 on SP334138 (Eungella Station)(leasehold);

Various road reserves including Lizzie Creek Road, Mount Barker Road, Eungella Dam Road, Bee Creek Road and unnamed road reserves; and

Water and electricity easements (44 easements covering approximately 196ha).

3. Existing environment

3.1 Physical description

3.1.1 Describe the current condition of the project area's environment.

The project is located approximately 80km west of Mackay, Queensland and about 10km west of Eungella near the Eungella Dam (See Att. 1 (CEH Transmission Project SIA 2023), Fig 1-1, pp 3).

Historically, the land within the proposed action project area has been subject to low intensity cattle grazing, though much of the area retains various degrees of ecological value. The project area includes a deep valley in the Eungella hinterland, immediately west of the Clarke Range. The upper slopes have steep, rocky terrain, vegetated with open woodland. These areas contain rock outcrops, caves and ledges. Lower slopes occur on undulating terrain with open woodland with sheltered gorges containing patches of dry rainforest.

Lower alluvial flats contain mature woodland and open woodland, typically with a weedy understorey dominated by lantana.

The landscape has been impacted by decades of alteration from low intensity cattle grazing, vegetation clearing and intrusion by invasive weeds. These processes have affected local ecosystem composition and processes, reducing in places the density of native vegetation including eucalypts. While much of the project area has previously been cleared for grazing, the majority of the project area contains remnant vegetation in varying ecological condition.

Att. 1 (CEH Transmission Project SIA 2023), Fig 3-1, pp 19 details the regional ecosystem mapping for the study area. Substantial areas of the central and western study areas are non-remnant vegetation (predominantly pastures grasses), are actively grazed and have limited ecological value.

The western areas of the study area have a higher diversity of vegetation types and ecological communities (including Poplar Box woodlands on alluvial plains). Quality of these ecological communities is variable, with some examples of high quality woodlands, fragmentation due to infrastructure corridors and cleared areas for grazing and areas of infestation of *Lantana camara*.

Northern areas of the study area are typified by communities dominated by Eucalyptus, Corymbia and Lophostemon. Condition of these communities range from good to poor, with clearing for grazing and infestation of weeds and pests being the main features of degradation. Observed weed species include harrisia cactus (*Harrisia martini*), lantana (*Lantana camara)*, velvety tree pear (*Opuntia tomentosa),* parthenium *(Parthenium hysterophorus) and* rat's tail grass *(Sporobolus natalensis).*

Pest mammals recorded included rusa deer (*Cervus timoriensis)*, European rabbit (*Oryctolagus cuniculus)*, feral pig (*Sus scrofa)*, wild dog (*Canis familiaris),* and brumby (*Equus caballus)*. An additional two species (European fox (Vulpes *vulpes)* and chital deer (*Axis axis))* were not documented during field surveys but are known to occur in the region and are considered likely to be present. Cane toad (*Rhinella marina)* is prevalent.

Patches of semi-evergreen vine thicket in good condition occur in central parts of the study area.

Refer to Att. 1 (CEH Transmission Project SIA 2023), Chapter 3, pp 15-18 for detailed descriptions of the results of flora and fauna surveys and mapping.

The project area occurs across two local government areas (Isaac Regional Council and Mackay Regional Council). Properties in the project area within the Isaac Regional Council local government area are zoned rural. Properties in the project area within the Mackay Regional Council local government area are zoned open space or rural. The project will not require re-zoning of lands.

Most properties adjacent to the project area are continuations of the same large rural landholdings that are involved in the project area. Where adjacent properties are not involved in the project area, they are zoned rural (Isaac Regional) or open space or rural (Mackay Regional). There are reserve lands (zoned rural) associated with the Eungella Dam adjacent and to the east of the project area.

Access routes to the project area using existing road infrastructure are currently the subject of route selection studies and also in part by a transport impact assessment. Access to the project area will likely be from Nebo and Turrawulla from the west (Suttor Developmental Road and Turrawulla Road). The nature and extent of upgrade requirements are currently being investigated.

Within the project area, existing road infrastructure will be utilised wherever possible and upgraded as required. This will include Bee Creek Road and Mount Barker Road. Transportation studies and route selection studies are assessing the suitability of Lizzie Creek Road and Barker Road. New access tracks will be required within the project area to access transmission tower locations.

3.1.2 Describe any existing or proposed uses for the project area.

Lands in the project area are mostly utilised for grazing (with the exception of roads and infrastructure easements). There are no dwellings in the project area.

The intended land use will not change substantively, except in the areas directly utilised for the transmission towers, substation and permanent access tracks.

In relation to existing land use, the project area:

1. Includes 3 mining tenures and 0 petroleum tenures (see Att. 2 (Additional Maps), Fig 1, Mining and Petroleum Tenure):
    - Exploration Permit (Minerals) application 28203;
    - Exploration Permit (Minerals) granted 27635;
    - Mining Lease (Minerals) granted ML100294.
2. Does not intersect any existing rail infrastructure;
3. Does not intersect any power transmission infrastructure (other than at the connection point - see Att. 2 (Additional Maps), Fig 1, Mining and Petroleum Tenure);
4. Depending on the final route selected, the transmission line may intersect various local roads, watercourses or water easements (Att. 2 (Additional Maps), Fig 2, Land Tenure).

Land parcels within the Mackay Regional Council are zoned open space. In the affected land parcels in Isaac Regional Council, their zoning is rural.

Other than potential mining exploration and the proposals associated with this CEH Transmission Project, there are no other known proposed uses for the land parcels the subject of the project area.

3.1.3 Describe any outstanding natural features and/or any other important or unique values that applies to the project area.

The proposed action does not intersect any protected reserve areas but is located approximately 3km northwest of the Crediton Forest Reserve and approximately 9km west of the Eungella National Park, both protected under the *Nature Conservation Act 1992* (See Att. 1 (CEH Transmission Project SIA 2023), Fig 1-1, pp 3).

The project area is located in a region that is characterised by being sparsely populated with large rural properties and minimal built environment characteristics. The area has a mix of landscape features including valleys and escarpments, grasslands and woodlands with all areas being utilised for improved and unimproved cattle grazing.

3.1.4 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area.

The project area is located in areas with high variability of elevation due to the mountainous nature of the region, ranging in elevation from approximately 300m AHD to 820m AHD.

The northern end of the transmission study area is located on the high country west of the Broken River and sits within a wide undulating valley. Slopes comprise grassy undulating terrain with small gullies, a flattish valley floor and sparse trees. Slopes are around 15°.

To the west of the project area, the ridgelines and plateaus step down to grassland plains with prominent interspersed hills and mountains.

Contours of the project area are shown in Att. 1 (CEH Transmission Project SIA 2023), Fig 1-2, pp 4.

3.2 Flora and fauna

3.2.1 Describe the flora and fauna within the affected area and attach any investigations of surveys if applicable.

Considerable flora and fauna field survey effort has been conducted within the project area and in the broader area since 2020 (see Att. 1 (CEH Transmission Project SIA 2023), Fig 2-1, pp 9). For flora, this has included regional ecosystem verification and mapping (Att. 1 (CEH Transmission Project SIA 2023), Fig 3-1, pp 17), threatened ecological community assessments, recording of invasive species and targeted searches for conservation significant flora.

Terrestrial fauna surveys have included habitat assessment, targeted searches for conservation significant fauna (or traces of), SPOT assessments, bird census, reptile and frog searches, camera and anabat detector deployment, nocturnal active searches and spotlighting, driving / flushing surveys and Bio-Condition assessments.

Aquatic fauna surveys have included active searches and habitat assessment for freshwater fish, turtles, platypus and crocodiles. Aquatic flora and macroinvertebrates were recorded at each site.

The PMST search tool protected matters report (19 April 2023)(Att. 1 (CEH Transmission Project SIA 2023), Appendix A) indicated that there may be the presence of:

1. 4 threatened ecological communities,
2. 27 threatened species, and
3. 15 migratory species.

As a result of field surveys to date and an assessment of likelihood of occurrence (Att. 1 (CEH Transmission Project SIA 2023), Appendix B), the results confirm the presence or the moderate to high likelihood of the presence of:

1. 1 threatened ecological community (Poplar box grassy woodland on alluvial plains);
2. 8 threatened species (Black ironbox *(Eucalyptus raveretiana*), Granite nightshade (*Solanum graniticum*), Greater glider (southern and central) (*Petauroides volans*), Grey-headed flying-fox (*Pteropus poliocephalus*), Koala (*Phascolarctos cinereus*), Northern quoll (*Dasyurus hallucatus*), Yellow-bellied glider (south-eastern) (*Petaurus australis australis*), Squatter pigeon (southern) (*Geophaps scripta scripta*), and (White-throated needletail (*Hirundapus caudacutus*)); and
3. 6 migratory species (White-throated needletail (*Hirundapus caudacutus*), Fork-tailed swift (*Apus pacificus*), Black-faced monarch (*Monarcha melanopsis*), Satin flycatcher (*Myiagra cyanoleuca*), Rufous fantail (*Rhipidura rufifrons*), and Spectacled monarch (*Symposiachrus trivirgatus*)).

Results of field surveys are included in Att. 1 (CEH Transmission Project SIA 2023), Chapter 3, pp 15-19.

In addition to the threatened species detailed above, field surveys recorded a range of non—threatened and common native and introduced species.

Across the study area, vegetation communities are dominated by eucalyptus, corymbia and lophostemon, with occurrences of melaleuca, acacia and casuarina.

Amphibians recorded within the study area included broad-palmed rocket frog, *Limnodynastes terraereginae* (scarlet-sided pobblebonk), ornate burrowing frog, stony creek frog, *Pseudophryne major* (major broodfrog) and the cane toad.

Commonly recorded reptiles included *Carlia vivax* (tussock litter skink), *Gehyra dubia* (dubious dtella), *Heteronotia binoei* (Bynoe's gecko), Tommy roundhead, lace monitor and eastern water dragon.

Macropods were not widely recorded, however *Wallabia bicolor (*swamp wallaby) was observed in the northern areas. *Petrogale inornata* (unadorned rock-wallaby) was recorded in steep rocky outcrops in northern areas of the study area. Evidence of arboreal mammals including *Trichosurus vulpecula (*common brushtail possum) and *Pseudocheirus peregrineus* (common ringtail possum) were recorded at low densities.

The diversity and relative abundance of birds was highest in woodland remnants. These areas provide habitat for a range of birds including honeyeaters, treecreepers, thornbills, lorikeets, fantails, gerygones, cuckoos and wrens. Open woodland and cleared areas supported a range of birds adapted to open landscapes including rosellas, lorikeets, butcherbirds, magpies, crows, friarbirds and currawongs.

3.2.2 Describe the vegetation (including the status of native vegetation and soil) within the project area.

The Brigalow Belt bioregion stretches from Townsville in the north to the NSW border in the south and separates Queensland's wet tropical rainforests from the temperate forests of southeast Queensland. The bioregion contains 56,496km2 of mixed landscapes, including undulating hills, low ridges and rises, deep valleys and flat alluvial plains. Floristically, it is characterised by the natural overstorey dominance of *Acacia harpophylla* (silver foliage wattle brigalow), however it also supports mixed eucalypt woodlands, softwood scrubs and open Astrebla and Dichanthium grasslands. The majority of the bioregion has been cleared for cropping and agricultural purposes with current estimates that 87 percent of the bioregion's remnant vegetation has been cleared.

The Brigalow Belt bioregion is comprised of 38 subregions. The proposed action is contained within the Bogie Hills subregion of the Brigalow Belt bioregion.

The project area is dominated by remnant vegetation with some areas cleared for agricultural purposes. For each current preferred option, approximately 35% of the transmission corridor is within land previously cleared for agriculture and not containing high value regrowth. Remaining remnant vegetation has been mapped as shown in Att. 1 (CEH Transmission Project SIA 2023), Fig 3-1, pp 16 and described in detail in Att. 1 (CEH Transmission Project SIA 2023), section 3.2, pp15 and in section 3.1.1 of this referral.

The western areas of the study area have a higher diversity of vegetation types and ecological communities (including Poplar Box woodlands on alluvial plains). Quality of these ecological communities is variable, with some examples of high quality woodlands, fragmentation due to infrastructure corridors and cleared areas for grazing and areas of infestation of *Lantana camara*.

Substantial areas of the central and western study areas are non-remnant vegetation (predominantly pastures grasses), are actively grazed and have limited ecological value.

Northern areas of the study area are typified by communities dominated by Eucalyptus, Corymbia and Lophostemon. Condition of these communities range from good to poor, with clearing for grazing and infestation of weeds and pests being the main features of degradation.

All vegetation in the project area is subjected to periodic bushfires and burning as part of grazing practices. The project area includes bushfire prone and bushfire hazard areas.

Soils in the project area are dominated by sodosols. These soils have high sodicity leading to high erodibility, poor structure and low permeability.

3.3 Heritage

3.3.1 Describe any Commonwealth heritage places overseas or other places recognised as having heritage values that apply to the project area.

There are no noted areas of Commonwealth heritage significance in the project area.

3.3.2 Describe any Indigenous heritage values that apply to the project area.

Several site walkovers were undertaken with the Widi people prior to the execution of the ILUA (Native Title boundaries are shown in Att. 2 (Additional Maps), Figure 3). No artefacts or any signs of indigenous cultural heritage were found at that time.

A cultural heritage management agreement is in place to allow for surveys associated with the project. The cultural heritage management agreement has been attached to this referral but is being withheld from publication due to cultural sensitivities. One survey adjacent to the project area in 2022 found light scatterings of artefacts which were recorded and relocated.

3.4 Hydrology

3.4.1 Describe the hydrology characteristics that apply to the project area and attach any hydrological investigations or surveys if applicable. *

The proposed action is located within the Burdekin Basin in Central Queensland. The Burdekin Basin is the second-largest river basin in Australia covering an area of ~134,000km2 with a mean annual discharge to the Great Barrier Reef of 8,327,681ML (NQ Dry Tropics 2016). The waterways in the basin vary from largely sandy, dry ephemeral creek systems to permanently flowing clear-water rivers and creeks originating in mountain rainforest. The Burdekin Basin contains a range of environmental values including groundwater dependent ecosystems, surface water, freshwater rivers, creeks and streams, wetlands, estuaries, coastal and marine systems (NQ Dry Tropics 2016).

The Burdekin Basin comprises four major sub-basins:

1. Upper Burdekin 36,244.7km²;
2. Suttor 73,935.8km²;
3. Bowen 9,451.6km²; and
4. Lower Burdekin 10,477.4km².

The project area occurs entirely within the Bowen River sub-catchment (see Att. 2 (Additional Maps), Figure 4, Drainage Basins). This sub-catchment covers approximately nine percent of the Burdekin Basin and includes Bogie River; Bowen River; Broken River; Glenmore Creek; Little Bowen River; Pelican Creek; and Rosella Creek (NQ Dry Tropics 2016).

The majority of the larger Burdekin catchment is classified as a hot semi-arid climate (‘BSh’) under the Koppen-Geiger classification scheme, however the inter and intra-annual rainfall and flood variability is more pronounced than for other semi-arid climates across the globe (Petheram et al., 2008). Temperatures range on average between 23°C and 35°C in December and between 11°C and 24°C in July. High rainfall typically occurs during the wet season between November and March where tropical cyclones and flooding are prominent. Consequently, high stream flows typically occur between February and March following large rainfall events. Seasonal flow analysis of 114 years of historical daily flow data from 1890 to 2004, identified that the annual flow within the Broken River, as measured at Node 453, ranges from a minimum of 0m3/s to a max of 19,704m3/s, with a mean flow of 39.5m3/s across the 114 years of flow data.

According to the Water Monitoring Data Portal (Queensland Government Department of Natural Resources, Mines and Energy, 2020), a number of stream gauge stations have existed, or still exist, in the Bowen River Basin. 24 daily rainfall data stations and five pluviometric data stations are distributed across the Bowen River catchment.

In the transmission project area, possible route options involve crossing several low order unnamed tributaries (approximately 17 per option), two high order and one major stream (Hazlewood Creek).

4. Impacts and mitigation

4.1 Impact details

Potential Matters of National Environmental Significance (MNES) relevant to your proposed action area.

EPBC Act section	Controlling provision	Impacted	Reviewed
S12	World Heritage	No	Yes
S15B	National Heritage	No	Yes
S16	Ramsar Wetland	No	Yes
S18	Threatened Species and Ecological Communities	Yes	Yes
S20	Migratory Species	Yes	Yes
S21	Nuclear	No	Yes
S23	Commonwealth Marine Area	No	Yes
S24B	Great Barrier Reef	No	Yes
S24D	Water resource in relation to large coal mining development or coal seam gas	No	Yes
S26	Commonwealth Land	No	Yes
S27B	Commonwealth Heritage Places Overseas	No	Yes
S28	Commonwealth or Commonwealth Agency	No	Yes

4.1.1 World Heritage

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

—

4.1.1.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.1.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

There are no listed World Heritage Properties located within the project area or within the 10km buffer applied to the Protected Matters Search Tool (see Att 1, Appendix A).

4.1.2 National Heritage

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.2.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.2.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

There are no listed National Heritage Places located within the project area or within the 10km buffer applied to the Protected Matters Search Tool (see Att. 1, Appendix A).

4.1.3 Ramsar Wetland

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.3.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.3.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

There are no listed Wetlands of International Importance (Ramsar) located within or near the project area or within the 10km buffer applied to the Protected Matters Search Tool (see Att. 1, Appendix A).

4.1.4 Threatened Species and Ecological Communities

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

Threatened species

Direct impact	Indirect impact	Species
No	No	Arthraxon hispidus
No	No	Calidris ferruginea

Direct impact	Indirect impact	Species
Yes	Yes	Dasyurus hallucatus
No	No	Denisonia maculata
No	No	Dichanthium queenslandicum
No	No	Dichanthium setosum
No	No	Egernia rugosa
No	No	Erythrotriorchis radiatus
Yes	Yes	Eucalyptus raveretiana
No	No	Falco hypoleucos
Yes	Yes	Geophaps scripta scripta
Yes	Yes	Hirundapus caudacutus
No	No	Macroderma gigas
No	No	Neochmia ruficauda ruficauda
No	No	Numenius madagascariensis
No	No	Omphalea celata
No	No	Ozothamnus eriocephalus
Yes	Yes	Petauroides volans
Yes	Yes	Petaurus australis australis
Yes	Yes	Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)
No	No	Phlegmariurus tetrastichoides
No	No	Poephila cincta cincta
Yes	Yes	Pteropus poliocephalus
No	No	Rostratula australis
No	No	Samadera bidwillii
Yes	Yes	Solanum graniticum
No	No	Taudactylus eungellensis
No	No	Tyto novaehollandiae kimberli

Ecological communities

Direct impact	Indirect impact	Ecological community
No	No	Brigalow (Acacia harpophylla dominant and co-dominant)
No	No	Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin
Yes	Yes	Poplar Box Grassy Woodland on Alluvial Plains
No	No	Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions

4.1.4.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

Yes

4.1.4.2 Briefly describe why your action has a direct and/or indirect impact on these protected matters. *

Threatened Species – Flora

There will likely be direct impacts on *Eucalyptus raveretiana* (Black ironbox) and *Solanum graniticum* (Granite nightshade) associated with direct clearing of individuals (or suitable habitat) where they occur within the final project footprint. Both species are confirmed to exist within the project area. See Att. 1 (CEH Transmission Project SIA 2023), Figures 5-2 and 5-3 pp 27 and 31 respectively.

Eucalyptus raveretiana (Black ironbox) occurs in discrete areas associated with watercourses at the western end of the transmission corridor (see Att. 1 (CEH Transmission Project SIA 2023), Figures 5-2, pp 27). Up to 5.18 hectares of habitat that support the occurrence of *Eucalyptus raveretiana* (Black ironbox) may be cleared (pre avoidance and mitigation) and other potential direct impacts include minor habitat degradation by dust, runoff and sedimentation and the introduction and spread of weeds. Option 15 has the greatest impact on *Eucalyptus raveretiana* (Black ironbox) with disturbance of 5.18 hectares (option 16 is 5.05 ha).

Solanum graniticum (Granite nightshade) has a locally patchy distribution associated with regional ecosystems 11.12.1 *Eucalyptus crebra* woodland on igneous rocks, 11.12.6a *Eucalyptus crebra +/- Corymbia citriodora* and/or *E. acmenoides +/- Lophostemon suaveolens* woodland to open forest and 11.12.7 *Eucalyptus crebra* woodland with patches of semi-evergreen vine thicket on igneous rocks (boulder strewn hillsides)(See Att. 1 (CEH Transmission Project SIA 2023), Figure 5-3 pp 31). Potential impacts on *Solanum graniticum* (Granite nightshade) include loss of 14.49 hectares of suitable habitat and the introduction and spread of weeds. Option 15 has the greatest impact on *Solanum graniticum (Granite nightshade)* with disturbance of 14.49 hectares (option 16 is 10.45 ha).

Indirect impacts may arise where these species are present within the project area but not within the final project footprint. These indirect impacts may include dust, habitat degradation through sedimentation, introduction of weeds and / or pests, and fragmentation and barrier effects.

Att. 1 (CEH Transmission Project SIA 2023), Table 3-2, pp18 details the results of surveys where both species have been recorded as present.

Threatened Species - Fauna

There may be direct impacts on the following threatened fauna species associated with construction of the CEH Transmission Project (including transmission line, sub-station and access tracks). Impacts are assessed on the basis of the transmission line option with the greatest impact:

Petauroides volans (Greater glider) - Att. 1 (CEH Transmission Project SIA 2023), Figure 5-4, pp35, Att. 1 (CEH Transmission Project SIA 2023), Table 3-2, pp 18. Potential impacts on *Petauroides volans* (Greater glider) populations and habitat within the CEH Transmission Project include:

- Loss of 77.53 ha of habitat critical to the survival of the species associated with option 15 (76.40 ha for option 16);
- Disturbance to wildlife through increased light, noise and vibration;
- Habitat degradation by increased dust run-off and sedimentation;
- Introduction and spread of pest fauna species and weeds; and/or
- Fragmentation and barrier effects.

Pteropus poliocephalus (Grey-headed flying fox) – Att. 1 (CEH Transmission Project SIA 2023), Figure 5-5, pp 39, Att. 1 (CEH Transmission Project SIA 2023), Table 3-2, pp18. Potential impacts on *Pteropus poliocephalus* (Grey-headed flying fox) and the species' habitat arising from construction of the CEH Transmission Project include:

- Loss of 115.26 ha of habitat critical to the survival of the species associated with option 16 (114.24 ha for option 15);
- Loss of 42.61 ha of general foraging habitat associated with option 16 (46.66 ha for option 15);
- Disturbance to wildlife through increased light, noise and vibration; and/or
- Habitat degradation by increased dust, run-off and sedimentation.

Phascolarctos cinereus (Koala) – Att. 1 (CEH Transmission Project SIA 2023), Figure 5-6, pp 43, Att. 1 (CEH Transmission Project SIA 2023), Table 3-2, pp18. Potential impacts on *Phascolarctos cinereus* (Koala) habitat arising from the CEH Transmission Project include:

- Loss of 119.35 ha of habitat critical to the survival of the koala associated with option 16 (118.52 ha for option 15);
- Loss of 37.74 ha of foraging habitat associated with option 16 (41.85 ha for option 15);
- Barrier effects and restriction of koala movement;
- Injury and mortality;
- Habitat degradation by increased dust run-off and sedimentation; and/or
- Introduction and spread of invasive weeds and pests.

Dasyurus hallucatus (Northern quoll) – Att. 1 (CEH Transmission Project SIA 2023), Figure 5-7, pp 49, Att. 1 (CEH Transmission Project SIA 2023), Table 3-2, pp18. The construction of the CEH Transmission Project has the potential to result in the following impacts on *Dasyurus hallucatus* (Northern quoll):

- Loss of 132.37 ha of habitat critical to the survival of the species associated with option 16 (132.15 ha for option 15) ;
  - 128.7 ha of foraging habitat associated with option 16 (129.99 ha for option 15);
  - 3.67 ha of denning habitat associated with option 16 (2.16 ha for option 15).
- Injury and mortality;
- Habitat degradation by increased dust run-off and sedimentation;
- Introduction and spread of pest fauna species and weeds; and/or
- Fragmentation and barrier effects.

Geophaps scripta scripta (Squatter pigeon (southern)) – Att. 1 (CEH Transmission Project SIA 2023), Figure 5-8, pp 53, Att. 1 (CEH Transmission Project SIA 2023), Table 3-2, pp18. Construction of the CEH Transmission Project has the potential to result in the following impacts on *Geophaps scripta scripta* (Squatter pigeon (southern)):

- Loss of 14.33 ha of habitat critical to the survival of the species (nesting habitat) associated with option 15 (3.26 ha for option 16);
  - 77.33 ha of foraging habitat associated with option 15 (90.02 ha for option 16);
  - 15.78 ha of drinking habitat associated with option 15 (10.46 ha for option 16).
- Injury and mortality;
- Disturbance from increased light, noise, and vibration;
- Habitat degradation through increased dust, run-off, and sedimentation; and
- Introduction and spread of invasive fauna species and weeds.

Petaurus australis australis (Yellow-bellied glider (south-eastern)) – Att. 1 (CEH Transmission Project SIA 2023), Figure 5-9, pp 58, Att. 1 (CEH Transmission Project SIA 2023), Table 3-2, pp18. Potential impacts on *Petaurus australis australis* (Yellow-bellied glider (south-eastern)) population and habitat within CEH Transmission Project include:

- Loss of 39.59 ha of habitat critical to the survival of the species associated with option 15 (33.73 ha for option 16);
- Disturbance to wildlife through increased light, noise and vibration;
- Habitat degradation by increased dust run-off and sedimentation;
- Introduction and spread of pest fauna species and weeds; and / or
- Fragmentation and barrier effects.

*Hirundapus caudacutus (*White-throated needletail) – Att. 1 (CEH Transmission Project SIA 2023), Figure 5-10, pp 62, Att. 1 (CEH Transmission Project SIA 2023), Table 3-2 pp18. Potential impacts on *Hirundapus caudacutus (*White-throated needletail) populations include:

- Loss of 1.11 ha habitat critical to the survival of the species (roosting) associated with option 16 (1.10 ha for option 15); and
- Loss of 131.26 ha of overfly habitat associated with option 16 (131.08 ha for option 15).

Indirect impacts may occur through light, noise, dust and vibration, habitat degradation through sedimentation, introduction of weeds and / or pests, and fragmentation and barrier effects.

Threatened Ecological Community – Poplar Box Grassy Woodland on Alluvial Plains

There will likely be direct impacts on the Poplar Box Grassy Woodland on Alluvial Plains TEC associated with direct clearing of the TEC where it may intersect the final project footprint. See Att. 1 (CEH Transmission Project SIA 2023), Figure 5-1, pp 23. The impact is the same for both transmission options.

Indirect impacts may arise where the TEC is present within the project area but not within the final project footprint. These indirect impacts may include dust, habitat degradation through sedimentation, introduction of weeds and / or pests, and fragmentation and barrier effects.

4.1.4.4 Do you consider this likely direct and/or indirect impact to be a Significant Impact? *

Yes

4.1.4.5 Describe why you consider this to be a Significant Impact. *

Greater glider (southern and central) (*Petauroides volans*)

A significance of impact assessment is provided in Att. 1 (CEH Transmission Project SIA 2023), section 5.4, pp 32 and is summarised below.

Habitats within the project area would be considered habitat critical to the survival of the species based on the extent of contiguous woodland with mature hollow-bearing trees and a diverse range of preferred food species for the region.

Potential residual impacts on greater glider populations and habitat within the CEH Transmission Project include:

1. Loss of 77.53 ha of habitat critical to the survival of the species;
2. Disturbance to wildlife through increased light, noise and vibration;
3. Habitat degradation by increased dust run-off and sedimentation;
4. Introduction and spread of pest fauna species and weeds; and
5. Fragmentation and barrier effects.

Of the significant impact criteria relevant to *Petauroides volans,* it was assessed that it is ***likely*** that the CEH Transmission Project will adversely affect habitat critical to the survival of the species.

Grey-headed flying-fox (*Pteropus poliocephalus*)

A significance of impact assessment is provided in Att. 1 (CEH Transmission Project SIA 2023), section 5.5, pp 36 and is summarised below:

Residual impacts on grey-headed flying-fox and the species' habitat arising from the CEH Transmission Project include:

1. Loss of 115.26 ha of habitat critical to the survival of the species;
2. Loss of 42.61 ha of general foraging habitat;
3. Disturbance to wildlife through increased light, noise and vibration; and
4. Habitat degradation by increased dust, run-off and sedimentation.

Of the significant impact criteria relevant to *Pteropus poliocephalus,* it was assessed that it is:

1. ***likely*** that the CEH Transmission Project will adversely affect habitat critical to the survival of the species; and
2. ***possible*** that the CEH Transmission Project will modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

Koala (*Phascolarctos cinereus*)

A significance of impact assessment is provided in Att. 1 (CEH Transmission Project SIA 2023), section 5.6, pp 40 and is summarised below.

Potential residual impacts on koala habitat arising from the CEH Transmission Project include:

1. Loss of 119.35 ha of habitat critical to the survival of the koala;
2. Loss of 37.74 ha of foraging habitat;
3. Barrier effects and restriction of koala movement;
4. Injury and mortality;
5. Habitat degradation by increased dust run-off and sedimentation; and
6. Introduction and spread of invasive weeds and pests.

Of the significant impact criteria relevant to *Phascolarctos cinereus,* it was assessed that it is:

1. ***likely*** that the CEH Transmission Project will adversely affect habitat critical to the survival of the species, and
2. ***possible*** that the CEH Transmission Project will interfere with the recovery of the species.

Northern quoll (*Dasyurus hallucatus*)

A significance of impact assessment is provided in Att. 1 (CEH Transmission Project SIA 2023), section 5.7, pp 44 and is summarised below.

Camera trapping undertaken across the local area within the transmission line investigation area and related PHES investigation area have not captured northern quoll records, suggesting the local northern quoll population is not high-density. However, Eungella, Crediton and Clarke Ranges (areas all surrounding the transmission study area) are listed as important populations of the northern quoll in the National recovery plan for the northern quoll (Hill and Ward 2010). Within that broader context, the northern quoll population adjacent to the transmission line study area would constitute an ‘important’ population in that it contains high-density areas that have persisted long after cane toad invasion.

1. The construction of the transmission line has the potential to result in the following residual impacts on the northern quoll:
2. Loss of 132.37 ha of habitat critical to the survival of the species:
    - 128. 70 ha of foraging habitat; and
    - 3.67 ha of denning habitat.
3. Injury and mortality;
4. Habitat degradation by increased dust run-off and sedimentation;
5. Introduction and spread of pest fauna species and weeds; and
6. Fragmentation and barrier effects.

Of the significant impact criteria relevant to *Dasyurus hallucatus,* it was assessed that it is:

1. ***likely*** that the CEH Transmission Project will result in the loss of habitat critical to the survival of the species, and
2. from significant impact guidelines 1.1, ***likely*** that the CEH Transmission Project will adversely affect habitat critical to the survival of a species.

Yellow-bellied glider (south-eastern) (*Petaurus australis australis*)

A significance of impact assessment is provided in Att. 1 (CEH Transmission Project SIA 2023), section 5.8, pp 50 and is summarised below.

The yellow-bellied glider (south-eastern) has not been confirmed present in field surveys. Given the level of survey effort that has been undertaken for the project and the associated CEH PHES Project, the failure to detect the species has increased uncertainty over the species’ likelihood of occurrence. Targeted surveys are being undertaken in autumn and winter 2023 to further investigate the species’ likelihood of occurrence. Until those surveys are complete, a conservative approach has been taken and the species has been considered to have a high to moderate likelihood of occurrence given the presence of suitable habitat and nearby historical records.

Potential impacts on yellow-bellied glider population and habitat within the CEH Transmission Project include:

1. Loss of 39.59 ha of habitat critical to the survival of the species;
2. Disturbance to wildlife through increased light, noise and vibration;
3. Habitat degradation by increased dust run-off and sedimentation;
4. Introduction and spread of pest fauna species and weeds; and
5. Fragmentation and barrier effects.

Of the significant impact criteria relevant to *Petaurus australis australis*, it was assessed that it is:

1. ***possible*** that the CEH Transmission Project will lead to a long-term decrease in the size of an important population of the species, and
2. ***likely*** that the CEH Transmission Project will adversely affect habitat critical to the survival of the species.

Threatened Ecological Community – Poplar Box Grassy Woodland on Alluvial Plains

A significant impact assessment is provided in Att. 1 (CEH Transmission Project SIA 2023), section 5.1, pp 20 and is summarised below.

Approximately 4.45 ha of woodland vegetation meeting the definition of the Poplar Box Grassy Woodland on Alluvial Plains TEC was recorded on the Hazlewood Creek floodplain, on Turrawulla, near the southern extent of the transmission line study area. The vegetation met the key diagnostic and threshold condition criteria to qualify as the TEC.

Summary of residual impact: The CEH Transmission Project will result in the following impacts:

1. Direct clearing of 4.45 ha of poplar box grassy woodland TEC;
2. Local fragmentation of habitat; and
3. Potential for degradation of the ground layer through some weed.

Despite the avoidance achieved, the Project is likely to have a significant residual impact on the poplar box grassy woodland on alluvial plains TEC due to the reduction in the extent of occurrence and local fragmentation of the TEC.

Of the significant impact criteria relevant to Poplar Box Grassy Woodland on Alluvial Plains, it was assessed that it is:

1. ***likely*** that the CEH Transmission Project will reduce the extent of an ecological community;
2. ***likely*** that the CEH Transmission Project will fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines; and
3. ***possible*** that the CEH Transmission Project will interfere with the recovery of an ecological community.

4.1.4.7 Do you think your proposed action is a controlled action? *

Yes

4.1.4.8 Please elaborate why you think your proposed action is a controlled action. *

The CEH Transmission Project may cause a significant impact on Poplar Box grassy woodland on alluvial plains TEC, koala, greater glider (northern), northern quoll, grey-headed flying fox and yellow-bellied glider.

4.1.4.10 Please describe any avoidance or mitigation measures proposed for this action and attach any supporting documentation for these avoidance and mitigation measures. *

Where possible, habitat loss impacts associated with the construction and operation of the CEH Transmission Project have been avoided as much as practicable by route selection favouring disturbed areas, regrowth and existing infrastructure corridors consistent with the principles of the mitigation hierarchy. Where avoidance has not been possible, a range of best practice measures to minimise habitat clearing (such as higher towers and longer spans between towers) will be applied to design of the transmission line during concept stage in order to further minimise clearing required. The route has also been developed on the basis of geotechnical and landholder considerations.

Likewise, access track routes will be selected to favour cleared areas, existing tracks and to be co-located with tracks for the CEH PHES Project where possible.

Measures to mitigate impacts include development of a biodiversity offset strategy, species specific management (for example potential for translocation of Granite nightshade (*Solanum graniticum*)) and the development of Construction Environmental Management Plans (CEMPs) to address matters such as:

1. fauna injury and mortality prevention;

2. minimisation of habitat degradation by dust runoff and sedimentation;
3. disturbance to wildlife through increased light, noise and vibration;
4. introduction and spread of pest fauna species and weeds; and
5. fragmentation and barrier effects.

A list of avoidance and mitigation measures is included in Att. 1 (CEH Transmission Project SIA 2023), Appendix E (Avoidance and Mitigation Measures). It is expected that the proposed avoidance and mitigation measures will be further refined, and the effectiveness evaluated and reported, through the environmental assessment process.

4.1.4.11 Please describe any proposed offsets and attach any supporting documentation relevant to these measures. *

Environmental offsets are currently being considered and included in the development of a Biodiversity Offset Strategy.

4.1.5 Migratory Species

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

Direct impact	Indirect impact	Species
No	No	Actitis hypoleucos
No	Yes	Apus pacificus
No	No	Calidris acuminata
No	No	Calidris ferruginea
No	No	Calidris melanotos
No	No	Cuculus optatus
No	No	Gallinago hardwickii
Yes	Yes	Hirundapus caudacutus
Yes	Yes	Monarcha melanopsis
No	No	Motacilla flava
Yes	Yes	Myiagra cyanoleuca
No	No	Numenius madagascariensis
No	No	Pandion haliaetus
No	Yes	Rhipidura rufifrons
Yes	Yes	Symposiachrus trivirgatus

4.1.5.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

Yes

4.1.5.2 Briefly describe why your action has a direct and/or indirect impact on these protected matters. *

Following field surveys and targeted bird census, none of the migratory species from the PMST report (Att. 1 (CEH Transmission Project SIA 2023), Appendix A) were recorded in the project area, however six were considered to have a moderate to high likelihood of occurrence (White-throated needletail (*Hirundapus caudacutus*), Fork-tailed swift (*Apus pacificus*), Black-faced monarch (*Monarcha melanopsis*), Satin flycatcher (*Myiagra cyanoleuca*), Rufous fantail (*Rhipidura rufifrons*), and Spectacled monarch (*Symposiachrus trivirgatus*)).

Direct disturbance may occur to migratory species where habitat utilised by the species is cleared as part of the final project footprint.

Indirect disturbance may occur where retained habitat utilised by the species may be affected by:

1. Habitat degradation through increased dust, run-off and sedimentation;
2. Introduction and spread of pest fauna species and weeds; and
3. Noise, vibration, dust and light from construction activities.

Att. 1 (CEH Transmission Project SIA 2023), Figure 5-10, pp 62 shows the predicted habitat of the White-throated needle tail, Att. 1 (CEH Transmission Project SIA 2023), Figure 5-11, pp 64 the Forktail swift and Att. 1 (CEH Transmission Project SIA 2023), Figure 5-12, pp 67 other migratory species.

Potential disturbance areas and impacts have been assessed for both transmission options (15 and 16) with the option of greatest impact forming the basis for significant impact assessments as follows:

1. Fork-tailed swift (*Apus pacificus*): 132.37 ha for option 16 (132.15 ha for option 15);
2. Satin flycatcher (*Myiagra cyanoleuca*) and Rufous fantail (*Rhipidura rufifrons*): 5.17 ha for option 15 (4.54 ha for option 16); and
3. Black-faced monarch (*Monarcha melanopsis*) and Spectacled monarch (*Symposiachrus trivirgatus*): 11.52 ha for option 15 (4.68 ha for option 16).

4.1.5.4 Do you consider this likely direct and/or indirect impact to be a Significant Impact? *

No

4.1.5.6 Describe why you do not consider this to be a Significant Impact. *

A significant impact assessment against impact criteria has determined that there will unlikely be a significant residual impact on migratory species.

Where impacted species listed in the table at question 4.1.5 have been assessed as having no significant residual impact as a result of the proposed action, reasons are specified in the assessment of that migratory species in Att. 1 (CEH Transmission Project SIA 2023), sections 5.10 - 5.12, pp 59-65.

4.1.5.7 Do you think your proposed action is a controlled action? *

No

4.1.5.9 Please elaborate why you do not think your proposed action is a controlled action. *

A significance of impact assessment (see Att. 1 (CEH Transmission Project SIA 2023), sections 5.10 - 5.12, pp 59-65) has determined that there is unlikely to be any significant impact on listed migratory species.

4.1.5.10 Please describe any avoidance or mitigation measures proposed for this action and attach any supporting documentation for these avoidance and mitigation measures. *

Where possible, habitat loss impacts associated with the construction and operation of the CEH Transmission Project have been avoided as much as practicable by route selection favouring disturbed areas, regrowth and existing infrastructure corridors consistent with the principles of the mitigation hierarchy. Where avoidance has not been possible, a range of best practice measures to minimise habitat clearing (such as higher towers and longer spans between towers) will be applied to design of the transmission line during concept stage in order to further minimise clearing required. The route has also been developed on the basis of geotechnical and landholder considerations.

Likewise, access track routes will be selected to favour cleared areas, existing tracks and to be co-located with tracks for the CEH PHES Project where possible.

Measures to mitigate impacts include development of a biodiversity offset strategy, species specific management (for example potential for translocation of Granite nightshade (*Solanum graniticum*)) and the development of Construction Environmental Management Plans (CEMPs) to address matters such as:

1. fauna injury and mortality prevention;
2. minimisation of habitat degradation by dust runoff and sedimentation;
3. disturbance to wildlife through increased light, noise and vibration;
4. introduction and spread of pest fauna species and weeds; and
5. fragmentation and barrier effects.

A list of avoidance and mitigation measures is included in Att. 1 (CEH Transmission Project SIA 2023), Appendix E (Avoidance and Mitigation Actions). It is expected that the proposed avoidance and mitigation measures will be further refined, and the effectiveness evaluated and reported, through the environmental assessment process.

4.1.5.11 Please describe any proposed offsets and attach any supporting documentation relevant to these measures. *

If environmental offsets are required they will be included in the development of a Biodiversity Offset Strategy being developed for the project.

4.1.6 Nuclear

4.1.6.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

4.1.6.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The proposed action is an electricity transmission line and substation and will not involve the use or storage of radioactive materials.

4.1.7 Commonwealth Marine Area

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.7.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.7.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

There are no Commonwealth Marine Areas located within the project area.

4.1.8 Great Barrier Reef

4.1.8.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

4.1.8.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The project area is not located in or near the Great Barrier Reef Marine Park. The project area is located within the Broken River catchment which does ultimately drain to the Great Barrier Reef some 280km downstream of the project (see Att. 2, Figure 4).

The construction and operation of the CEH Transmission Project will not involve significant disturbance or hydrologic alteration to waterways. Soil disturbance will be temporary and controlled during construction.

4.1.9 Water resource in relation to large coal mining development or coal seam gas

4.1.9.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

4.1.9.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The CEH Transmission Project is an electricity transmission project and has no relationship to coal mining or coal seam gas development.

4.1.10 Commonwealth Land

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.10.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.10.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

There are no Commonwealth Lands located within the project area.

4.1.11 Commonwealth Heritage Places Overseas

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.11.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.11.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The project is not located in or near Commonwealth Heritage Places Overseas.

4.1.12 Commonwealth or Commonwealth Agency

4.1.12.1 Is the proposed action to be taken by the Commonwealth or a Commonwealth Agency? *

No

4.2 Impact summary

Conclusion on the likelihood of significant impacts

You have indicated that the proposed action will likely have a significant impact on the following Matters of National Environmental Significance:

- Threatened Species and Ecological Communities (S18)

Conclusion on the likelihood of unlikely significant impacts

You have indicated that the proposed action will unlikely have a significant impact on the following Matters of National Environmental Significance:

- World Heritage (S12)
- National Heritage (S15B)
- Ramsar Wetland (S16)
- Migratory Species (S20)
- Nuclear (S21)
- Commonwealth Marine Area (S23)
- Great Barrier Reef (S24B)
- Water resource in relation to large coal mining development or coal seam gas (S24D)
- Commonwealth Land (S26)
- Commonwealth Heritage Places Overseas (S27B)
- Commonwealth or Commonwealth Agency (S28)

4.3 Alternatives

4.3.1 Do you have any possible alternatives for your proposed action to be considered as part of your referral? *

No

4.3.8 Describe why alternatives for your proposed action were not possible. *

Preferred options for the transmission line have been identified through desktop analysis and field survey and have considered topography, geology, environmental and infrastructure constraints. Ten options have been actively considered as shown in Att. 2 (Additional Maps), Figure 5, Transmission Options Considered. Options 7-14 (including sub-variations to 11 and 15) have been discounted due to a range of factors including land access, difficult terrain, mapped sensitive environmental areas, route length and disturbance areas, landholder considerations and buffer requirements for components of the CEH PHES Project.

While options 15 and 16 are the current preferred options, the project area for the transmission line (see Att. 1 (CEH Transmission Project SIA 2023), Figure 1-2, pp 4) remains large enough in the unlikely event that changes to the route are necessary following further studies and consultation with the relevant stakeholders. Further, route selection is expected to change after further ecological surveys in the investigation area refine knowledge of the distribution of MNES species and TECs.

Further, additional field work is required to clarify desktop studies undertaken in relation to ground conditions (i.e. geotechnical and soil conditions).

For the purposes of this referral, significant impact assessments have been based on the transmission option with the greatest impact on the relevant species or community.

5. Lodgement

5.1 Attachments

1.2.1 Overview of the proposed action

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Att 1 CEH Tx SIA 2023.pdf Project definition, ecological survey methodology and results (targetted to project and MNES), likelihood of occurrence and significance of impact assessments for MNES threatened species, migratory species and threatened ecological communities.	11/08/2023	No	High
#2.	Document	Att 2 Additional Maps v2 2023-10-20.pdf Maps referenced in form not already included in Attachment 1.	20/10/2023	No	High

1.2.7 Public consultation regarding the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Att 3 CEH Tx CCSEP.pdf Community consultation plan for the Capricornia Energy Hub	13/10/2023	No	High

3.3.2 Indigenous heritage values that apply to the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Tx Referral Attachment 3.3.2 CHIMA.PDF Cultural heritage Investigation and Management Agreement	18/11/2022	Yes	High

3.4.1 Hydrology characteristics that apply to the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Link	Lower Burdekin Water Quality Improvement Plan https://wetlandinfo.des.qld.gov.au/resources/sta..			High
#2.	Link	Understanding and managing groundwater and salinity in a tropical conjunctive water use irrigation d https://ideas.repec.org/a/eee/agiwat/v95y2008i10..	01/01/2008		Low or uncertain
#3.	Link	Water Monitoring Information Portal https://water-monitoring.information.qld.gov.au/			High

5.2 Declarations

Completed Referring party's declaration

The Referring party is the person preparing the information in this referral.

ABN/ACN	661700867
Organisation name	EUNGELLA INFRASTRUCTURE PTY LTD
Organisation address	3000 VIC
Representative's name	Matthew Buchanan
Representative's job title	General Manager Environment and Stakeholders
Phone	1800979686
Email	mbuchanan@repartners.com.au
Address	Level 6 200 Adelaide Street BRISBANE QLD 4000

☑ Check this box to indicate you have read the referral form. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *

☑ By checking this box, I, **Matthew Buchanan of EUNGELLA INFRASTRUCTURE PTY LTD**, declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *

Completed Person proposing to take the action's declaration

The Person proposing to take the action is the individual, business, government agency or trustee that will be responsible for the proposed action.

ABN/ACN	661700867
Organisation name	EUNGELLA INFRASTRUCTURE PTY LTD
Organisation address	3000 VIC
Representative's name	Sebastian Burgman
Representative's job title	Project Director
Phone	1800979686
Email	sebu@cipprojects.dk
Address	Level 6, 200 Adelaide Street, BRISBANE, QLD, 4000

☑ Check this box to indicate you have read the referral form. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *

☑ I, **Sebastian Burgman of EUNGELLA INFRASTRUCTURE PTY LTD**, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that

giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf or for the benefit of any other person or entity. *

☑ I, **Sebastian Burgman of EUNGELLA INFRASTRUCTURE PTY LTD**, the Person proposing the action, consent to the designation of **Haidar Etemadi of BLUE POWER PARTNERS PTY LTD** as the Proposed designated proponent for the purposes of the action described in this EPBC Act Referral. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *

Completed Proposed designated proponent's declaration

The Proposed designated proponent is the individual or organisation proposed to be responsible for meeting the requirements of the EPBC Act during the assessment process, if the Minister decides that this project is a controlled action.

ABN/ACN	18637681737
Organisation name	BLUE POWER PARTNERS PTY LTD
Organisation address	3000 VIC
Representative's name	Haidar Etemadi
Representative's job title	Senior Planner
Phone	1800979686
Email	het@bluepp.dk
Address	Level 35, 477 Collins Street MELBOURNE VIC 3000

☑ Check this box to indicate you have read the referral form. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *

☑ I, **Haidar Etemadi of BLUE POWER PARTNERS PTY LTD**, the Proposed designated proponent, consent to the designation of myself as the Proposed designated proponent for the purposes of the action described in this EPBC Act Referral. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *