CopperString Project

Coordinator-General's evaluation report on the environmental impact statement

September 2022

COORDINATOR-GENERAL

Queensland Government

The Department of State Development, Infrastructure, Local Government and Planning improves productivity and quality of life in Queensland by leading economic strategy, industry development, infrastructure and planning, for the benefit of all.

Acknowledgement of Country

The department acknowledges the country and people of Queensland's First Nations. We pay our respect to elders, past, present and emerging. We acknowledge the continuous living culture of First Nations Queenslanders – their diverse languages, customs and traditions, knowledges and systems. We acknowledge the deep relationship, connection and responsibility to land, sea, sky and country as an integral element of First Nations identity and culture.

This Country is sacred. Everything on the land has meaning and all people are one with it. We acknowledge First Nations peoples' sacred connection as central to culture and being. We acknowledge the stories, traditions and living cultures of First Nations peoples and commit to shaping our state's future together. The department recognises the contribution of First Nations peoples and communities to the State of Queensland and how this continues to enrich our society more broadly.

Copies of this publication are available on our website at **www.statedevelopment.qld.gov.au** and further copies are available upon request to:

Department of State Development, Infrastructure, Local Government and Planning
PO Box 15517 City East Qld 4002.
1 William Street Brisbane Qld 4000 (Australia)

Phone: 13 QGOV (13 7468)
Fax: 07 3220 6502
Email: **info@dsdilgp.qld.gov.au**
Web: **www.statedevelopment.qld.gov.au**

Source number D22/172880

Contents

Appendices

Figures

Tables

Synopsis

This report provides my evaluation of the environmental impact statement (EIS) for the CopperString Project (the project). This evaluation has been prepared pursuant to section 34D of the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act).

This report includes an evaluation of matters of national environmental significance (MNES) and recommended conditions to the Commonwealth Minister for the Environment (the Commonwealth Minister) to inform a subsequent decision under the under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). The evaluation of matters under the EPBC Act in this report is consistent with the Queensland Assessment Bilateral Agreement between the State of Queensland and the Australian Government.

The report also includes recommended conditions for proposed subsequent ministerial infrastructure designations (MIDs) for the consideration of the Queensland Planning Minister under the *Planning Act 2016* (Qld) (Planning Act). The MID recommendations in this report support the mitigation measures and commitments described by the proponent in the EIS for the project.

In undertaking the evaluation, I have considered the draft EIS, the revised draft EIS, submissions made during public consultation on the draft EIS, and advice I have received from relevant Australian, state and local government agencies.

Project description and rationale

CuString Pty Ltd, an Australian Private Company based in Townsville, proposes to construct an overhead high voltage electricity transmission line, connecting the North West Power System to the state electricity grid. The project would enable participation in the National Electricity Market for customers and future power generators along the project corridor, where price and standards of service are governed at the national level.

The project is for an approximately 740 kilometre (km) long transmission line, that would run from a new substation at Woodstock, south of Townsville, to connect with the North West Power System, west of Cloncurry. The project would also augment the powerline to Mount Isa and include a southern extension from Cloncurry, to substations at Selwyn and Woodya, increasing the transmission line for the project to approximately 1,000 km.

The project would require 6 new substations, transmission towers every 500 to 600 metres (m), access tracks to the corridor and along its alignment, a minimum of 4 construction camps, site offices, laydown/delivery areas and concrete batching plants. The project also provides for improved communications, with the installation of fibre optic cables.

The North West Minerals Province is one of the world's richest producing mineral regions and is emerging as an exploration area for new economy minerals and metals, such as vanadium, that are critical to the production of renewable energy technologies such as solar panels, wind turbines and large scale batteries. The EIS states that the project is predicted to reduce electricity prices in the North West Power System and has the potential to stimulate investment in the North West Minerals Province.

The EIS states that the project traverses a region of significant potential renewable energy resources that are currently constrained by the lack of access to the state electricity grid. The project is expected to unlock potential areas for renewable energy generation in the Northern Queensland Renewable Energy

Zone between Townsville and Hughenden (particularly wind resources) and in the North West Minerals Province.

The proponent estimates capital expenditure for the project would be at least $1.75 billion with up to 750 full time equivalent jobs created during construction and up to 30 full time equivalent jobs during operation.

The project traverses 7 local government areas; Burdekin, Charters Towers, Flinders, Richmond, McKinlay, Cloncurry and Mount Isa. The main towns within proximity to the project are Townsville, Charters Towers, Hughenden, Richmond, Julia Creek, Cloncurry and Mount Isa. The project traverses the traditional lands of the Birriah, Jangga, Yirendali, Wanamara, Mitakoodi, Kalkadoon and Yulluna Peoples, Traditional Custodians of the land on which the project is proposed.

The following provides an overview of the main issues arising from my evaluation.

Project development

The proponent, CuString, is the same entity that proposed a previous CopperString Project. Following public notification of the draft EIS for the previous project in December 2010, and a supplementary EIS in September 2011, the proponent decided not to pursue the previous project.

The 2010 route selection report informed corridor selection for the current project. The 5 km wide study corridor identified in 2010 was refined to the current project corridor (between 60 m and 120 m wide) through a corridor selection process to avoid environmental, social and economic impacts to the greatest extent possible. The current project corridor was informed by consultation with landholders and stakeholders.

Several aspects of the project remain under investigation and will be resolved during detailed design. For instance, the exact locations of laydown/delivery areas, concrete batching plants and construction camps have not yet been identified. Concept transmission tower sites were considered in the EIS, rather than the exact location of all transmission towers. Where transmission tower sites needed to be placed in waterways, specific design requirements were considered at these locations.

The evaluation of the project in this report therefore is reflective of the stage of the project's development. I have identified further information that will be required to inform subsequent applications, particularly requests for MIDs. During detailed design and informed by pre-clearance surveys, it is expected that further avoidance and minimisation of impacts to environmental values would be achieved through the siting and configuration of development footprints, for instance transmission tower locations.

The project would be constructed in a staged format. Nine construction hubs were identified in the EIS to support construction activities along the alignment. The exact staging of construction is being considered by the proponent.

Land use and landholders

The proponent proposes to proceed through a MID process as an alternative to lodging multiple development applications with the 7 local governments over the project corridor. A MID is decided by the Planning Minister and provides a streamlined whole-of-government consideration of a project. It is unlikely that one MID would be lodged for the entire project, rather it is expected that MIDs for the project would be lodged in stages.

This report includes recommended conditions to the Planning Minister for MIDs. Recommended conditions have been informed by the assessment of specific matters throughout the EIS, including assessment of matters of state environmental significance, land use, water resources, transport, cultural heritage, air quality, greenhouse gases, noise, vibration, visual amenity, hazards and risk, and waste management.

The project is consistent with the North Queensland Regional Plan 2020 and the North West Regional Plan 2010 – 2031. Both plans support the development of infrastructure within these regions. The North Queensland Regional Plan identifies that a resilient infrastructure network would support economic opportunities within the region and the North West Regional Plan emphasises the importance of reliable and cost effective energy infrastructure for the region.

The proponent proposes to negotiate easements for the land required for the corridor with landholders. I have included in this report recommended conditions that weed and pest management measures be implemented during construction. This report also includes recommended conditions to require consultation with landholders during detailed design to ensure land use conflicts are minimised, these may include locating infratructure to reduce rural land fragmentation and landholder disturbance, where practicable.

The EIS states that the project is anticipated to have limited impacts on native title, although these aspects remain under investigation and the proponent has committed to ongoing engagement outside of the EIS process.

Detailed evaluation of this topic can be found in section 5.1 of this report.

Matters of national environmental significance

The project would impact on MNES protected under the EPBC Act. The controlling provisions for the project under the EPBC Act are listed threatened species and communities (sections 18 and 18A) and listed migratory species (sections 20 and 20A) (EPBC 2019/8416).

In accordance with the Queensland Assessment Bilateral Agreement, the EIS meets the impact assessment requirements of both Commonwealth and Queensland legislation. Under the agreement, this report includes my evaluation of MNES matters applicable to the project. This evaluation has been informed by consultation with the Australian Department of Climate Change, Energy, the Environment and Water (DCCEEW).

The proponent was required to complete comprehensive field surveys to confirm the occurrence of MNES, including listed threatened species and communities and listed migratory species. I note that agencies with an interest in biodiversity (including the DCCEEW) generally agreed that the survey effort undertaken by the proponent was adequate for a reliable, precautionary quantification of predicted impacts on MNES at this stage of the project development.

The potential impacts on MNES were quantified in the EIS based on a maximum impact scenario. I have included in this report recommended conditions to the Commonwealth Minister that would require the proponent to undertake targeted pre-clearance surveys to confirm the presence of MNES and the actual extent of impact, prior to commencement of construction.

My recommended conditions to the Commonwealth Minister also require the actual significant residual impact to be confirmed by a post-construction audit and offsets required in accordance with the EPBC Act. Since acceptance of the final EIS, the proponent has prepared an updated draft biodiversity offset management strategy for the project, which identifies 8 properties as potential biodiversity offset sites for the project.

The proponent has also made a number of commitments to further avoid or minimise impacts on MNES, including the avoidance and/or spanning of areas of high value riparian vegetation adjacent to watercourses, locating access tracks within existing cleared or disturbed land, installing fauna exclusion fencing, co-locating laydown/delivery areas and substation sites, and imposing strict no-go zones to protect habitat.

I note rehabilitation of temporarily disturbed areas not required during the operation and maintenance of the project would occur progressively as construction works are completed along the project corridor. I have recommended a condition to the Commonwealth Minister that would require the proponent to rehabilitate these areas to a state comparable to its pre-disturbed state using endemic native species and to monitor rehabilitated areas for a period of time to ensure the vegetation community is well established.

The EIS appropriately considered the impacts of the project on migratory species and concluded that there would not be a significant residual impact on any migratory species. I accept this conclusion, noting that the project has been conceptually designed to avoid areas which provide habitat for migratory species and the proponent has committed to further avoid or minimise impacts during detailed design.

The EIS appropriately considered the impacts of the project on threatened ecological communities. No listed threatened ecological communities under the EPBC Act were confirmed present within the project corridor. I accept this conclusion.

Listed threatened species

There were 3 threatened flora species and 10 threatened fauna species considered in the EIS.

The EIS concluded that the project could result in the disturbance of suitable habitat for the pink gidgee (219.41 hectare (ha)), black ironbox (2.95 ha) and waxy cabbage palm (26.38 ha). These disturbance areas represent a maximum impact scenario.

Pre-clearance surveys for the project would confirm the presence of individual occurrences of each threatened flora species. The proponent has committed to avoid the removal/disturbance of these species through design considerations (i.e. transmission tower location, type and height). I accept the EIS findings that significant residual impacts are unlikely given pre-clearance surveys and detailed design are likely to ensure the project is sited to avoid individuals. I have recommended a condition to the Commonwealth Minister that if pre-clearance surveys and detailed design indicate that avoidance of threatened flora species is not possible, the significant residual impacts would require offsets to compensate for the loss.

The EIS concluded that the project could result in disturbance of suitable habitat for the koala (393.21 ha), squatter pigeon (50.82 ha), black-throated finch (705.90 ha), night parrot (308.30 ha), Australian painted snipe (219.14 ha), painted honeyeater (945.57 ha), Julia Creek dunnart (243.28 ha), ornamental snake (69.82 ha) and plains death adder (121.78 ha). These disturbance areas represent a maximum impact scenario which I have recommended to the Commonwealth Minister to set as the maximum disturbance limit for the impacts to threatened fauna species.

I consider the permanent loss of suitable habitats for these species a significant residual impact, which requires offsets to compensate for the loss. I have recommended that the Commonwealth Minister require offsets for significant residual impacts for the koala, squatter pigeon, black-throated finch, night parrot, Australian painted snipe, painted honeyeater, Julia Creek dunnart, ornamental snake and plains death adder. The results of any further survey work and final project design would inform the project's final significant residual impact and offset obligations for threatened fauna species.

The updated draft biodiversity offset management strategy for the project identifies properties as potential biodiversity offset sites for the project that could offset the significant residual impacts to these listed threatened fauna species, up to the maximum disturbance limits.

I have also recommended a condition to the Commonwealth Minister requiring the proponent to prepare species management plans which would include species-specific management measures. For example, the species management plan for the koala must include measures enforcing speed limits within areas adjacent to koala habitat and ensuring clearing occurs sequentially and outside of peak breeding season. Other species-specific management measures must include flushing of areas of squatter pigeon habitat to allow for species dispersal, installation of high visibility tags and reflective tape along the transmission line to reduce collision risks for the night parrot and no clearing of vegetation within 400 m of nesting sites for the black-throated finch.

Detailed evaluation of MNES can be found in Chapter 6 of this report.

Matters of state environmental significance

Matters of state environmental significance (MSES) are environmental values that are protected under Queensland legislation. MSES potentially impacted by the project include regulated vegetation, connectivity areas, protected wildlife habitat for threatened flora and fauna species, protected areas and wetlands.

The proponent was required to complete comprehensive field surveys to confirm the occurrence of MSES. I note that agencies with an interest in biodiversity, including the Department of Environment and Science (DES) and Department of Resources, generally agreed that the survey effort undertaken by the proponent was adequate for a reliable, precautionary quantification of predicted impacts on MSES.

The project has avoided impacts on MSES values, where possible. I have recommended a condition to the Planning Minister for future MIDs requiring the proponent to undertake pre-clearance surveys to confirm presence of MSES and the actual extent of impact. If avoidance of MSES impacts is not possible, the significant residual impacts would require offsets to compensate for the loss.

There is considerable overlap between the MNES and MSES relevant to the project. Rather than duplicating aspects of this evaluation that relate to both MNES and MSES, overlapping matters are assessed in the MNES section of this report only. This approach is consistent with the Queensland Assessment Bilateral Agreement between the State of Queensland and the Australian Government. The state can not duplicate conditions for offsets for prescribed environmental matters that are MSES which are also MNES. DCCEEW and DES were consulted during the EIS process in consideration of overlaps between MSES and MNES.

Detailed evaluation of MNES can be found in Chapter 6 of this report.

Regulated vegetation and protected wildlife habitat

The concept design process considered minimising remnant vegetation clearing through project siting.

The EIS concluded that the project could result in the clearance of up to 808.14 ha of regulated vegetation. Vegetation clearing for regulated vegetation is ‘exempt clearing work’ under the *Vegetation Management Act 1999* due to the Planning Act provisions relevant to the project. Offset requirements for clearing of regulated vegetation are therefore not required.

Essential habitat for the ornamental snake, squatter pigeon, Julia Creek dunnart and waxy cabbage palm are considered in the MNES section of this report. The offset requirements for these threatened

species would be compensated for through the required offsets for the loss of habitat for species listed under the EPBC Act, where these matters overlap.

This report has considered essential habitat for the purple-necked rock wallaby as part of the protected wildlife habitat for the species, which includes all suitable areas for foraging, roosting, nesting and/or breeding. I consider the permanent loss of 90.77 ha of protected wildlife habitat for the purple-necked rock wallaby a significant residual impact. Therefore, environmental offsets are needed. I have recommended conditions to the Planning Minister for future MIDS to require the verification of impact areas prior to any clearing and the provision of offsets to compensate for the loss.

A number of species identified as MSES under the Queensland *Nature Conservation Act 1992*, but not as MNES, were recorded or considered likely to occur within the project corridor. The EIS appropriately considered potential direct and indirect impacts on protected wildlife habitat for the common death adder, short-beaked echidna, grey falcon and northern leaf-nosed bat and concluded that there would not be a significant residual impact on these matters where appropriate avoidance and mitigation measures are implemented. I accept this conclusion. The EIS found that in the long-term the placement of artificial structures could provide benefit to the grey falcon through the provision of additional nesting habitat where transmission towers are placed within suitable nesting habitat areas for the species.

The project would result in a maximum disturbance of 5.37 ha of protected wildlife habitat for the Mount Isa mallee. I am satisfied that a significant residual impact is unlikely as pre-clearance surveys undertaken during detailed design would inform transmission tower placement, heights and span lengths to avoid these areas, including all individual occurrences of the species.

The EIS states that connectivity areas potentially impacted by the project are generally associated with riparian corridors of major rivers and their tributaries. I have recommended conditions to the Planning Minister for future MIDs to require the proponent to implement their commitments including to site permanent infrastructure such as transmission towers outside of all watercourses and their associated riparian zones where possible to reduce impacts on connecting vegetation. I am therefore satisfied that a significant residual impact is unlikely for connectivity areas from the project.

I am satisfied that the EIS demonstrated that no wetlands of high ecological significance are expected to be adversely impacted by the project. A wetland protection area buffer would be intersected by the project corridor for approximately 700 m, however I note that the wetland itself is located 350 m southeast of the project corridor.

Detailed evaluation of this topic can be found in section 5.2 of this report.

Protected areas - Ballara Nature Refuge

The project's Southern Connection section from the Dajarra Road Substation near Cloncurry to the Selwyn Substation intersects approximately 191.52 ha of the Ballara Nature Refuge. I note the proponent has investigated the feasibility of several alternative corridor alignments for this section of the project and that the preferred alignment would have fewer impacts on habitat values, existing infrastructure, has received landholder support, and is more efficient and cost-effective.

I acknowledge that the project is not permitted to be constructed or operated within the Ballara Nature Refuge until the part of the refuge intersected by the project is revoked. The conservation agreement for the refuge would need to be amended to reflect the redefined boundary and agreed to by the landholder and DES. An offset would be required as a replacement for any revoked portions of the Ballara Nature Refuge in addition to the offsets required for significant residual impacts on MSES located within the refuge, as identified in the updated biodiversity offset management strategy for the project.

I have included recommendations in this report for the proponent to report to the Planning Minister in MID requests on consultation progress with the Ballara Nature Refuge landholder. I am satisfied that the obligation to offset an area greater than the area being revoked would ensure no net loss of habitat values.

Detailed evaluation of this topic can be found in section 5.2.8 of this report.

Water resources

The project crosses multiple large water catchments, with several river systems draining from these catchments including the Haughton River, Burdekin River, Cooper Creek, Flinders River, Leichardt River and Georgina River. The EIS found the majority of waterways located near the project corridor are ephemeral, with flows only experienced during the wet season. Site surveys also found evidence of disturbance and degradation of waterways with weeds, erosion and reduced water quality identified.

To avoid or minimise potential impacts on surface water flows and flood risk, transmission towers and ancillary infrastructure have been sited to avoid existing large channel river systems (braided ephemeral systems) where possible, with transmission towers to be designed to withstand seasonal flows or larger flooding events. The final locations of project infrastructure would be determined during detailed design. I have made recommendations to the Planning Minister for future MIDs requiring the proponent to implement the commitments and mitigation measures in the EIS, including ensuring permanent project infrastructure is located away from flood prone areas where practicable, scheduling construction to avoid seasonal wet weather periods in areas of high flooding risk, and design of transmission towers to withstand expected flood events.

I have made recommendations to the Planning Minister for future MIDs requiring the proponent to prepare and implement a Construction Environmental Management Plan (CEMP) that would include erosion and sediment control and water quality protection measures. These measures include minimising clearing of vegetation, retention of riparian vegetation where practicable to maintain bank stability, progressive rehabilitation of construction areas, appropriate storage of hazardous and non-hazardous materials, and design of sewage treatment plants for construction camps to meet relevant standards. The CEMP would include monitoring of water quality upstream and downstream of project sites to demonstrate compliance with water quality objectives.

The proponent would use existing access tracks and waterway crossings, where agreed with landholders. Where a new waterway crossing is required for an access track, it would be designed in consultation with the Department of Agriculture and Fisheries (DAF) and comply with accepted development requirements for waterway barrier works. I have recommended that any future MID requests report on consultation with DAF regarding any necessary waterway barrier works.

The project would require water supply for construction activities including concrete batching and for operation of construction camps. I have recommended the proponent develop a construction water plan in consultation with the Department of Regional Development, Manufacturing and Water (DRDMW) which would identify water sources. Where surface water volumes are insufficient to meet project demand, I have recommended the proponent consult with DRDMW and local governments to determine whether groundwater could be extracted using existing licences and authorised groundwater reserves.

Detailed evaluation of this topic can be found in section 5.3 of this report.

Transport

An increased amount of traffic is expected to be generated on state controlled roads and local roads from vehicles delivering materials to construction sites and from daily workforce movements between construction camps and construction sites.

As part of the EIS the proponent prepared a traffic impact assessment (TIA) to identify transport networks that may be used to access the project, potential impacts and mitigation measures. The TIA does not satisfy the requirements of the Department of Transport and Main Road's (DTMR's) Guide to Traffic Impact Assessment (GTIA). Consistent with DTMR advice, I have included a recommendation for the proponent to submit an updated TIA in accordance with the GTIA with any future MID requests. The TIA would need to detail the impacts predicted to the safety, efficiency and condition of state controlled roads and local roads from construction and operation activities. The updated TIA would also be required to include a rail impact assessment detailing peak traffic volumes and over-dimensional vehicles that would cross railway level crossings, and queuing distances. Mitigation works and actions identified in the TIA would need to be implemented in accordance with DTMR and local government requirements.

I have also made recommendations to the Planning Minister for future MIDs for traffic management plans (TMPs) and road use management plans (RUMPs) to be prepared prior to construction, informed by the updated TIA. These plans would identify the appropriate management of project impacts on road link capacity, access, pavements, intersections and railway level crossings. These plans would be prepared in consultation with the DTMR, Queensland Rail, the Department of Education and local government. Mitigation measures are expected to include the use of a combination of fly-in, fly-out and bus-in, bus-out transport for the workforce, widening of intersections and adequate signage to manage road safety, scheduling of long-distance haulage outside of school bus peak times and rehabilitation of road pavements at end of the construction stage.

Detailed evaluation of this topic can be found in section 5.4 of this report.

Economics

The North West Queensland region currently pays significantly higher electricity prices than those connected to the National Electricity Market, as electricity supply is dominated by gas-fired generation, which has seen large price increases in recent years.

The project would connect North West Queensland to the National Electricity Market, where price and standards of service are governed at the national level. The EIS states that the project is predicted to reduce electricity prices, increase the competitiveness, and has the potential to stimulate investment in the North West Minerals Province. The EIS states that the project would reduce the reliance of North West Queensland on gas-fired generation and increase opportunities for renewable generation.

The EIS concluded that there are potentially significant benefits in the North West Queensland region arising from the project, however these benefits could result in increased costs for all business and residential electricity customers in Queensland. The Queensland Government is considering options to deliver affordable, secure, reliable, and sustainable electricity supply in the North West Minerals Province. A Consultation Regulatory Impact Statement was released for public consultation in December 2021, seeking feedback on options, including the project, to supply electricity in the North West Minerals Province.

The project would also traverse the Northern Queensland Renewable Energy Zone, which has some of Queensland's highest quality potential renewable energy generating areas, connecting them to the

National Electricity Market. The EIS states that providing this connection could unlock areas that may produce significant wind or solar renewable energy generation.

The proponent estimates that the project would require capital expenditure of at least $1.75 billion and would employ up to 750 full time equivalent jobs during construction and up to 30 full time equivalent jobs during operation. In addition to direct jobs generated, the project could provide flow-on procurement and employment opportunities for local businesses and residents should the project stimulate investment in the North West Minerals Province and the Northern Queensland Renewable Energy Zone.

Submissions on the EIS raised objections to the input assumptions used to undertake the economic impact assessment, and the conclusions drawn as to the project's projected benefits, anticipated cost impacts and regulatory arrangements. I acknowledge that the assumptions presented in the EIS for predicting job figures and economic benefits can be contested, however, the EIS has provided sufficient information to indicate the project would provide a benefit to the North West Queensland region and provide local employment and supply chain opportunities.

The proponent is working with the Queensland Government, separate to the EIS, to finalise arrangements about how the project could be delivered.

Detailed evaluation of this topic can be found in section 5.5 of this report.

Social

Overall, I consider the project would deliver direct social benefits for the North West Queensland region from increased employment and business opportunities during construction, and indirect social benefits from increased employment and business opportunities should the project stimulate investment in the North West Minerals Province and the Northern Queensland Renewable Energy Zone.

To ensure the potential social impacts identified in the EIS are avoided, minimised or mitigated, and benefits enhanced, I have imposed a condition requiring a social impact management plan (SIMP) for the project prior to construction commencing. This will also ensure proposed management strategies respond to the social landscape that is current at the time of construction.

The proponent has committed to use a local workforce, where possible, to fill the up to 750 full time equivalent jobs during construction and the up to 30 full time equivalent jobs during operation. To manage impacts on skilled labour in the North West Queensland region, the proponent has committed to continue engagement with regional stakeholders regarding timing of other projects in the region, maximising Indigenous employment opportunities, and identifying opportunities for apprentices and trainees. The proponent is required to report on implementation of workforce management strategies and local and Indigenous training and development opportunities as part of the project's finalised SIMP.

The project requires dedicated workforce construction camps at 7 of the 9 construction hubs, at: Charters Towers, Cloncurry, Hughenden, Julia Creek, Pentland, Richmond and Selwyn. The EIS states that workers at the Mount Isa and Woodstock or Ayr construction hubs would use existing local accommodation nearby. I have recommended that in any future MID requests the proponent report on engagement with relevant local governments regarding the location and servicing of construction camps.

The EIS and submissions also identified potential landholder impacts to road access, land severance, dust, noise and vibration during construction, and potential impacts on the productivity of agricultural land. The proponent will negotiate compensation agreements and land access management plans with each landholder, implement appropriate noise and dust management measures, and develop a complaints management procedure to effectively respond to and monitor any complaints. I consider the implementation of these measures would satisfactorily address the risk of landholder impacts.

Detailed evaluation of this topic can be found in section 5.6 of this report.

Cultural heritage

The project traverses through country significant to 8 Aboriginal Traditional Owner groups, referred to as Aboriginal parties by the *Aboriginal Cultural Heritage Act 2003* (ACH Act): Birriah People, Jangga People, Yirendali People, Wabanara People, Mitakoodi People, Kalkadoon People and Yulluna People. The EIS identified 236 registered cultural heritage sites and one registered cultural heritage polygon across land significant to 5 Aboriginal parties.

To protect Aboriginal cultural heritage values, the EIS states that the proponent would firstly avoid harm where possible and develop Cultural Heritage Management Plans (CHMPs) with each Aboriginal party. The CHMPs would detail a clear process for managing Aboriginal cultural heritage, including roles and responsibilities of the parties and cultural heritage survey and management processes to comply with requirements of the ACH Act. I note the EIS identified one portion of the study area has no identified Aboriginal party and the proponent is undertaking a process to identify the relevant Aboriginal party/ies, prior to developing a CHMP for this area.

The EIS identified 23 Queensland (non-Indigenous) heritage listed state or local government places within 5 km of the project area. The proponent has committed to prepare a CEMP, which would include procedures to be followed for identifying, reporting and managing Queensland cultural heritage in accordance with the *Queensland Heritage Act 1992*.

I am satisfied the EIS appropriately considered potential impacts to Aboriginal cultural heritage and Queensland (non-Indigenous) cultural heritage values. The implementation of CHMPs and a CEMP would ensure adequate management of cultural heritage values by the proponent and the traditional owners as custodians of their cultural heritage.

Detailed evaluation of this topic can be found in section 5.7 of this report.

Other topics

Air quality and greenhouse gases

The project may generate temporary air quality impacts during construction on 11 nearby sensitive receptors, located within 750 m of the project area, including 10 residences and one workplace. Dust emissions associated with vegetation clearing, construction activities and movement of construction vehicles on unpaved roads are expected. The project would also result in greenhouse gas emissions from vegetation clearing, operating plant equipment and vehicles, and use of electricity during construction.

To minimise air quality impacts the proponent has committed to use existing access tracks where possible, minimise haulage distances between construction facilities, minimise excessive ground disturbance during vegetation clearing and construction and undertake dust suppression where necessary. I have made recommendations to the Planning Minister for future MIDs requiring the proponent to implement the commitments and mitigation measures as presented in the EIS, including preparation of an Air Quality (Dust) Management Plan and for air quality monitoring to be undertaken should a landholder complaint be received.

The operation of the transmission line also has the potential to release greenhouse gas emissions due to resistance in the metal wires causing heat, resulting in energy loss in transmission over long distances.

Where lost energy was generated via fossil fuels, this results in greenhouse gas emissions. I have made recommendations to the Planning Minister for future MIDs requiring the proponent to implement the commitments and the mitigation measures in the EIS, including the preparation and implementation of a greenhouse gas offset plan prior to construction commencing.

Detailed evaluation of this topic can be found in section 5.8.2 of this report.

Noise and vibration

The project corridor generally traverses a rural landscape with low levels of background noise. Some areas near the power stations in Mount Isa are currently affected by industrial noise sources and some areas near Cloncurry are affected by noise associated with mining activities. Construction activities may generate noise from long-haul truck movements, helicopters when stringing the transmission lines, operation of plant equipment and vehicles traversing access tracks. The EIS considered potential temporary noise and vibration impacts on 55 nearby sensitive receptors located within 2 km of the project.

To minimise noise and construction impacts the proponent has committed to undertake construction during daylight hours of 6.30 am to 6.30 pm when in proximity to residences, and to consult with landholders to minimise impacts on livestock. I am satisfied the construction noise generated is temporary and the proposed mitigation measures would appropriately minimise noise impacts, specifically to livestock. I have imposed a condition requiring the proponent to consult and report on engagement with landholders in annual reports on implementation of the SIMP (Appendix 1). I have also made recommendations to the Planning Minister for future MIDs regarding noise criteria for the construction camps.

The EIS identified that the operation of the transmission line may generate a crackling sound during light rainfall and humid conditions when rainfall mixes with dust on the transmission line, creating a migrating electricity leakage path. I am satisfied no nearby sensitive receivers would experience noise impacts in this event as they are all located greater than 140 m from the transmission line.

Detailed evaluation of this topic can be found in section 5.8.3 of this report.

Visual amenity

Potential visual amenity impacts of the project are associated with large structures in a variety of landscapes. Selection of the project corridor considered distances from sensitive receptors and nearby towns to minimise these potential impacts.

The proponent has committed to continue to consider visual amenity in determination of final tower heights, tower placement and vegetation screening for substations. I have included a recommendation to the Planning Minister for future MIDs for these proponent commitments to be implemented.

Detailed evaluation of this topic can be found in section 5.8.4 of this report.

Hazard and risk

I am satisfied the EIS included appropriate consideration of potential hazards and risks for the project including worker safety, risks associated with aerial stringing of transmission lines, natural hazards and potential project interactions with contaminated land and unexploded ordinances.

I have included recommendations to the Planning Minister for any future MIDs for the proponent to implement commitments and mitigation measures including a hazard, health and safety management

plan, emergency response plans and procedures (including bushfire and flood), mitigation measures for any contaminated land impacts and consultation regarding avoidance of unexploded ordinances.

Detailed evaluation of this topic can be found in section 5.8.5 of this report.

Waste management

Waste generated by the project is expected to include general construction waste and cleared invasive vegetation. I have recommended that any future MID requests for this project include information on consultation with local councils regarding waste disposal arrangements where use of council facilities has been agreed.

I have included a recommendation to the Planning Minister for future MIDs for the proponent to implement commitments and mitigation measures as presented in the EIS, including for a waste management procedure in the CEMP to detail how project waste would be appropriately stored, transported and disposed.

Detailed evaluation of this topic can be found in section 5.8.6 of this report.

Coordinator-General's conclusion

I have considered the EIS documentation, submissions received and agency advice in evaluating the EIS for the project. I consider that the EIS requirements of the SDPWO Act for the project have been met and that sufficient information has been provided to enable my thorough evaluation of the potential impacts of the project.

The project has the potential to deliver reliable and competitively priced electricity to energy users in North West Queensland by connecting the region to the National Electricity Market, where price and standards of service are governed at the national level. The project is predicted to reduce electricity prices in the North West Power System and has the potential to stimulate investment in the North West Minerals Province, which produces minerals and metals that are critical to the production of renewable energy technologies. Reliable, affordable energy in North West Queensland is predicted to support new mining opportunities and create regional jobs.

The project is also expected to unlock potential areas for renewable energy generation in the Queensland Government's Northern Renewable Energy Zone between Townsville and Hughenden.

I conclude that any adverse environmental impacts can be adequately avoided, minimised, mitigated and/or offset as required through conditions I have imposed and recommendations I have made in this report, and proponent commitments outlined in the EIS.

Accordingly, I recommend that the project proceed, subject to conditions and recommendations included in this report. I expect that the commitments made by the proponent in the EIS will be fully implemented.

In accordance with section 35A of the SDPWO Act, this report will lapse 3 years following the publication date of this report, unless the Coordinator-General sets another date at a future time that extends the report.

A copy of this report will be provided to the proponent, relevant state government agencies and the Commonwealth Minister for the Environment, and will be made publicly available at **www.statedevelopment.qld.gov.au/coordinator-general/copperstring-project**.

.....

Toni Power

Coordinator-General

21 September 2022

1. Introduction

This report has been prepared pursuant to section 34D of the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act) and provides an evaluation of the environmental impact statement (EIS) for the CopperString Project (the project).

It is not intended to record in this report all the matters that were identified and subsequently addressed during the assessment. Rather, it concentrates on the substantive issues identified during the EIS process and the measures and conditions required to address the impacts. The report:

- summarises the key issues associated with the potential impacts of the project on the natural, physical, social and economic environments at the local, regional, state and national levels
- presents an evaluation of the project, based on information contained in the EIS (including the draft EIS and revised draft EIS), submissions made on the EIS during public and advisory agency consultation periods, and information and advice from advisory agencies and the proponent
- recommends and imposes conditions under which the project may proceed
- makes general recommendations
- documents the proponent's commitments.

2. About the project

2.1 The proponent

CuString Pty Ltd (CuString) (ACN: 137 531 054) is the proponent for the project. CuString is an Australian private company based in Townsville, Queensland.

CuString is a registered Intending Participant with the Australian Energy Market Operator and is a special purpose delivery entity created for the CopperString Project.

2.2 Project description

The project involves the construction and operation of approximately 1,000 kilometres (km) of high voltage overhead electricity transmission line that would connect the North West Power System (NWPS) to the state electricity grid.

The project would enable participation in the National Electricity Market (NEM) for electricity consumers along the project corridor, such as mines in the North West Minerals Province (NWMP) and townships. The system would provide connection opportunities for existing and future power generators located in proximity to the project corridor, including renewable generators, to export power into the NEM. The project also provides for improved communications with the installation of fibre optic cables.

The transmission line would run from a new substation at Woodstock, south of Townsville, to a new substation south of Mount Isa. The project as assessed in the EIS also includes a southern extension from Cloncurry south to substations at Selwyn and Woodya. Access to the state electricity grid would be provided through connection to the Powerlink transmission network at a location near Woodstock. An overview of the project alignment is provided in Figure 2.1.

The project traverses 7 local government areas (LGAs); Burdekin, Charters Towers, Flinders, Richmond, McKinlay, Cloncurry and Mount Isa.

The project traverses the traditional lands of the Birriah People, Jangga People #2, Yirendali People Core Country Claim, Wanamara People Core Country Claim, Mitakoodi People #3, Mitakoodi People #5, Kalkadoon People #4 and Yulluna People, Traditional Custodians of the land on which the project is proposed.

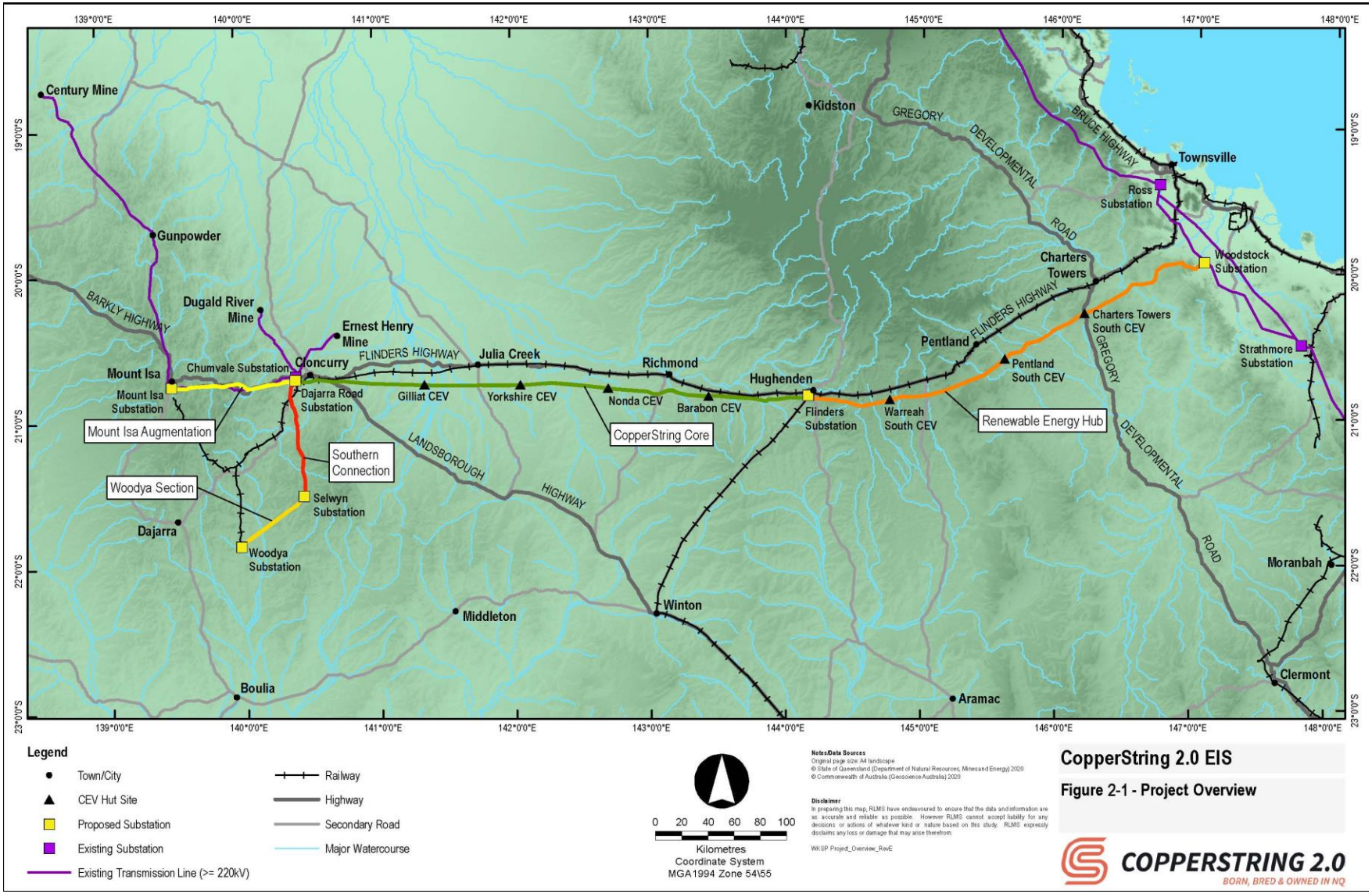

Figure 2.1 Project overview[1]

2.2.1 Potential customers

The EIS states that the project provides an opportunity to stimulate macro-economic growth by reducing electricity prices in the region, which would mostly benefit mining and minerals processing in the NWMP, and by facilitating NEM access to renewable energy resources along the project corridor.

Established large customer electricity consumers connected to the NWPS, which covers Mount Isa, Cloncurry, Capricorn Copper Mine (formerly Gunpowder Mine) and Century Mine, do not have access to the NEM and are currently supplied electricity via bi-lateral agreements between generators and consumers. This system is managed under a Dispatch Protocol authorised by the Australian Competition and Consumer Commission to ensure public benefit through the quality and reliability of electricity supply to the NWMP.

Many of the mines in the NWMP such as Phosphate Hill Mine and Mount Dore Mine generate their own electricity. Electricity generation for the NWPS and isolated mines is mainly fuelled by gas or diesel.

The proponent contends in the EIS that the project would substantially reduce the cost of electricity delivered to the region which is expected to facilitate growth in the resources sector by reducing the cost of mining and minerals processing.

The project is also proposed to pass through the Northern Queensland Renewable Energy Zone (Northern QREZ), stretching between Mackay and Cairns encompassing the northern most extent of Powerlink's transmission network. The project is expected to enable the connection of future renewable energy-based generation to the NEM.

2.2.2 Project sections, construction hubs and work fronts

The project is divided into the following 6 sections.

(1) Woodstock Substation: would connect the project to Powerlink's existing 275 kilovolt (kV) transmission network and would transform voltage between 275 kV and 330 kV.

(2) Renewable Energy Hub: the first 342 km of the project from the Woodstock Substation to the Flinders Substation (south-west of Hughenden) would consist of a double circuit 330 kV transmission line.

This section of the project would include construction of the southern 60 metre (m) side of the proposed 120 m wide easement, leaving the northern side for potential future expansion. Any future expansion would require a separate assessment process.

(3) CopperString Core: the next 395 km of the project to the west would consist of a double circuit 330 kV transmission line and the Dajarra Road Substation (west of Cloncurry). The transmission system would be designed to deliver 500 megavolt amperes (MVA) of electricity to the CopperString Core.

This section of the project would include construction on the southern 60 m side of the proposed 120 m wide easement, leaving the northern side for potential future expansion. Any future expansion would require a separate assessment process.

The CopperString Core would connect to the existing NWPS 220 kV network at Cloncurry. The Dajarra Road Substation would transform the voltage between 330 kV and 220 kV (the NWPS transmission voltage); the existing NWPS would then be used for transmission, through the Chumvale Substation, for Dugald River Mine, Ernest Henry Mine, and the Southern Connection

(4) Mount Isa Augmentation: would consist of a new substation south of Mount Isa, near the Mica Creek Complex, approximately 99 km of double circuit 220 kV transmission line connecting to the

Dajarra Road Substation. The Mount Isa Augmentation would upgrade and supplement the transfer capacity between the Chumvale Substation and the Mica Creek Complex. A 60 m easement is proposed for this section.

(5) Southern Connection: approximately 90 km of double circuit 220 kV transmission line that would connect the Dajarra Road Substation to the Selwyn Substation. The Southern Connection would enable connection for mines such as Mount Dore Mine and Phosphate Hill Mine that are presently not connected to the NWPS. The Selwyn Substation would include distribution equipment to connect the Mount Dore Mine. A 60 m easement is proposed for this section.

(6) Woodya Connection: would consist of the Woodya Substation and a double circuit 220 kV transmission line, energised to 132 kV, approximately 61 km long that would connect to the Southern Connection at the Selwyn substation. The Woodya Substation would then include distribution equipment to connect the Phosphate Hill Mine. A 60 m easement is proposed for this section.

The sections of the project, including proposed easement widths, are summarised in Table 2.1.

Table 2.1 Project sections

Project section	Approximate distance (km)	Voltage (kV)	Easement width (m)
Woodstock Substation to connect to the existing Powerlink network	-	-	-
Renewable Energy Hub, including:	342	330	120
• *Mulgrave cut-in (north)*	*0.98*	*275*	*60*
• *Mulgrave cut-in (south)*	*1.07*	*275*	*60*
CopperString Core, including:	395	330	120
• *Dajarra Road Connection for connection to Ernest Henry and Chumvale Substations*	*4*	*220*	*60*
• *Dajarra Road Connection for connection to Dugald River Mine*	*3*	*220*	*80*
Mount Isa Augmentation	99	220	60
Southern Connection	90	220	60
Woodya Connection	61	220 (energised to 132 kV)	60

Further to the above sections, the proponent has divided the project into 9 construction hubs for planning construction activities and delivery of the project.[2] These are Charters Towers, Cloncurry, Hughenden, Julia Creek, Pentland, Richmond, Selwyn, Mount Isa and Woodstock or Ayr. The construction hubs would each be serviced by a central camp or existing accommodation and project office. All hubs will support transmission line construction activities, and some will also support substation construction activities.

Construction will be undertaken by up to 2 work fronts for each construction hub, with the work fronts moving from one construction hub to another upon completion of works. Each work front will consist of several small teams each focusing on a specific activity – vegetation clearing and access, foundation

[2] Construction hubs as identified in Figure 2-6 of the updated Project Description available via: https://eisdocs.dsdip.qld.gov.au/CopperString/2022/Final%20EIS/Attachment%20B%20-%20Revised%20Project%20Description.PDF.

establishment, installing steelwork for transmission towers, stringing of transmission line or rehabilitation activities.

2.2.3 Project components

The project comprises the following components:

- transmission towers
- transmission lines
- substations
- control and communications systems
- construction facilities
- access tracks
- construction camps.

The project area is defined as the area on which the project components are proposed within the project corridor.

2.2.3.1 Transmission towers

The exact, final location and parameters for each individual tower has not been defined in the EIS. Instead, general specifications for transmission tower design and location were described.

Transmission tower design is based on a steel lattice construction, although alternative structures such as monopoles may be considered, to minimise impacts of the construction footprint. The Renewable Energy Hub and CopperString Core sections would have double circuit 330 kV transmission lines. Typical structures are shown in Figure 2.2. Each transmission tower would support a single circuit on each side of the tower.

Figure 2.2 Typical 330 kV double circuit steel lattice transmission tower (left) and typical 330 kV double circuit monopole (right)[3]

The Mount Isa Augmentation and the Southern Connection would each have a double circuit 220 kV transmission line. The Woodya Connection would a double circuit 220 kV transmission line, energised to 132 kV. Each double circuit transmission structure would support a single circuit on each side of the tower. The connections between Dajarra Road Substation and the Chumvale Substation area will have three 220 kV single circuit transmission lines. Typical single circuit structures, with a single overhead earth wire, are shown in Figure 2.3.

Each transmission line circuit would consist of three-phase conductors (or possibly groups of sub-conductors) and an optical ground wire (OPGW). The OPGW would consist of a fibre optic cable shielded by a conductor and would function as both lightning protection and to transmit communications.

[3] From the project EIS, Volume 4. Updated version provided by proponent for this report.

Figure 2.3 Typical 220 kV single circuit lattice transmission tower (left) and typical 220 kV single circuit monopole structure (right)[4]

Transmission towers would be designed to maintain a clearance of the transmission line above local terrain in compliance with Queensland legislation and national guidelines. Transmission tower heights would vary from location to location, between 45 m up to 75 m, depending on the topography of each specific tower location. The distance between transmission towers would typically be in the range of 500–600 m. This may vary depending on the topography and conductor clearance distance required for the easement.

Concept transmission tower sites were identified in the EIS to provide examples of how the general specifications for transmission tower design and location would be applied to sites, and impacts were assessed for these along the project corridor. The concept transmission tower sites were selected in consideration of physical constraints such as sensitive environmental areas, rock/soil types, significant waterways and watercourse infrastructure crossings, existing land use and amenity. It is proposed for the transmission towers to be sited to make the best use of available terrain whilst minimising impacts to the environment and adjacent land uses. Transmission towers and associated construction materials would be located outside of active watercourses and wetlands

Where the project corridor crosses large channel river systems (braided ephemeral systems), the EIS provided detail of the exact location and parameters for individual tower sites. In these circumstances the

[4] From the project EIS, Volume 4. Updated version provided by proponent for this report.

tower sites have been individually selected to avoid existing channels and the tower design would be sufficient to withstand seasonal flows or larger flooding events.

The type of foundation for the transmission towers proposed would largely depend on the site and its soil condition. Detailed geotechnical studies would be conducted during the detailed design phase of the project to finalise foundation types. There are a range of potential footing types and designs would vary, depending on the final transmission tower size, transmission tower type and site conditions for each location, although it is anticipated that most would be bored concrete piers. Where monopoles are used there would be a single foundation, rather than 4 separate footings.

Tower structure type, height and size would be confirmed during the detailed design phase of the project, following this EIS process.

2.2.3.2 Transmission lines

Transmission line construction would require vegetation clearing within the operational clearance boundary (which must remain cleared of vegetation for safety during construction and operation) and the construction of access tracks. Helicopters would be used as the primary means of installing transmission lines. Brake and winch sites for tensioning the transmission lines would be required every 5 to 10 km along the transmission line during construction and would be primarily located within the final transmission line easement. The transmission line easement is the land area to be secured for the delivery of the project within the project corridor assessed in the EIS. An easement is the right to enter or use a section of land for a particular purpose by someone who is not the land owner. The proponent is responsible for securing the required easements for the project to proceed, and has committed to reach voluntary, commercial agreements with landowners as far as possible.

2.2.3.3 Substations

New substations would be required at Woodstock, Flinders (south-west of Hughenden), Dajarra Road (west of Cloncurry), south of Mount Isa, Selwyn and Woodya (as identified in Figure 2.1).

Substations are required to perform switching, voltage transformation, stability control through reactive and system strength support, connect to the customer, and to enable connection for future renewable energy-based generators or Powerlink systems.

Substation equipment would include:

- security fences to restrict unauthorised access to the site
- a 5 m wide gravel access road and space for parking
- bitumen internal roads within the substation
- drainage works to collect and channel water into drainage pits
- major electrical equipment and switchgear
- a fire protection system
- a small maintenance facility that would include an office, amenities and a hardstand for the loading and unloading of materials.

2.2.3.4 Control and communications systems

Control and communications buildings that are proposed to be constructed at each substation site would house the supervisory control and data acquisition (SCADA) system which would communicate with the control centre to ensure 24-hour monitoring of the network.

In addition to the communications buildings at each substation, OPGW repeater stations would be required at sites along the transmission network to boost the optical signal, and would be located at a spacing of 80 to 120 km, close to the transmission line. The fibre optic cable within the OPGW is proposed to strengthen communications services along the project alignment.

The main component of OPGW repeater stations would be a hut housing the Controlled Environmental Vault (CEV), a temperature and humidity controlled room suitable for co-location of telecommunications equipment. Equipment within the CEV huts would be battery-powered and charged by mains electricity or solar power.

The CEV huts would be prefabricated and mounted on concrete piers inside a fenced area located on the northern side of the corridor outside of and adjacent to the easement.

2.2.3.5 Construction facilities

Construction facilities would include laydown/delivery areas and concrete batching plants. The proponent has made a commitment to finalise the locations of the construction facilities during the detailed design phase of the project.

Approximately 2 laydown/delivery areas are proposed for each of the construction hubs. The laydown/delivery areas are proposed to be located either adjacent to the camps or substations and would be approximately 6.25 hectares (ha) in size when associated with the transmission line, and 25 ha in size for the substations. Laydown/delivery areas are expected to be located along the transmission line construction route. The proponent will consider during detailed design whether any freight associated with the project can be delivered via the existing rail system. If use of rail freight is pursued, co-location of project laydown areas with existing rail sidings would be considered. Each laydown/delivery area would have a construction site office in the form of a demountable hut.

Construction material and plant equipment would be delivered by truck and stored at the laydown/delivery areas. Transmission tower steel bundles would be partially pre-assembled at the laydown/delivery areas and then grouped into transmission tower lots for delivery.

Concrete batching plants would be required for the supply of concrete for foundations. Existing operational batching plants would be used where possible, and new batching plants established next to operating batching plants in major locations. If required, new mobile batching plants would be constructed adjacent to the laydown/delivery areas for construction hubs. At the completion of the construction program, all construction facilities would be dismantled, removed and dispersed. The proponent has committed to rehabilitate these cleared areas at the completion of construction.

2.2.3.6 Access tracks

Access to the transmission line and tower sites would be required for both construction and ongoing maintenance.

It is proposed for tracks to generally be contained within the transmission line easement; however, they may be located outside of the transmission line easement, to avoid physical constraints such as terrain and environmentally sensitive areas. Where possible, the proponent intends to use the existing road network and private access tracks; however, many new access tracks would be required to provide access for construction and maintenance teams.

Tracks would generally be unsealed and would follow natural ground contours. They would be 6 m wide during construction with vehicle passing bays accommodated within line of sight, to allow the safe movement of construction and maintenance equipment and vehicles.

A schematic view of typical tower assembly and construction access with allowance for passing bays is shown in Figure 2.4. Following completion of construction, access tracks would be partially rehabilitated, retaining a 3 m wide track for operational and maintenance access.

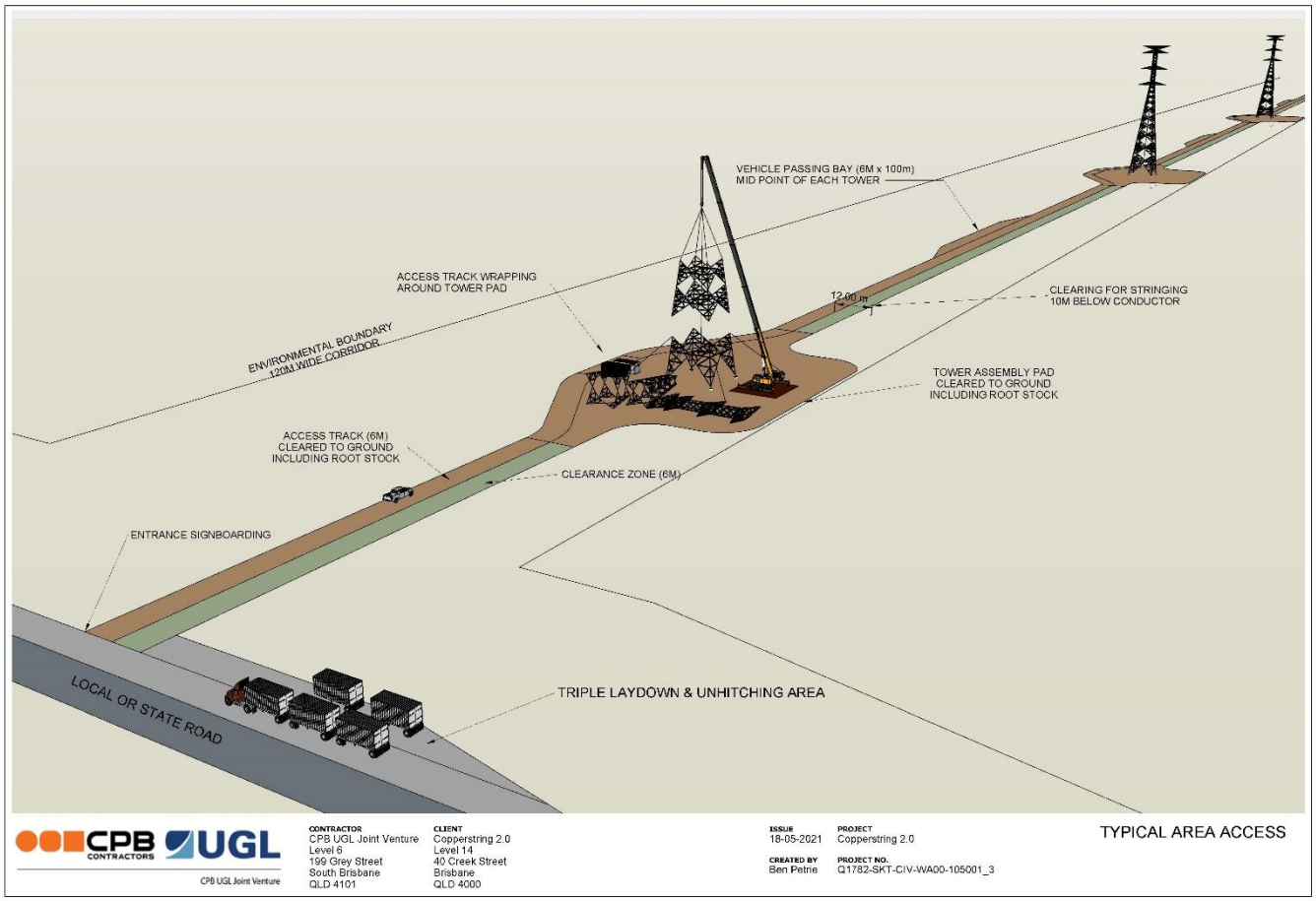

Figure 2.4 Typical tower assembly and construction access[5]

2.2.3.7 Construction camps

Dedicated construction camps would be required at 7 of the construction hubs: Charters Towers, Cloncurry, Hughenden, Julia Creek, Pentland, Richmond and Selwyn. It is proposed for workers at the Mount Isa and Woodstock or Ayr construction hubs to use existing local accommodation.

It is proposed for construction camps to be located near the towns and would comprise of demountable accommodation units housing up to 350 workers. The camps would be used by both the substation construction workforce and the transmission line construction workforce. Construction camps would be decommissioned at the end of the construction program. The proponent continues to engage with local governments regarding the final location, configuration and servicing for each camp.

2.2.4 Project development stages

The project involves pre-construction, construction, de-commissioning of construction facilities, commissioning of infrastructure and operation stages. Activities associated with each stage are described below.

[5] From the project EIS, Volume 4.

2.2.4.1 Pre-construction

Pre-construction includes:

- finalisation of the detailed design for the project
- geotechnical, property and other surveys for the easement, transmission towers and substations
- acquiring development approvals, licences, permits and native title/cultural heritage clearances
- securing land use agreements with landholders for easements to locate transmission lines, substations and CEV huts
- construction and commissioning of temporary construction camps, comprising demountable accommodation units housing up to 350 workers and site offices
- workforce sourcing, induction and construction team mobilisation
- procurement of construction materials and preparation for transportation of materials to the project location.

2.2.4.2 Construction

Construction is proposed to be segmented into the 9 construction hubs at Charters Towers, Cloncurry, Hughenden, Julia Creek, Pentland, Richmond, Selwyn, Mount Isa, and either Woodstock or Ayr.[6]

Transmission line and tower construction would require:

- vegetation clearing to establish an easement between 60 m and 120 m wide, and access roads where proposed to be located outside of the easement
- establishment of access tracks and supporting construction facilities (including laydown/delivery areas and concrete batching plants - either to be located adjacent to operating batching plants in major locations as well as new mobile batching plants adjacent to laydown/delivery areas)
- establishment of concrete foundations for transmission towers and concrete piers for CEV huts
- establishment of brake and winch sites for tensioning of the transmission lines
- assembly of transmission towers using small cranes to piece together sections and attach transmission line hardware at ground level, and a larger crane to erect the tower
- stringing the transmission line and earth wires to the transmission towers via helicopter
- establishment of OPGW repeater stations, including CEV huts and fencing to restrict unauthorised access
- transmission tower completion works (e.g. signage) and rehabilitation of disturbed areas not required for remaining access tracks or maintenance areas.

Substation construction would require:

- vegetation clearing for the substation area, including an access road and parking area
- civil works and drainage for site preparation
- establishment of site fencing to restrict unauthorised access

[6] Hubs as identified in Figure 2-6 of the updated Project Description available at: https://eisdocs.dsdip.qld.gov.au/CopperString/2022/Final%20EIS/Attachment%20B%20-%20Revised%20Project%20Description.PDF.

- establishment of a 5 m wide gravel access road and parking area, and bitumen internal roads
- establishment of concrete foundations for substations and communications buildings
- establishment of supporting construction and maintenance facilities (including office, amenities and laydown areas)
- construction of substation and control and communications buildings
- equipment installation including major electrical equipment and switch gear and fire protection system
- rehabilitation. of disturbed areas.

As discussed in section 2.2.2, transmission line construction would be undertaken by up to 2 work fronts comprising small teams with defined responsibilities, which would move from one construction hub to another upon completion of the works.

2.2.4.3 Decommissioning of construction facilities

At the completion of the construction stage, all facilities associated with the temporary construction camps, laydown areas and any onsite works would be dismantled and removed.

Rehabilitation of temporary construction areas would occur progressively, as construction works are completed.

2.2.4.4 Commissioning and operations

The project would be subject to a detailed testing and commissioning plan and several performance trials to verify the integrity of the transmission lines and substation infrastructure. Once verified, the project would commence operations.

The design life of the project is expected to be 45 years, however ongoing, regular maintenance would be required throughout its operational life. The EIS indicated that any infrastructure components with a design life of less than 45 years would require replacement to maintain reliability of supply (e.g. transformer oil refurbishment/replacement required every 10 to 20 years). During operations, access tracks and vegetation clearing would be maintained for ongoing maintenance of project infrastructure.

2.2.5 Dependencies and relationships with other projects

2.2.5.1 Project History

The proponent, CuString, is the same entity that proposed the previous CopperString Project, which was declared as a 'significant project' in 2010, with a draft EIS publicly notified in December 2010 and a supplementary EIS publicly notified in September 2011. The significant project declaration was repealed on 25 September 2012, following advice from the proponent that it had decided, at that time, not to pursue the declared project.[7]

Prior to repeal of the significant project declaration, the previous CopperString Project was also declared an 'infrastructure facility of significance' (IFS), under the SDPWO Act. Under former section 125 (1)(f) of the SDPWO Act, a project's declaration as an IFS gave the Coordinator-General the ability to acquire land for an infrastructure facility. While amendments to the SDPWO Act, that took effect in December 2012, replaced the 'IFS' provisions with a new 'private infrastructure facility' acquisition, the existing IFS

[7] https://www.statedevelopment.qld.gov.au/coordinator-general/assessments-and-approvals/coordinated-projects/projects-discontinued-or-on-hold/copperstring-project.

designation has not been repealed.[8] The proponent does not propose acquisition of land associated with this IFS designation, and no designation of a 'private infrastructure facility' has been sought.

The proponent re-established a project team for the current project in the second half of 2017 in response to the Queensland Government's announcement of the North Queensland Clean Energy Hub; an initiative to develop strategic electricity transmission infrastructure to support renewable energy transmission from significant wind and solar resources in north Queensland.

In April 2019, the current project was declared a coordinated project under the SDPWO Act. More detail on the complete EIS process is provided in Chapter 3.

2.2.5.2 Relationship to other projects

The project would connect the NWPS and foundation customers at geographically isolated mine sites along the project corridor to the state electricity grid, allowing participation in the NEM.

The first 342 km of the project (known as the 'Renewable Energy Hub') would pass through the Northern QREZ.[9] The Flinders Substation to be constructed south-west of Hughenden as part of the project, would be able to facilitate NEM participation of future renewable energy-based generation projects currently constrained by the lack of access to the NEM.

The next 395 km of the project ('CopperString Core') would enable connections to the Ergon Energy Chumvale Substation and nearby mines, and enable existing generators in the NWPS to connect with and provide supply to the NEM.

The Mount Isa Augmentation would upgrade and supplement the transfer capacity between the Chumvale Substation and the Mica Creek Complex at Mount Isa with the potential to supply new mine sites.

A proposed Southern Connection would enable connection of the southern mines that are not connected to the NWPS.

Other major projects in the regions traversed by the project are shown in Figure 2.5.

[8] **https://www.statedevelopment.qld.gov.au/coordinator-general/assessments-and-approvals/private-infrastructure-facilities/infrastructure-facilities-of-significance**
[9] Northern Queensland Renewable Energy Zones fact sheet, available via: **https://www.epw.qld.gov.au/__data/assets/pdf_file/0025/17449/Northern-QREZ-factsheet.pdf**.

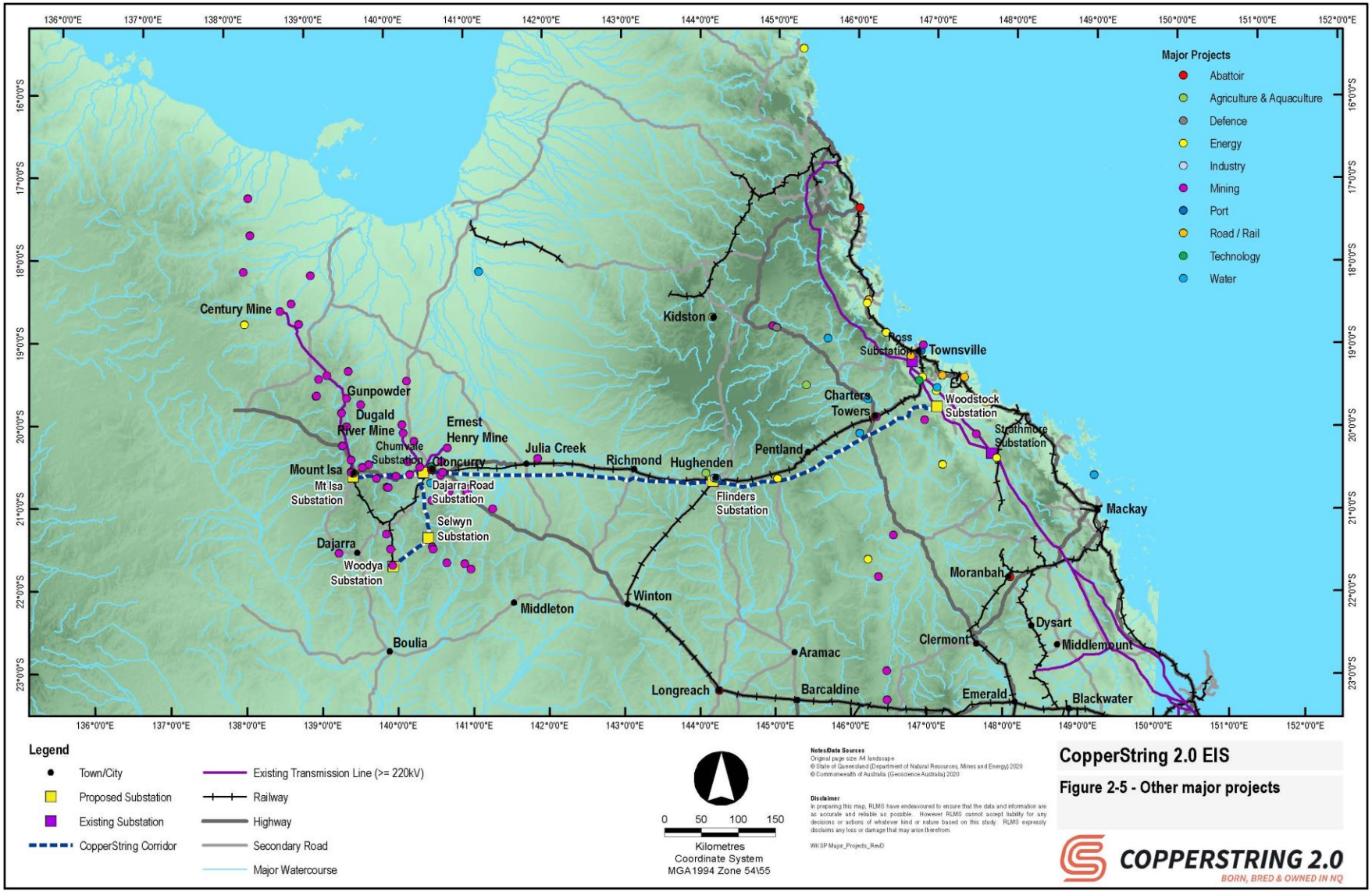

Figure 2.5 Other major projects in the broader project region[10]

2.3 Project rationale

The NWMP is a vital contributor to the Queensland economy, supplying new economy minerals for the growing global technological sector and for components required for renewable energy generation.[11]

Reliable, affordable energy in the North West is predicted to unlock new mining opportunities and create regional jobs.

The project EIS argues that current energy prices (electricity and gas) in the NWPS are high by national and international standards and supply options are limited. The EIS states that access to competitively priced electricity, through a transmission network with the capacity to both import and export electricity, would significantly contribute to the economic development of the region.

International prices for energy, both wholesale gas and electricity, are currently high driven by international market volatility and gas supply shortages for the European market, which is also impacting domestic gas and electricity prices. The EIS states that the project is predicted to reduce electricity prices in the NWPS and has the potential to stimulate investment in the NWMP, which produces minerals and metals that are critical to the production of renewable energy technologies.

The project traverses a region of significant potential renewable energy resources that are currently constrained by the lack of access to the state electricity grid. Connection to the state electricity grid and participation in the NEM is expected to support the economic feasibility and ultimate development of renewable generation in the region, especially in the Northern QREZ between Townsville and Hughenden (particularly wind resources) and the NWMP.

The EIS states that the project would generate significant community benefits with direct employment opportunities as part of the construction and operation phases. It is anticipated that 750 full time equivalent (FTE) jobs would be created during the project's construction phase with 30 ongoing FTE jobs required to operate and maintain infrastructure. There is also the potential for indirect employment opportunities through the subsequent expansion of the mining and renewables sectors.

Section 5.5 of this report evaluates the economic benefits and impacts predicted for the project that have been stated in the EIS.

The EIS states that the project is anticipated to have lasting positive economic, social and community benefits by enabling economic development through the provision of reliable and contestable electricity throughout the region

2.3.1 Government policy and project development funding

There has been project development support provided by Queensland and Australian governments. In 2009, the then Australian Government identified the extension of the NEM to the NWMP as a national infrastructure priority in the report *National Infrastructure Priorities: Infrastructure for an economically, socially, and environmentally sustainable future*.[12] The Australian Government further identified the need for additional electricity infrastructure in northern Australia in 2015 through the *Our North Our Future White Paper on Developing Northern Australia*.[13]

---

[11] Department of State Development, Manufacturing, Infrastructure and Planning (2019) *North West Queensland Economic Diversification Strategy 2019*, accessed July 2022 at: **https://www.statedevelopment.qld.gov.au/__data/assets/pdf_file/0015/33306/nw-qld-economic-diversification-strategy.pdf** and State of Queensland (2020) *New Economy Minerals: Investment Opportunities in Queensland's Minerals Provinces,* accessed at: **https://www.statedevelopment.qld.gov.au/__data/assets/pdf_file/0028/64558/new-economy-minerals-investment-opportunities-in-queenslands-minerals-province.pdf**

[12] **https://www.infrastructureaustralia.gov.au/sites/default/files/2019-06/National_Infrastructure_Priorities.pdf**.

[13] **https://www.infrastructure.gov.au/sites/default/files/documents/nawp-whitepapersummary.pdf**.

Funding was provided by the former Australian Government, with $4.7 million provided in the 2018-19 Mid-Year Economic and Fiscal Outlook to support development of the project. In July 2019, the Northern Australia Infrastructure Fund (NAIF) announced the project's request for funding had progressed to the due diligence phase of its assessment. In January 2021, the former Australian Government announced an additional $11 million to help progress the project to a final investment decision.

The Queensland Government has supported project development and provided direct funding as well as supporting ongoing development of the North West Queensland region. Table 2.2 identifies the Queensland Government plans and publications relevant to the project.

The project has been supported by $15.98 million of Queensland Government grant funding including a grant as part of the State Government's May 2020 Queensland's Economic Recovery Strategy. In addition, in October 2020 the State Government signed an Implementation Agreement with the proponent. Under the Implementation Agreement, the Queensland Government would underwrite additional development costs, through to a final investment decision.

Table 2.2 Queensland government plans of publications relevant to the project

Date	Development plan or publication
Mid-to-late-1990s	Northwest Queensland Development Initiative
2007	Northern Economic Triangle Infrastructure Plan (NET Infrastructure Plan)
2007	NET Infrastructure Plan Progress Report (progressing priority actions)
2009	Review of North West Queensland Energy Delivery (the Sims Review)
2010-2013	North West Regional Plan
November 2015	North West Minerals Province Taskforce
June 2016	Advancing North Queensland: Investing in the future of the north
June 2017	Powering Queensland Plan: an integrated energy strategy for the state, including the Powering North Queensland Plan
July 2017	Strategic Blueprint for Queensland's North West Minerals Province
May 2020	Queensland's Economic Recovery Strategy: Unite and Recover for Queensland Jobs, including provision for development of the Northern QREZ
June 2022	Queensland resources industry development plan

In December 2021 the Queensland Government released a Consultation Regulatory Impact Statement (RIS) for electricity supply options for the NWMP. The RIS considered three options:

- business as usual – this involves new supply arrangements as market demand requires
- CopperString 2.0 (National Energy Market Connection) – this is the project assessed in the EIS and requires legislative change, NEM rule changes and cost sharing across the national energy market
- NEM Connection – this involves the CopperString Project legislative change without the need to change the NEM rules.

The RIS was open for public consultation until 28 February 2022. The Queensland Government is currently reviewing the responses to this public consultation and considering the appropriate outcome.

2.3.2 Corridor selection

The EIS included a Corridor Selection Report. This report identified a baseline investigation corridor for the transmission line from Woodstock through to Mount Isa and from Cloncurry south to the Selwyn Substation with connection points to Mount Dore Mine and Phosphate Hill Mine.

The project's previous 2010 route selection report was the initial basis for selecting the proposed transmission line corridor. The methodology for the 2010 route selection was re-visited to reconfirm critical project assumptions and criteria. The analysis confirmed that the 5 km wide 2010 route remained the preferred route, noting that the preferred corridor to the south of the Flinders Highway as most appropriate due to:

- avoidance of White Mountain National Park
- increased flood risk north of the Flinders Highway between Hughenden and Mount Isa
- being a more direct route, reducing environmental impacts and capital costs.

The corridor selection process undertaken for the project EIS involved multi-disciplinary reviews and consultations with landholders and stakeholders. Consultation undertaken guided refinement of the 5 km wide study corridor down to the preferred 60 m – 120 m wide project corridor. Several amendments were made in response to consultation to avoid impacts to environmentally sensitive areas, cultural heritage areas, consideration of landholder requests and engineering considerations.

The EIS investigated several alternative alignments through the Ballara Nature Refuge. This investigation, and an evaluation of the potential impacts on the Ballara Nature Refuge from the preferred alignment, are evaluated in section 5.2.8 of this report. The preferred alignment reduces the distance the corridor extends through the refuge as much as possible, while also avoiding steep land and rugged terrain located on the eastern side of Cloncurry-Dajarra Road and the Mount Isa rail line.

3. Environmental impact statement assessment process

In undertaking this evaluation, the following matters have been considered:

- the initial advice statement
- the EIS documentation and technical reports, including the draft EIS and the revised draft EIS
- issues raised in submissions on the EIS
- advice from the following State Government agencies:
  - Department of Agriculture and Fisheries
  - Department of Education
  - Department of Employment, Small Business and Training
  - Department of Energy and Public Works
  - Department of Environment and Science
  - Department of Regional Development, Manufacturing and Water
  - Department of Resources
  - Department of State Development, Infrastructure, Local Government and Planning
  - Department of Transport and Main Roads
  - Queensland Ambulance Service
  - Queensland Health
  - Queensland Police Service
  - Queensland Treasury
- advice from the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW), formerly the Australian Government Department of Agriculture, Water and the Environment (DAWE)
- advice from the following local governments:
  - Richmond Shire Council
  - Flinders Shire Council
  - Charters Towers Regional Council
  - Townsville City Council

  Note: through the EIS process all local governments along the project corridor were invited to provide comment on the EIS.
- additional information and advice from the proponent as requested during evaluation of the project EIS.

The stages of the project's EIS are documented on the project's webpage at:
https://www.statedevelopment.qld.gov.au/coordinator-general/copperstring-project

3.1 Coordinated project declaration

On 26 April 2019, the Coordinator-General declared the project to be a 'coordinated project' under section 26(1)(a) of the SDPWO Act. This declaration initiated the statutory environmental impact evaluation procedure of Part 4 of the SDPWO Act, which required the proponent to prepare an EIS for the project.

3.2 Australian Government assessment

On 14 May 2019, the then Commonwealth Minister for the Environment determined that the project is a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act), reference EPBC 2019/8416. The relevant controlling provisions for the project under the EPBC Act are:

- listed threatened species and communities (sections 18 and 18A)
- listed migratory species (section 20 and 20A).

The then Commonwealth Minister for the Environment also determined that the project should be assessed under the Queensland Assessment Bilateral Agreement (the Bilateral Agreement). Under the Bilateral Agreement (made under section 45 of the EPBC Act), if a controlled action is a 'coordinated project for which an EIS is required' under the SDPWO Act, certain types of projects do not require assessment under Part 8 of the EPBC Act. The Bilateral Agreement enables the EIS to meet the impact assessment requirements of both Commonwealth and Queensland legislation.

Chapter 6 of this report provides an assessment of matters of national environmental significance (MNES), lists each controlling provision under the EPBC Act and explains the extent to which the Queensland Government's EIS process addresses the actual or likely impacts of the project on the matters covered by each controlling provision. Appendix 3 of this report recommends conditions for the Commonwealth Minister for the Environment to consider in making a decision on the project under the EPBC Act.

The assessment and recommended conditions are consistent with the Bilateral Agreement.

3.3 Terms of reference

The draft terms of reference (TOR) for the EIS for the project were released for public and advisory agency comments from 8 July 2019 to 2 August 2019. Comments were received from 22 submitters, including advisory agencies, local governments, interest groups and resource companies.

The final TOR were prepared, having regard to comments received, and issued to the proponent on 4 September 2019.

3.4 Review of the draft EIS

The complete draft EIS, prepared by the proponent, was provided to the Office of the Coordinator-General on 20 November 2020 and was released for public and agency comment from 21 December 2020 to 12 February 2021.

A total of 28 submissions were received on the draft EIS comprising 12 from state advisory agencies, 4 from local governments, one from the former DAWE, 5 from private submitters and 6 from organisations.

The key issues raised in advisory agency submissions on the draft EIS included:

- impacts to the Ballara Nature Refuge, located to the south and south-west of Cloncurry
- limited detail on the location of clearing for project activities, to determine total vegetation loss, habitat impacts and potential offsets
- limited information of project impacts on listed threatened and migratory species
- insufficient information of project impacts on the state transport network, including railway corridors and proposed mitigation works
- insufficient information regarding impacts to water quality of traversed waterways and flood regimes.

Key issues raised by organisations and private submitters:

- insufficient information regarding impacts to soil loss, soil salinity and existing grazing and property management activities
- limited information on impacts to land, geology and soils, water resources, water quality, air quality, greenhouse gases, noise, vibration, social and cultural heritage
- the need to consider a change to the corridor alignment due to the proximity of the proposed transmission infrastructure to planned open-cut mining pits
- limited information provided about the economic benefits of the project, about reductions in energy costs for users in the NWPS and the potential impacts on other electricity users.

3.5 Additional information to the EIS

On 17 June 2021, the proponent was requested to submit additional information to the EIS to provide:

- a response to issues raised in submissions on the draft EIS
- clarification of predicted impacts to the Ballara Nature Refuge and proposed mitigation and management measures
- detailed clearing and impact areas to inform assessment of potential impacts on listed threatened species and communities and high value habitat areas (including MNES)
- a biodiversity offset strategy, reflecting the detail of proposed clearing for project activities and impact areas
- project interaction with the state road network and further assessment on road and traffic impacts
- further detail on predicted water quality impacts and assessment of flood risks
- relevant approvals required and the preferred approval pathway for the project
- revised environmental management plans for construction and operation, to include mitigation and management measures
- updates to the project description in response to submissions and project refinements (e.g. mining interests, property management concerns), and an updated and consolidated proponent commitment register
- further detail on demand for the project and potential economic impacts of the project.

The proponent prepared a revised draft EIS in response to the request for additional information. This was provided to submitters on the draft EIS, including advisory agencies, for review and comment during October and November 2021.

Further comments were received from 10 submitters, including 6 state advisory agencies, the former DAWE, one local government and 2 organisations. All submissions made on the draft EIS and the revised draft EIS have been considered in this evaluation report. In addition, comments from an additional private stakeholder were received during February 2022 which are considered in this report.

On 12 January 2022, the proponent lodged an update to the revised draft EIS, including responses to further submitter and agency comments.

On 28 February 2022, the Coordinator-General accepted the draft EIS, together with the revised draft EIS, as the final EIS. This documentation is referred to in this report collectively as ‘the EIS’.

4. Project approvals

Following the release of this evaluation report, the proponent will need to obtain statutory development approvals from Australian, state and local government agencies before the project can proceed. Table 4.1 provides a list of key approvals required for the project, for some of which this evaluation report includes recommended conditions.

The proponent proposes to utilise option agreements for the purposes of acquiring easement rights. These agreements and associated commercial negotiations are to be progressed by the proponent outside of this EIS process, and as such are not considered in this report.

Table 4.1 Key approvals required for the project to proceed

Project components	Permit/approvals	Legislation	Assessment Manager/lead agency
Australian Government			
Whole of project	Decision on taking the action for the purposes of the following controlling provisions (EPBC ref. 2019/8416) • listed threatened species and communities (sections 18 & 18A) • listed migratory species (sections 20 & 20A	*Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)	DCCEEW
State Government			
Whole of project	Ministerial Infrastructure Designation (MID)	*Planning Act 2016* (Planning Act) and Planning Regulation 2017 (Planning Regulation)	Planning Minister, Department of State Development, Infrastructure, Local Government and Planning (DSDILGP)
Whole of project	Cultural Heritage Management Plan (an agreement between a land user and Traditional Owners)	*Aboriginal Cultural Heritage Act 2003* (ACH Act) (Part 7)	Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships
Clearing vegetation for the project (if not included in a MID)	Development permit for operational works – vegetation clearing	*Vegetation Management Act 1999* (VM Act)	Department of Resources/ State Assessment Referral Agency (SARA)
Construction activities (access tracks / crossing of waterways) (if not included in a MID)	Development permit for operational works – works involving constructing or raising waterway barrier works	Planning Act and Planning Regulation, *Fisheries Act 1994* (Fisheries Act)	SARA Department of Agriculture and Fisheries (DAF)
Clearing protected plants for the project	Protected plant clearing permit or exemption clearing notification	*Nature Conservation Act 1992* (NC Act)	Department of Environment and Science (DES)

Project components	Permit/approvals	Legislation	Assessment Manager/lead agency
Sewage treatment works (construction camps) (if not included in a MID)	Development permit for material change of use (MCU) – environmentally relevant activity (ERA) (sewage treatment works ERA 63)	*Environmental Protection Act 1994* (EP Act)	DES/SARA
Local Government – Development permits for project components not included in a MID process			
Development approval for project components	Development permit for MCU for project components (e.g. construction facilities)	Planning Act and Planning Regulation, EP Act	Local government/ DSDILGP/ SARA
Development approval for bulk earthworks	Development permit for operational works for bulk earthworks associated with project infrastructure and access tracks	Planning Act and Planning Regulation, EP Act	Local government/ DSDILGP/ SARA
Local Government			
Plumbing and drainage works associated with camps	Plumbing and drainage approvals	*Plumbing and Drainage Act 2018*	Contractor
Building works	Development permit for building works	*Building Act 1975,* Building Regulation 2021	Building certifier

4.1 Australian Government approvals

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

As discussed in Chapter 6, this report provides an assessment of MNES, consistent with the Bilateral Agreement.

After a copy of this report is provided to the Australian Government, a decision on the controlled action under section 133 of the EPBC Act will be made by the Commonwealth Minister for the Environment or the delegate. The Commonwealth Minister for the Environment will use the information in Chapter 6 to decide whether the project should proceed, and if so, whether any additional conditions, beyond those recommended in this report, would be applied to manage the impacts on MNES.

4.2 State Government approvals

4.2.1 Ministerial Infrastructure Designation

A MID allows for the delivery of essential community infrastructure. This provides an alternative process to lodging a development application with the relevant local government/s. The Planning Minister makes all decisions relating to MID requests, while the DSDILGP coordinates the assessment process, including obtaining assessment advice from other state agencies and technical experts.

The proponent has indicated an intention to seek a MID under the provisions of the Planning Act. An approved MID doesn't directly authorise development, instead it makes specified work 'accepted development' under the Planning Act, i.e. development that does not require a development approval.

The proponent considers the MID process the most appropriate pathway due to the long linear nature of the project and simplification of approval requirements spanning multiple LGAs. The MID process would address all development permits assessable under the Planning Regulation, likely to include an MCU under the relevant local planning schemes (code or impact assessable), building works, reconfiguration of a lot and operational works including excavating or filling that materially affects a premise or its use (bulk earthworks, roadworks), and clearing vegetation. Other specific approvals/permits required under other legislation would be obtained separately.

It is expected that the MID process would be broken into multiple MID proposals generally in accordance with the proposed 9 construction hubs presented in the EIS.

This report includes recommended conditions for the Planning Minister's consideration of MID proposals.

4.2.2 Planning Act 2016

The Planning Act is the principal planning legislation administered by the Queensland Government and seeks to establish an efficient, integrated and coordinated system of land use planning, development assessment and related matters that facilitates the achievement of ecological sustainability.

Under the Planning Act, assessable development requires a development permit.

The proponent proposes to proceed through a MID process to address all assessable development under the Planning Act and in order to simplify approval requirements spanning multiple LGAs.

Where development aspects required for the construction of the project have not been included in the MID, the project element may require approval through the Planning Act, under a local government planning scheme.

4.2.3 Vegetation Management Act 1999

Operational works approval for vegetation clearing under the VM Act would be required where clearing cannot be conducted in accordance with the Planning Regulation Schedule 21 'exempt clearing work' (Part 1 (10(a) and (b)) or if not included within the MID. This would apply broadly across the entire project area.

4.2.4 Environmental Protection Act 1994

A key management tool under the EP Act is the regulation of environmentally relevant activities (ERAs).

An environmental authority is required to carry out any ERA. The temporary construction camps may need to establish onsite sewage treatment where a suitable connection to local government sewage treatment facilities is not achievable. While the project is not seeking stated conditions for ERA 63 (sewage treatment works) associated with construction camps as part of the EIS process, the proponent has indicated that should it be determined that approval for ERA 63 is required, consideration would occur through the MID process.

4.2.5 Fisheries Act 1994

Approval must be sought under the Fisheries Act to construct or raise assessable waterway barriers on a waterway. Works within waterways (waterway barrier works) must be authorised as per the Accepted Development Requirements (ADR) for operational works that is constructing or raising waterway barrier

works. Any waterway barrier work that does not meet the requirements of the ADR is assessable development and requires a development approval.

4.2.6 Nature Conservation Act 1992

Prior to clearing of native plants for the project, the proponent may be required to undertake flora surveys and obtain clearing permits or exempt clearing notifications for areas identified as being within the high-risk flora survey trigger areas for protected plants or where protected plants have been detected.

In addition, the conservation agreement for the Ballara Nature Refuge, prepared under section 22 of the NC Act, would need to be replaced to reflect project activities. The replacement Ballara Nature Refuge conservation agreement is expected to include an area of equal or greater size and environmental value which would be added to the gazetted nature refuge to prevent any net loss of its values as a result of the project.

4.2.7 Electricity Act 1994

The proponent has applied to the Director-General, Department of Energy and Public Works (as regulator of the *Electricity Act 1994*) to obtain transmission authority for the transmission line and works to construct the transmission line within the transmission line easement. This transmission authority has been granted and remains current until June 2023.

4.2.8 Aboriginal Cultural Heritage Act 1993

Part 7 of the ACH Act requires a cultural heritage management plan (CHMP) to be developed and approved when an EIS is required for a project.

The CHMPs would need to be approved by the Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships before the project can commence.

4.3 Local Government approvals

The project is located within the following LGAs:

- Burdekin Shire Council
- Charters Towers Regional Council
- Flinders Shire Council
- Richmond Shire Council
- McKinlay Shire Council
- Cloncurry Shire Council
- Mount Isa City Council.

The activities associated with the project are subject to development assessment under the Planning Act. Assessable development is likely to include a MCU under the relevant local planning schemes (code or impact assessable), building works, reconfiguration of a lot and operational works including excavating or filling that materially affects a premise or its use (bulk earthworks, road works), and clearing vegetation.

As described above, the proponent has indicated an intention to seek a MID under the provisions of the Planning Act. The MID process would consider the assessable matters within all local government development permits assessable under the Planning Regulation, removing the need to obtain separate development approvals from each local government.

The MID process would be informed by this evaluation report, including this report's recommended conditions to the Planning Minister. This report has been developed in consultation with the local governments.

Where development aspects required for the construction of the project have not been included in the MID process, the project element may require a development approval under a local planning scheme.

5. Evaluation of environmental impacts

This section discusses the major environmental effects of the project identified in the EIS. Some potential impacts of the project have been adequately addressed in the EIS. For these matters, the proponent's mitigation measures are appropriate. For the matters evaluated below, this report includes conditions or recommendations to build on proponent commitments to mitigate and/or manage potential adverse impacts.

5.1 Land use and landholders

Chapter 5 of the EIS provides the proponent's assessment of impacts from the project on land use and landholders. This section evaluates these potential impacts and the proponent's proposed mitigations and management strategies.

5.1.1 Existing environment

5.1.1.1 Land use

There are 2 regional plans relevant to the area traversed by the project; the North Queensland Regional Plan 2020 and the North West Regional Plan 2010 – 2031. The regional plans are strategic and statutory planning documents that seek to manage growth and change in their regions and incorporate provisions supporting infrastructure development including the provision of access to infrastructure, services and reliable energy.

The project corridor is located primarily on rural land across 7 LGAs. The local planning schemes relevant to the project are:

- Burdekin Shire IPA Planning Scheme (2011)
- Charters Towers Regional Council Town Plan (2006)
- Shire of Flinders Planning Scheme (2017)
- Richmond Shire Council Planning Scheme (2020)
- McKinlay Shire Planning Scheme (2019)
- Cloncurry Shire Council Planning Scheme (2016)
- City of Mount Isa Planning Scheme (2020).

The Queensland land use and planning framework is discussed further below in section 5.1.4.

The EIS states that land located within the project area is predominantly used for agriculture. Approximately 98% of the land impacted by the project is used for cattle grazing with the remaining 2% of land used for conservation and natural environments; refer Figure 5.1.

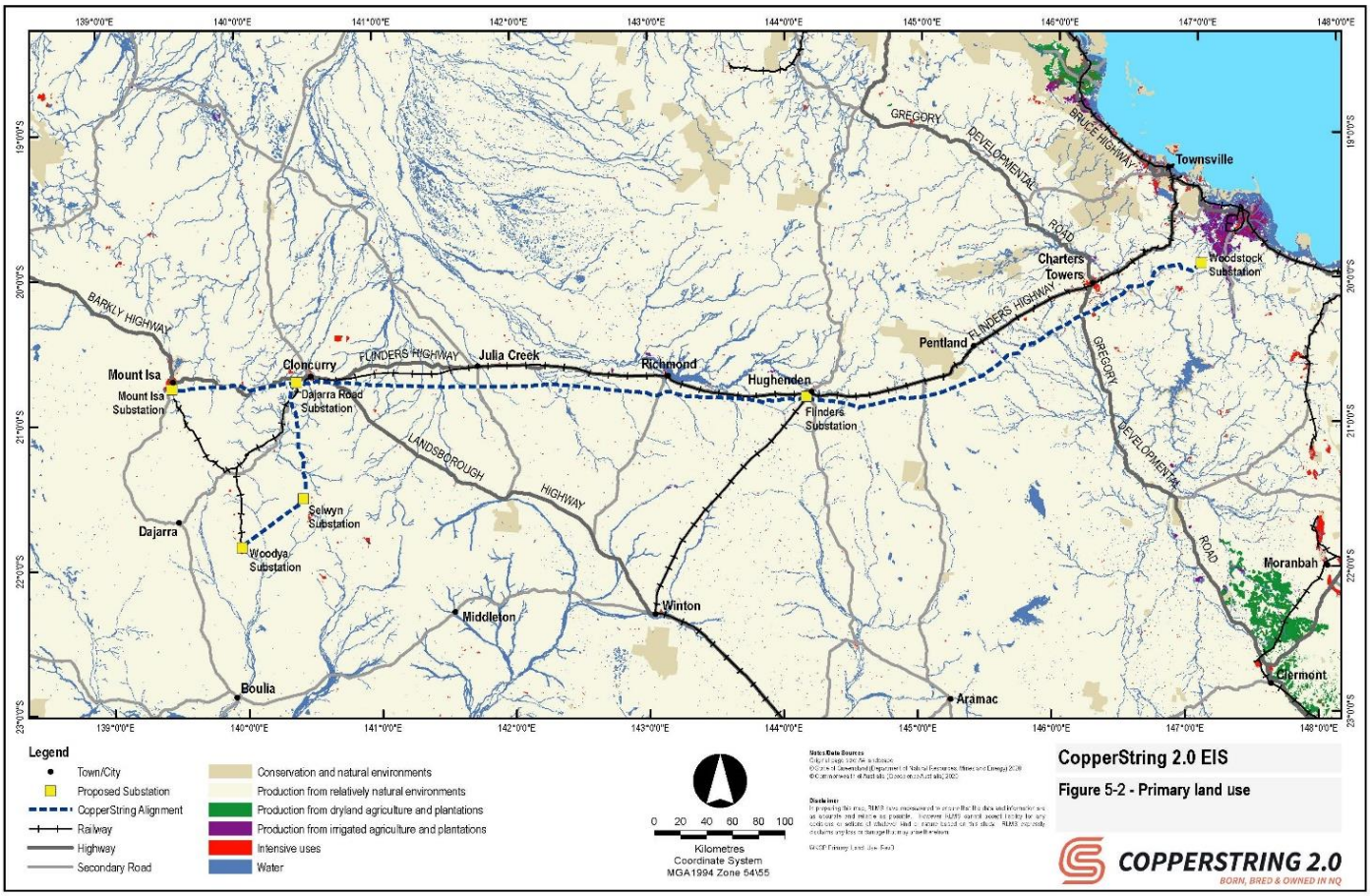

Figure 5.1 Primary land uses for project area[14]

North West Queensland is mineral rich and is a vital contributor to the Queensland economy. The area known as the NWMP extends from the Northern Territory border west of Mount Isa up to the Gulf of Carpentaria and contains some of the world's richest deposits of copper, silver and zinc.

The regions traversed by the project are subject to mining and exploration activities including:

- petroleum, geothermal, mining and mineral development activities (including exploration permits, mineral development licences and mining leases)
- active, disused and abandoned mine workings
- quarries and potential areas for future quarries, including a number of key resource areas.

The location of the project corridor is proposed to overlap existing exploration permits.

Mines currently operating in the NWMP include Century Mine, Mount Isa Mines, Ernest Henry Mine and Cannington Mine.

5.1.1.2 Townships and urban localities

The main towns in proximity to the project between Townsville and Mount Isa are Charters Towers, Hughenden, Richmond, Julia Creek and Cloncurry. The location of each of the townships and LGAs in proximity to the project area is illustrated in Figure 5.2.

[14] From the project EIS, Volume 2, Chapter 5. Updated version provided by proponent for this report.

The larger centres of Cloncurry and Charters Towers serve as administrative centres and service centres for the surrounding grazing industry. Mount Isa is the commercial, administrative and industrial centre for North West Queensland with a population of approximately 32,500 people. Mining and smelting are the main industrial activities.

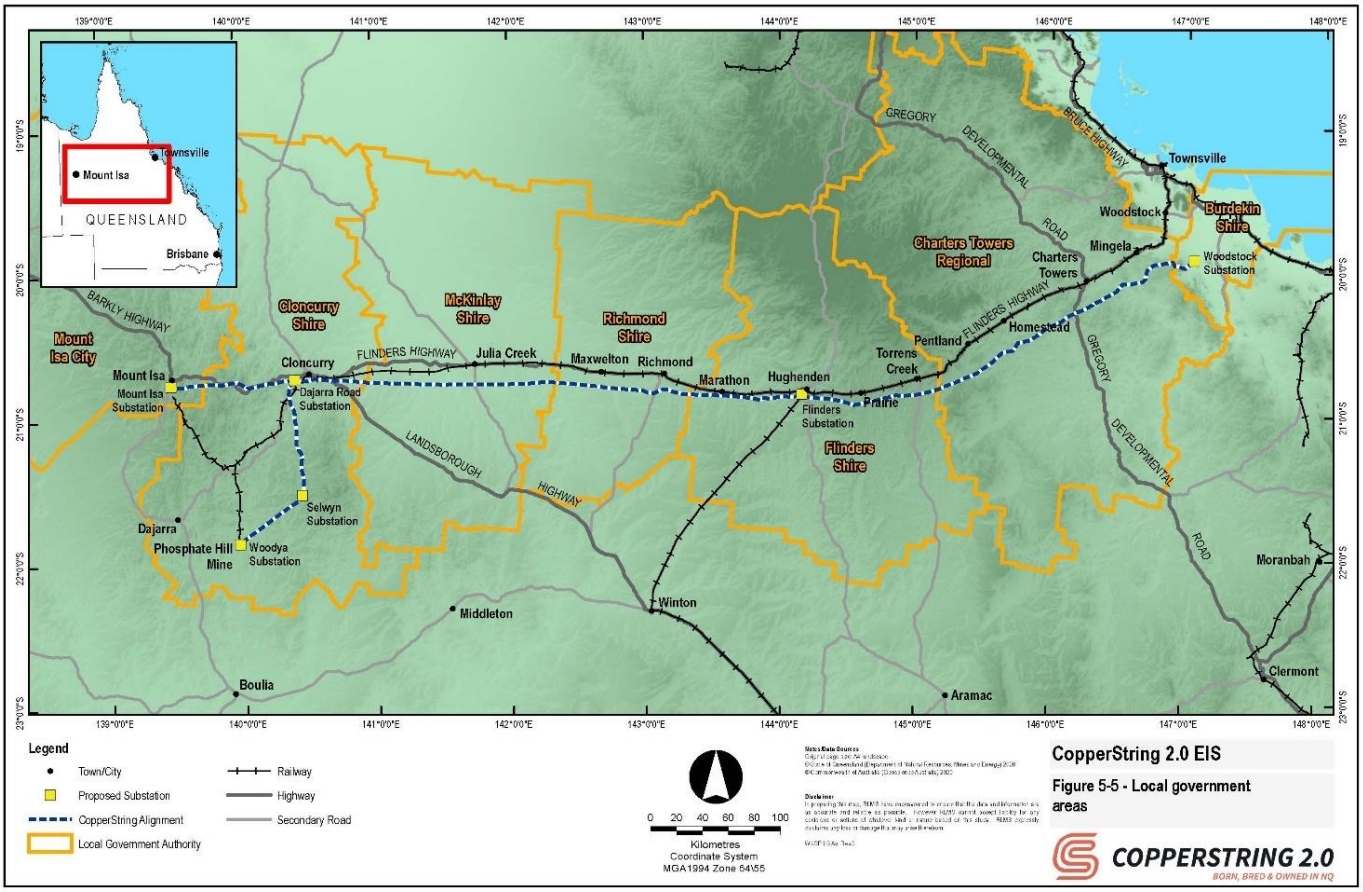

Figure 5.2 Local government areas for project area[15]

5.1.1.3 Native title

There are a number of active and determined registered native title claims across the project area as shown in Figure 5.3 and Table 5.1.

[15] From the project EIS, Volume 2, Chapter 5. Updated version provided by proponent for this report.

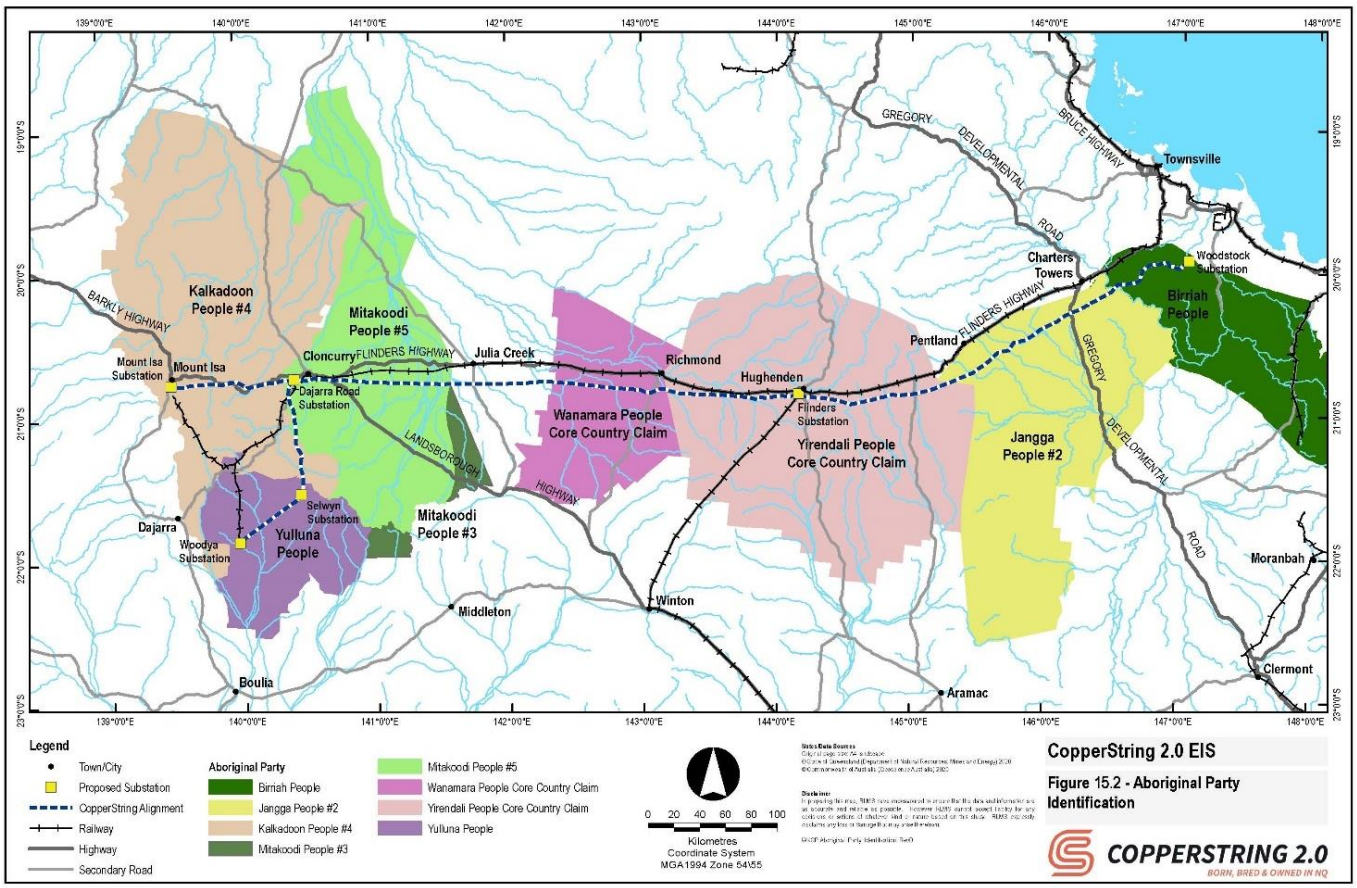

Figure 5.3 Aboriginal Party Identification[16]

Table 5.1 Native Title claims

Aboriginal party	Native Title party status
Birriah People	Native title exists in the entire determination area
Jangga People #2	Native title application accepted for registration 22 November 2019
Yirendali People Core Country Claim	Native title does not exist in relation to the determination area
Wanamara People Core Country Claim	Native title claim discontinued 9 April 2010
Mitakoodi People #3	Native title claim dismissed 4 January 2010
Mitakoodi People #5	Native title claim accepted for registration – registered from 25 September 2015 to 8 November 2019; registered from 21 February 2020
Kalkadoon People #4	Native title exists in parts of the determination area
Yulluna People	Native title exists in parts of the determination area

Australian law recognises native title as Aboriginal and Torres Strait Islander peoples' rights and interests in land and waters, held in accordance with their traditional laws and customs. Any future act, or proposed activity on land and/or waters which may affect native title, cannot proceed unless it complies with the *Native Title Act 1993* (Cth).

Where a proposed development impacts on a parcel of land and/or waters which is subject to a native title claim, or where native title has been determined to exist, and the impact will affect the existing rights

[16] From the project EIS, Volume 2, Chapter 5. Updated version provided by proponent for this report.

and interests of Aboriginal and Torres Strait Islander people in respect of that land and/or waters, the proponent is required to comply with the provisions of the *Native Title Act 1993*.This may involve the issuing of a section 24KA notice for the provision of *Facilities for services to the public*. Alternatively, the proponent can negotiate with the native title party/s an Indigenous Land Use Agreement (ILUA). The ILUA would be between the proponent and native title parties and other people or bodies about the use and management of areas of land and/or waters. An ILUA can be made over areas where:

- native title has been determined to exist in at least part of the area
- a native title claim has been made
- no native title claim has been made.[17]

See section 5.1.5.2 for further information on how the project may impact native title.

5.1.1.4 Landholders

A summary of the existing private and public land parcels impacted by the project are summarised in Table 5.2.

Table 5.2 Impacted land parcels

Impacted Land Parcels	Number of Land Parcels
Freehold	22
Estate in Unallocated State Land	11
Leasehold	
Rolling Term Lease	35
Term Lease	2
Freeholding Lease	0
Estate in Perpetuity	0
Perpetual	48
No Term	6
Reserve for Pasturage	0
Total	**124**

5.1.2 Submissions

The key issues regarding land use impacts raised in submissions on the EIS include:

- potential impacts to landholders and resource tenement holders, related to land acquisition, land access, land management (particularly related to weed and pest management and livestock and grazing activities), and resource sterilisation
- that the proposed Southern Connection alignment traversing the Ballara Nature Refuge would be inconsistent with the conservation agreement for the nature refuge.

This report has considered each submission received and the responses provided by the proponent in evaluation of the project. Assessment of key matters is provided below.

[17] National Native Title Tribunal, *About Indigenous Land Use Agreements (ILUAs)*, Commonwealth of Australia, 2021, http://www.nntt.gov.au/ILUAs/Pages/default.aspx.

5.1.3 Methodology

The study area is the project area, with consideration of key features in the broader region.

The EIS was informed by a desktop assessment to define the existing environment associated with the project and included a review of:

- historical workings (associated with previous mining and exploration activities), within and adjacent to the project area
- Australian Bureau of Statistics 2016 Census Data
- native title rights and interests
- proposed land acquisition approach to secure tenure for the project
- project construction hubs, timing and location of construction facilities and construction camps.

The EIS was informed by a range of data sources in developing an understanding of potential project impacts on the existing land use environment, including:

- Queensland Globe and GeoResGlobe mapping layers
- State Planning Policy (2017) and state codes
- relevant regional planning instruments and local government planning schemes
- regional planning interests (priority agricultural areas and strategic environmental areas).

5.1.4 Queensland land use planning framework

The Queensland land use planning system consists of a state-wide framework for land use planning that considers the needs of communities, developers and local government.

This section describes the local and state-wide land use planning instruments relevant to the project area.

5.1.4.1 Ministerial infrastructure designation

The proponent proposes to proceed through a MID process as an alternative to lodging multiple development applications within the 7 LGAs over which the project traverses. The MID would be decided by the Planning Minister and would provide a streamlined, whole of government consideration of the project. See Chapter 4 for more information on the project approvals framework.

The proponent considers the MID process the most appropriate approval pathway due to the long linear nature of the project and the need for consistent consideration of the project over multiple local government jurisdictions. It is unlikely that one MID would be lodged for the entire project, rather it is expected that MIDs for the project would be lodged in stages and be informed by land access and signed easement option agreements with landholders. The final configuration of MID proposals would be developed in consultation with Planning Group within DSDILGP and the Planning Minister.

The MID process would address all development permits assessable under the Planning Regulation. These are:

- MCU development permit(s) under a local planning scheme (transmission towers/lines, substations, construction camps, construction facilities)
- operational works development permit(s) under a local planning scheme (vegetation clearing and bulk earthworks associated with project activities).

Matters to be considered as part of the MID process would include:

- consultation plans specifically for each individual MID proposal with local government, state agencies and all impacted landholders, which would include notification letters, newspaper advertisements and coordinated engagement meetings
- evidence of 'ownership' or option agreements with landholders to use the land
- acquisition plans - defining land requirements to be designated on a lot-by-lot basis
- preliminary designs for tower siting, substation / CEV huts / camps / laydown sites to enable an agency level assessment consistent with requirements
- clearing of vegetation plans
- traffic and transport arrangements including access point intersection or road upgrades
- site specific investigations and plans including a Traffic Impact Assessment, flooding, civil earthworks, as would be expected to be lodged for a development approval
- planning assessment report(s) including consideration of relevant regional plans, state planning policies and local government planning schemes.

The proponent has committed to pursuing a MID in accordance with Chapter 2, Part 5 of the Planning Act. This report includes recommendations in Appendix 2, Part A, that the proposed MID application reference the EIS for the project and this report, including the recommendations and proponent commitments for additional information to be provided in a MID application and conditions recommended to be placed on a MID.

5.1.4.2 Regional plans

5.1.4.2.1 North Queensland Regional Plan 2020

The North Queensland Regional Plan 2020 is a 25-year strategic and statutory planning document that encompasses the LGAs of Burdekin, Charters Towers, Hinchinbrook, Palm Island and Townsville. The North Queensland Regional Plan 2020 seeks to concentrate and capitalise on renewable energy sources for energy networks and acknowledges that economic opportunities within the region require an effective and resilient infrastructure network to link infrastructure to users.

The EIS provided an assessment of the project against the desired regional outcomes of the North Queensland Regional Plan 2020 and demonstrates that the project supports the regional vision for North Queensland, particularly goals 1 and 4 which seek to grow a leading economy in regional Australia and promote a safe, connected and efficient North Queensland, respectively. This report considers the project to be consistent with the North Queensland Regional Plan 2020.

5.1.4.2.2 North West Regional Plan 2010 - 2031

The North West Regional Plan 2010-2031 provides a framework to manage growth and change at a regional level to 2031 for the western LGAs of Flinders, Richmond, McKinlay, Cloncurry and Mount Isa. The North West Regional Plan includes a number of provisions which support infrastructure development in the North West region including providing access to infrastructure, services and reliable energy supplies to support economic growth and create business opportunities.

The EIS provided an assessment of the project against the desired regional outcomes of the North West Regional Plan and demonstrates that the project supports infrastructure development in the region, specifically by providing infrastructure and energy services and supporting reliable and cost effective

energy infrastructure. This report considers the project to be consistent with the North West Regional Plan.

5.1.4.3 State Planning Policy

The State Planning Policy 2017 (SPP) defines the Queensland Government's policies about matters of state interest in land use planning and development.

The SPP is relevant to MID considerations. Accordingly, where the Planning Minister proposes making or amending a designation, the Planning Minister must have regard to the relevant provisions of the SPP as it relates to the proposed designation.

The SPP has effect throughout Queensland and prevails over regional plans and local planning instruments in the hierarchy of planning instruments under the Planning Act.

The EIS identifies the following 5 state interests as being applicable to the project:

(1) liveable communities and housing (liveable communities), see section 5.6 for more information on this topic

(2) economic growth, see section 5.5 for more information on this topic

(3) environment and heritage (biodiversity, cultural heritage and water quality), see sections 5.2, 5.3 and 5.7 for more information on these topics

(4) safety and resilience to hazards (natural hazards, risk and resilience), see section 5.8.5 for more information on this topic

(5) infrastructure (energy and water, infrastructure integration and transport infrastructure), see sections 5.4 and 5.8 for more information on this topic.

The project is a major electricity project that would connect the NWPS and foundation customers at isolated mine sites along the project route, to the state electricity grid. The proponent has considered the SPP through the EIS process and this report considers that the proposal is consistent with the outcomes sought by the SPP. The state interests would be further assessed through the subsequent MID assessment process, for which this report recommends conditions.

5.1.4.4 State Development Assessment Provisions

The State Development Assessment Provisions (SDAP) provide for specific matters of state interest and details the code assessment criteria for assessable development and referral requirements.

The SDAP assessment criteria are contained in stand-alone state codes which are broadly grouped into locational, use-based or advice only. The SDAP is a statutory document and is prescribed in the Planning Regulation.

The SDAP identifies the following matters of state interests potentially applicable to the project:

- development in a state-controlled road environment
- development in a railway environment
- protection of state transport networks
- native vegetation clearing.

Development approvals required for the project which involve the above matters would require assessment against the corresponding modules of the SDAP. The following state codes are applicable:

- State code 1: Development in a state-controlled road environment

- State code 2: Development in a railway environment
- State code 6: Protection of state transport networks
- State code 16: Native vegetation clearing.

A summary of how each of the applicable SDAP codes is addressed for this project is provided below.

5.1.4.4.1 Development in a state-controlled road environment (state code 1)

State code 1 of the SDAP seeks to ensure state-controlled roads, future state controlled roads (SCR) and other infrastructure in state-controlled roads are protected from adverse impacts of development. The EIS has demonstrated that the assessment criteria in this code are appropriately addressed particularly in relation to the protection of existing and future state transport infrastructure.

The EIS states that no project infrastructure would be located in a state controlled road, excluding overhead cables. The proponent would undertake maintenance activities (such as vegetation trimming) in accordance with the Department of Transport Main Roads (DTMR) requirements. There would be minimal filling and excavation works required for the project and none would interfere with, or result in damage to, infrastructure or services in a SCR, (excluding potential upgrades to existing intersections, which would be undertaken in consultation with DTMR).

The proponent has committed to provide further information about the proposed traffic routes and distributions as part of a detailed traffic impact assessment (TIA) to be prepared in accordance with the DTMR's *Guide to Traffic Impact Assessment* (GTIA) and included in a MID application. The TIA needs to be sufficiently detailed to demonstrate the need for all the works identified in a MID application. A recommendation in Appendix 2, Part A of this report reinforces the proponent's commitment to provide a detailed TIA in a MID application.

In addition, the proponent has committed to developing and implementing a road use management plan (RUMP) to address the increase of traffic on local roads and highways during construction, as well as a traffic management plan (TMP) to identify roads that would be impacted for each construction hub and traffic management works required to be undertaken to manage impacts. The proponent's commitment to prepare the RUMP and TMP is reinforced by a recommendation in Appendix 2, Part B of this report.

Subject to the recommendations in Appendix 2, Part A and Part B of this report, the project is considered generally consistent with the overarching objectives of state code 1.

For an additional assessment of matters relating to the road network, refer to section 5.4 of this report.

5.1.4.4.2 Development in a railway environment (state code 2)

State code 2 of the SDAP seeks to protect railways, future railways and other infrastructure in a railway corridor from adverse impacts of development. The purpose of this code is also to protect the safety of people using, living and working near railways. The EIS is required to demonstrate that the assessment criteria in this module are appropriately addressed, particularly in relation to the protection of existing and future railway corridors.

The EIS states that no project infrastructure is proposed to be located within the railway corridor (excluding overhead cables) and that the final transmission tower sites would be determined after careful consideration of physical constraints including proximity to the rail corridor. Temporary clearance structures would need to be installed at road and rail crossings to present conductors or draw lines from sagging onto existing infrastructure during the stringing stage of construction. Once the conductors have been fixed to the transmission towers the temporary clearance structures would be removed.

Conductor cables would be installed overhead via helicopter with appropriate construction phase clearances in accordance with DTMR (Queensland Rail) requirements. No project infrastructure is

proposed to be located within 3 m of the outermost projection of overhead line equipment. Transmission towers would be designed with sufficient height to ensure transmission lines do not encroach upon height restrictions. Further, there would be minimal filling and excavation required for the project and none that would interfere with, or result in damage to, infrastructure or services in a railway corridor. Project vehicle access would not be located within 5 m of existing public passenger transport infrastructure.

To mitigate potential impacts on the rail network, the proponent has committed to develop a TIA in consultation with relevant transport authorities including DTMR, Queensland Rail and local governments, which would include a detailed rail impact assessment outlining the volumes and frequency of traffic expected to traverse level rail crossings. The proponent's commitment to prepare a detailed rail impact assessment as part of a TMP is reflected in recommendations in Appendix 2, Part A of this report. The proponent's commitment to consult with DTMR, Queensland Rail, the Department of Education, local governments, the Queensland Police Service (QPS), the Queensland Ambulance Service (QAS), the Queensland Fire and Emergency Services and other agencies as necessary, in the development of the TMP is reflected in recommendations in Appendix 2, Part B of this report. This report also includes the recommendation in Appendix 2, Part B that mitigation works and actions in the TMP are implemented during the construction phase of the project.

The proponent has committed to consult the owners of any infrastructure, that the project may cross, including Queensland Rail, to provide detail on the transmission line crossing, and once the detailed design and staging of the project is finalised, arrange any planned outages. This commitment is reinforced by a recommendation in Appendix 2, Part B of this report, with consultation to occur prior to the construction phase of the project.

Subject to the recommendations in Appendix 2, Part A and Part B of this report, the project is considered generally consistent with the overarching objectives of state code 2.

For additional assessment of matters relating to rail network impacts, refer to section 5.4 of this report.

5.1.4.4.3 Protection of state transport networks (state code 6)

State code 6 of the SDAP seeks to protect state transport infrastructure, public passenger transport infrastructure and public passenger services from adverse impacts of development, maintain operational performance of the transport network and ensure development enables safe and convenient access to public passenger transport. The EIS is required to demonstrate that the assessment criteria in this module are appropriately addressed particularly in relation to the safety, function and operational efficiency of the state road network.

The EIS states that no project infrastructure is to be located in a SCR, there would be minimal filling and excavation required for the project, and none that would interfere with or result in damage to infrastructure of services in a SCR. Where potential upgrades to existing intersections within a SCR are required, the proponent would be required to demonstrate compliance with DTMR's GTIA as part of preparing a detailed TIA. The project is not located on land identified by DTMR as required for planned upgrades of SCRs. The project would not obstruct public passenger transport infrastructure or public passenger services.

As outlined above in response to state code 1, the proponent has committed to provide further information about the proposed traffic routes and distributions as part of a detailed TIA, prepared in accordance with the DTMR's GTIA and included in a MID application. The proponent has also committed to developing and implementing a RUMP to address the increase of traffic on local roads and highways during construction and a TMP identifying roads that would be impacted for each construction hub, and traffic management works required to be undertaken to manage impacts.

The proponent's commitments to prepare the TIA, RUMP and TMP are reinforced in recommendations in Appendix 2, Part B of this report.

Subject to the recommendations in Appendix 2, Part A and Part B of this report, the project is considered to be generally consistent with the overarching objectives of state code 6.

For additional assessment of matters relating to road and rail networks, refer to section 5.4 of this report.

5.1.4.4.4 Native vegetation clearing (state code 16)

State code 16 of the SDAP seeks to ensure that development avoids impacts on clearing, or where avoidance is not reasonably possible, minimises and mitigates impacts. The proposed transmission line would involve native vegetation clearing.

The EIS states that the project would be developed with consideration of the existing natural environment using a range of mechanisms, such as route realignments and locating project infrastructure in areas of non-remnant vegetation and away from watercourses, to avoid or minimise impacts on areas of high ecological value.

Areas of high habitat connectivity that are intersected by the project would be identified and measures undertaken that would improve or restore connectivity across the project corridor following completion of construction. This would include spanning over sensitive areas with taller masts to minimise non-essential clearing and leaving corridors of trees for connectivity.

The EIS concludes that the project would have a significant residual impact on 84 ha of regulated vegetation. The proponent notes that the proposed approach to the delivery of offsets, involving the confirmation of impact areas, would not be determined until detailed design had been developed and a determination of the actual on-ground extent of impacts has been completed. Offset requirements associated with an operational works approval for vegetation clearing under the *Vegetation Management Act 1999* (VM Act) would not be required where vegetation clearing can be conducted in accordance with 'exempt clearing work' or included within a subsequent MID application.

Subject to the recommendations in Appendix 2, Part A and Part B of this report, the project is considered to be generally consistent with the overarching objectives of state code 16.

For a detailed assessment of matters relating to native vegetation, refer to section 5.2 of this report.

5.1.4.5 Regional Planning Interests

The *Regional Planning Interests Act 2014* (RPI Act) was drafted to protect areas of regional interest from the impact of resource activities or regulated activities (i.e. broadacre cropping or dams). The RPI Act also gives effect to the policies about matters of state interest stated in regional plans including the North Queensland Regional Plan and North West Regional Plan.

The RPI Act identifies each of the following as an area of regional interest:

- priority agricultural areas
- priority living areas
- strategic cropping areas
- strategic environmental areas.

Where a resource activity or regulated activity is likely to impact on regional interests, a Regional Interests Development Approval is required from the DSDILGP.

The project does not involve a resource activity or regulated activity, therefore regional interests are not impacted by the project and a regional interest development approval would not be required under the RPI Act.

5.1.4.6 Local planning schemes

The project traverses 7 LGAs. The local planning schemes relevant to the project are:

- Burdekin Shire IPA Planning Scheme (2011)
- Charters Towers Regional Council Town Plan (2006)
- Shire of Flinders Planning Scheme (2017)
- Richmond Shire Council Planning Scheme (2020)
- McKinlay Shire Planning Scheme (2019)
- Cloncurry Shire Council Planning Scheme (2016)
- City of Mount Isa Planning Scheme (2020).

Due to the considerable length of the project corridor and the number of LGAs traversed by the project, the proponent considers a MID process to be the most appropriate and efficient process for considering the project across the 7 LGAs. It is expected that multiple MID proposals would be progressed, generally in accordance with the proposed 9 construction hubs.

Application of a MID makes development 'accepted development' for the purposes of the Planning Act. While permits and approvals are not technically obtained through a MID, the need to obtain them from each LGA is negated should a MID be made. Building works approvals under the *Building Act 1975* are still required despite any MID. While the proponent anticipates that construction camp locations would be considered as part of a MID process, there is a potential alternative for the proponent to obtain MCU approval from LGAs, for some components of the project.

The proponent must, as part of a MID process, ensure the lodgement material includes reference to the conditions, recommendations and proponent commitments of the project EIS.

5.1.5 Landholders and tenure

5.1.5.1 Landholder impacts

The EIS states that 124 land parcels would be impacted by project infrastructure. Access tracks would traverse some additional land parcels south of the Flinders Highway in order to access the project area.

Potential impacts to landholders and resource tenement holders include disturbance (i.e. from earthworks, clearing areas for project infrastructure, use of access tracks) to general rural agricultural production and land management practices (particularly related to weed and pest management and livestock and grazing), mining operations and resource exploration, and existing and future infrastructure corridors. Activities such as construction camps and laydown and delivery areas are temporary and would be removed from the landscape at the end of the construction period.

Project construction and operation activities such as the placement of infrastructure and access tracks could potentially impact several stock routes, causing disturbance to stock movements to pasture for emergency agistment and long-term grazing.

The proponent proposes to utilise option agreements for the purposes of acquiring easement rights. Option agreements may allow for access to lands for construction prior to the registration of easements

and would include requirements for the proponent to have insurances in place prior to access. For land in which the state has an interest, these insurances would be required by the Department of Resources.

The proponent intends to pursue easements over mining tenures in a similar way, with options agreements with tenement holders proposed prior to the registration of easements. The EIS states that the proponent may consider adjustment of the corridor to avoid sterilisation of a commercial mineral resource through negotiation with the tenement holder and the Department of Resources. These agreements and associated commercial negotiations are to be progressed by the proponent outside of this EIS process, and as such are not considered further in this report.

The Southern Connection of the project would traverse the Ballara Nature Refuge which is subject to a conservation agreement between the landholder and the state. For a detailed evaluation of impacts on the Ballara Nature Refuge see section 5.2.8.

5.1.5.1.1 Mitigation of landholder impacts

In the EIS the proponent described its ongoing stakeholder engagement program and has committed to negotiate with landholders and stakeholders regarding the locations of project infrastructure during detailed design. Through these conversations it is proposed to investigate how conflicts with landholders use of their land can be avoided, mitigated or managed. This commitment is reinforced by recommendations in Appendix 2, Part B of this report for conditions that require consultation with landholders during detailed design to ensure land use conflicts are minimised, these may include locating infrastructure to reduce rural land fragmentation and landholder disturbance, where practicable.

The proponent has committed to engaging with landholders and resource tenement holders in accordance with the proponent's land acquisition protocols. These protocols seek to ensure negotiations are conducted in good faith with the proponent paying compensation for the acquisition of land and easement rights based on property valuations conducted by registered valuers. This consultation process may include assessment of alternative corridor routes. The proponent has also committed to implement weed and pest management measures during construction as well as undertake a detailed assessment of biosecurity risks associated with specific work activities and construction methods. This commitment is reinforced by a recommendation in Appendix 2, Part B of this report that a biosecurity management plan be prepared prior to commencement of works.

The proponent has committed to locating infrastructure outside of stock routes as far as practicable to mitigate disruption to operation of stock routes. This commitment is reinforced by a recommendation in Appendix 2, Part B of this report that disruption to stock routes from project infrastructure be avoided, as far as practicable.

5.1.5.2 Native title

Native title has been extinguished in relation to freehold grants and perpetual leases along the project corridor, therefore project activities will not affect native title rights and interests undertaken within the boundaries of freehold land and perpetual leases. However, native title has not been extinguished on some leasehold land, therefore native title compliance would be required for any project activity on leasehold land.

The project corridor intersects a small part of the Mitakoodi People #3 claim area (approximately 500 m). While the Mitakoodi People #3 native time claim was dismissed by the Federal Court in 2010, the Mitakoodi People have Aboriginal Party status as a cultural heritage party for the area under the *Aboriginal Cultural Heritage Act 2003* and the proponent is currently preparing a CHMP in consultation with the Mitakoodi People with respect to the Mitakoodi People #3 claim area requirements of the CHMP. See section 5.7 for further information.

The EIS states that the project is anticipated to have limited impacts on native title, although these aspects remain under investigation and will continue outside of this EIS process.

5.1.5.2.1 Mitigation of native title impacts

The EIS states that the project fulfils the requirements of section 24KA of the *Native Title Act 1993*; i.e. where a proposed development is a facility for services to the public which impacts on a parcel of land which is subject to a native title claim, or where native title exits, the project would suppress the existing rights and interests of Aboriginal and Torres Strait Islander people in respect of that land, until such time as the easement is removed. Where native title is not suppressed, the proponent would be required to negotiate an ILUA in accordance with the requirements of the *Native Title Act 1993*.

The proponent has committed to ongoing engagement with stakeholders to exchange information on project infrastructure design and construction and to investigate how land use conflicts can be managed.

5.1.6 Coordinator-General's conclusion: land use and landholders

The EIS identifies the potential land use impacts associated with the project. I am satisfied with the proponent's proposed mitigation measures to reduce potential impacts to land uses at this stage of the project development.

The proponent proposes to proceed through a MID process as an alternative to lodging multiple development applications with the seven local governments over which the project traverses. The MID would be decided by the Planning Minister and would provide a considered, whole of government response, to facilitate the efficient provision of community infrastructure. It is expected that the MID process would progress in a staged format in accordance with land access and generally in accordance with the proposed nine construction hubs. The final configuration of MID proposals would be developed in consultation with the DSDILGP and Planning Minister.

The MID process would address all development permits assessable under the Planning Regulation. This report includes recommended conditions in Appendix 2, Part A to include in a MID, including recommended conditions to address SDAP codes.

The proponent has committed to consult with landholders to investigate how conflicts with landholders use of their land can be avoided, mitigated or managed. The proponent has also committed to engaging with landholders and resource tenement holders in accordance with the proponent's land acquisition protocols as well as prepare a biosecurity management plan prior to commencement of works. These commitments are reinforced by recommendations in Appendix 2, Part B of this report.

Through the implementation of the proponent's commitments and report recommendations, the potential impacts on land management for landholders and resource tenure holders would be appropriately identified and managed addressing the issue raised by submitters.

5.2 Matters of state environmental significance

This section addresses the potential impacts of the project on matters of state environmental significance (MSES) during the construction and operation of the project and the proponent's proposed mitigation and management strategies.

This section only evaluates potential impacts to environmental values which are MSES, however, impacts on MSES that are also listed as matters of national environmental significance (MNES) under the EPBC Act are addressed in detail in Chapter 6.

It should be noted that under the *Environmental Offsets Act 2014* the State cannot duplicate conditions for offsets for prescribed environmental matters that are MSES where the Commonwealth has provided conditions requiring offsets for the same or substantially the same impact and the same or substantially the same prescribed environmental matter.

The MSES relevant to the project defined by the Environmental Offsets Regulation 2014 (EO Regulation) include:

- regulated vegetation, including:
  - 'endangered' and 'of concern' regional ecosystems (REs)
  - an area of essential habitat on the essential habitat map for an animal or plant that is endangered wildlife or vulnerable wildlife
  - REs that are located within a defined distance from the defining banks of a relevant watercourse
  - REs that intersects with an area shown as a wetland on the vegetation management wetlands map (to the extent of the intersection)
- connectivity areas
- any part of a waterway providing for passage of fish, only if the construction, installation or modification of waterway barrier works carried out under an authority will limit the passage of fish along the waterway
- protected wildlife habitat
  - a habitat for a species listed as endangered or vulnerable wildlife, or a special least concern animal under the NC Act
- a protected area
- a wetland in a wetland protection area or a wetland of high ecological significance (HES) shown on the map of referable wetlands
- a wetland or watercourse in high ecological value (HEV) waters.

There is considerable overlap between the MNES and MSES relevant to the project as outlined in Table 5.3. Rather than duplicating key aspects of the evaluation which relate to impacts on overlapping matters, a more detailed assessment of the project's MSES which are also MNES is provided in Chapter 6 of this report.

Table 5.3 Overlap between MSES and MNES values

MSES value	Overlapping MNES value
Regulated vegetation	
Essential habitat for the Julia Creek dunnart	Habitat for the Julia Creek dunnart
Essential habitat for the ornamental snake	Important habitat for the ornamental snake
Essential habitat for the squatter pigeon	Habitat for the squatter pigeon
Essential habitat for the waxy cabbage palm	Suitable habitat for an important population of waxy cabbage palm
Connectivity areas	
Connectivity areas (All remnant vegetation on the project site contributes to connectivity)	All remnant vegetation in the project corridor as habitat for a range of EPBC listed species, including connectivity values

MSES value	Overlapping MNES value
Protected wildlife habitat – protected plants and fauna	
Protected high risk trigger area for the waxy cabbage palm	Suitable habitat for an important population of waxy cabbage palm
Habitat for the koala, Julia Creek dunnart, ornamental snake, squatter pigeon, black-throated finch, Australian painted snipe, painted honeyeater, night parrot, red goshawk, plains death adder	Habitat for the koala, Julia Creek dunnart, ornamental snake, squatter pigeon, black-throated finch, Australian painted snipe, painted honeyeater, night parrot, red goshawk, plains death adder

The project has been determined to be a controlled action under the EPBC Act. Accordingly, an offset would be provided for significant residual impacts (SRI) on MNES. This negates the need for the Queensland Government to also require offsets on MSES values where they overlap with MNES. Where offsets are required for a species that is designated as both MSES and MNES, one offset is required.

The proponent was required to complete comprehensive field surveys for the EIS to confirm the occurrence of MSES including threatened species or presence of suitable habitat for them. This report notes that agencies with an interest in biodiversity (including DES) were consulted on the survey effort undertaken by the proponent in the study area[18] to support the project concept design. Agency advice was that the survey effort to date was adequate for a reliable, precautionary quantification of predicted impacts during the EIS process.

As part of the detailed design phase of the project and prior to commencement of construction, the proponent would undertake targeted pre-clearance surveys which would deliver ground truth information to confirm presence of MSES and the actual extent of impact (if any).

5.2.1 Existing environment

The project corridor traverses a diverse array of geographical and topographical landscapes across 6 of Queensland's 13 bioregions (refer to Figure 5.4), including (from east to west) the:

- Brigalow Belt bioregion characterised by the natural overstorey dominance of silver-foliage wattle named brigalow and supported by mixed eucalypt woodlands, softwood scrubs and open grasslands
- Einasleigh Uplands bioregion located along an elevated section of the Great Diving Range which supports open eucalypt woodlands and dry rainforests
- Desert Uplands bioregion located between coastal and inland catchments which supports acacia woodlands and native pastures of spinifex and Mitchell tussock grass
- Mitchell Grass Downs bioregion located within a tropical semi-arid environment and characterised by distinct undulating clay plains dominated by Mitchell tussock grass and devoid of major tree cover
- Gulf Plains bioregion dominated by grasslands and eucalypt woodlands occurring upon plains and river channels comprised of alluvial soils
- Northwest Highlands bioregion located in western Queensland and dominated by low open woodlands with spinifex hummock grass groundcover across a range of landforms (i.e. rugged hills, mountain ranges, undulating hills).

The majority of the project corridor lies within relatively uniform open rural landscape dominated by current and historical grazing activities and expansive areas of least concern vegetation. The White Mountain National Park is the closest national park, located 5 km south of the corridor. The Southern Connection section of the project (detailed in section 2.2.2) intersects with the Ballara Nature Refuge between the Dajarra Road Substation and the Selwyn Range and is discussed further in section 5.2.8.

[18] The study area refers to the 5 km corridor which was subject to the field and desktop assessments (2.5 km either side of the corridor selection).

Further discussion regarding the existing environment; avoidance, rehabilitation and offsets, and assessment methodology is provided in Chapter 6.

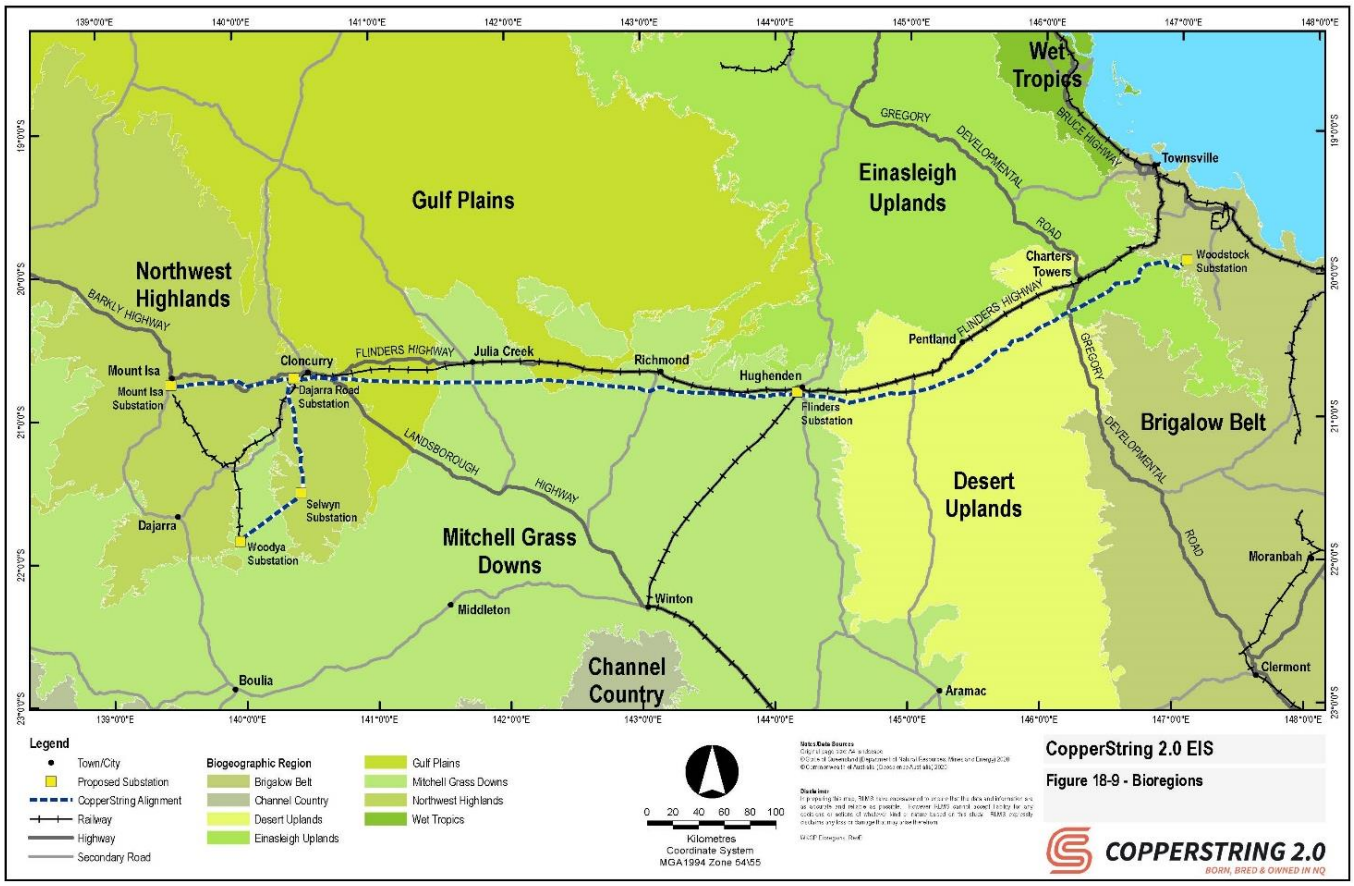

Figure 5.4 Bioregions intersected by the project corridor[19]

5.2.2 Submissions

The key issues regarding MSES impacts raised in submissions on the EIS include:

- alignment of the project corridor through the Ballara Nature Refuge and potential impacts to the refuge
- limited detail on the location of clearing for project activities to determine total vegetation loss, habitat impacts, and potential offsets required
- limited information of project impacts on listed threatened and migratory species
- the need for development of an environment offset strategy
- uncertainty on the extent and efficacy of proposed rehabilitation works
- potential for introduction of highly invasive pest and weed species along the project corridor, such as non-native Grader Grass and/or Thatch Grass not palatable to livestock
- potential mortality of bird species from direct strike with construction and maintenance vehicles and direct collision with transmission infrastructure, and the need for monitoring of species mortality
- management and measures for disposal of cleared weeds

[19] From the project EIS, Volume 4. Updated version provided by proponent for this report.

- the requirement to better define species presence and areas of native vegetation clearing along the project corridor following detailed design
- modification/removal of surface water feature terrestrial and aquatic fauna habitat due to deposition of sediment from erosion and sedimentation.

This report has considered each submission received and the responses provided by the proponent in evaluation of the project. Assessment of key matters is provided below.

5.2.3 Regulated vegetation

5.2.3.1 Background

The EO Regulation defines specific categories of remnant vegetation as prescribed RE and MSES. Remnant vegetation considered to be a prescribed RE (and MSES) includes the following:

- 'endangered' or 'of concern' RE's, as defined under the VM Act
- essential habitat for wildlife declared endangered or vulnerable under NC Act, as defined by the EO Regulation
- remnant vegetation which is located within the defined distance from the defining banks of a watercourse identified on the vegetation management watercourse map, as defined under the VM Act.
- remnant vegetation which intersects with an area shown on the vegetation management wetland map, as defined under the VM Act
  - note that no remnant vegetation intersecting with an area shown on the vegetation management wetland map is intersected by the project corridor as such no further discussion is provided in this report for this type of remnant vegetation.

5.2.3.2 Potential impacts

The EIS determined that the project corridor intersects approximately 265.78 ha of non-remnant vegetation and 6,355.09 ha of remnant vegetation. The EIS identifies that temporary construction activities and permanent operational infrastructure as outlined in Table 6.2 of Chapter 6 have been located in areas of non-remnant vegetation where possible, however up to 808.14 ha of the regulated vegetation considered to be MSES is still predicted to be cleared, which includes:

- 42.68 ha of 'of concern' RE
- 109.03 ha of essential habitat for the ornamental snake, squatter pigeon and waxy cabbage palm
- 77.87 ha of essential habitat for the purple-necked rock wallaby
- 17.06 ha of essential habitat for the Julia Creek dunnart
- 561.50 ha of remnant vegetation which occurs within the defined distance of a watercourse (watercourse vegetation).

The EIS identified that the concept design for the project presented in the EIS is subject to change as part of the detailed design phase. The final design, location and configuration of temporary construction activities and operational infrastructure (also referred to as 'micro-siting', discussed in section 6.2.4.1) would be informed by pre-clearance surveys prior to the commencement of construction and may allow for the further protection of species, habitat and features of conservation significance.

Micro-siting is defined in information provided by the proponent during evaluation of the EIS, and is further described in Appendix 5 of this report.

In addition, the extent and type of disturbance to habitats associated with vegetation clearing is expected to vary across the project. The EIS noted that in some areas large mature trees will require clearing resulting in ripping soils, scraping of ground topsoils and/or compaction of soils. Other areas might not trigger any disturbance or only require grass slashing or minor pruning (i.e. transmission line clearing [below 1 m] for line of sight, transmission line clearing [above 3.5 m] for conductor clearance). As such, the estimated regulated vegetation impacts discussed are considered in this report as precautionary, worst case estimations which are likely to be refined and improved during detailed design and throughout construction.

Indirect impacts on regulated vegetation are also discussed in the EIS, particularly in relation to the introduction and spread of invasive pest and weed species and degradation of riparian vegetation through exposure to dust, run-off and sedimentation.

As discussed in section 5.3, the project corridor crosses over the locations of a range of groundwater resources, including the Great Artesian Basin (GAB) from Pentland to Cloncurry. The EIS identified only limited interaction between regulated vegetation and groundwater, as potable water supply to construction camps and for construction and cleaning activities would be sourced from existing local government council supplies where capacity is available rather than extracting groundwater. The EIS identified an initial assessment of the existing local government council supplies indicates the use of town water will have a minimal impact to existing groundwater resources and therefore minimal impacts are expected because of groundwater drawdown.

Non-potable water supply requirements for dust suppression and concrete batching plants would be sourced from existing licensed and authorised water sources along the project corridor which would be confirmed during detailed design and in consultation with the Department of Regional Development, Manufacturing and Water (DRDMW) and landholders.

Excavation activities are not anticipated to reach depths that would impact groundwater.

5.2.3.2.1 Regional ecosystems

The REs that are classified as ‘of concern’ (under the VM Act) situated within the project corridor and likely to be impacted are provided in Table 5.4. The EIS identified that no ‘endangered’ REs would be impacted by the project.

Table 5.4 Regional ecosystems within the project corridor and potential area of impact

RE type	VM Act class	Description	Project corridor section	Area within project footprint (ha)
1.11.7	Of concern	*Acacia cambagei* low woodland on metamorphic hills	• CopperString Core • Mount Isa Augmentation • Southern Connection • Woodya Connection	24.19
2.3.43	Of concern	*Sporobolus mitchellii* +/- *Cyperus bifax, Astrebla elymoides, Chenopodium auricomum* tussock grassland on seasonally inundated alluvial plains and drainage depressions	• CopperString Core	11.12
1.11.14	Of concern	*Acacia cambagei* low open woodland with ground layer including Astrebla spp.	• Woodya Connection	7.37
			Total	**42.68**

Due to restricted access to the mapped areas of 'of concern' RE 2.3.43 that occur at the Gilliat River crossing and areas of mapped 'of concern' RE 1.11.14 within the Woodya section, desktop mapping was not verified during the EIS field surveys. These areas would be subject to targeted pre-clearance surveys to confirm presence and quality of these mapped RE extents.

The 'of concern' RE 1.11.7 was mapped with 5 homogenous or mixed polygons (polygons with more than one RE occurring in them) and was stated in the EIS to only represent 5 or 10% of any one mixed polygon. It is considered in the EIS that due to the location of this RE type, small patches on the side of ridges, most areas of RE 1.11.7 could be spanned across and clearing of low canopy vegetation avoided through appropriate tower placement, heights and span lengths (referred to as 'micro-siting', discussed in section 6.2.4.1).

The EIS acknowledged the extent of these RE to be impacted by the project would be reduced significantly following detailed design. For example, transmission towers would be positioned to avoid drainage depressions where RE 2.3.43 predominates.

5.2.3.2.2 Essential habitat

The EIS indicated that the project would directly cause the loss of 203.96 ha of mapped essential habitat for 4 threatened fauna species and one threatened flora species within the project corridor including:

- Julia Creek dunnart (*Sminthopsis douglasi*) – listed as vulnerable under the EPBC Act and as endangered under the NC Act
- ornamental snake (*Denisonia maculata*) – listed as vulnerable under the EPBC Act and NC Act
- squatter pigeon (southern) (*Geophaps scripta scripta*) – listed as vulnerable under the EPBC Act and NC Act
- purple-necked rock wallaby (*Petrogale purpureicollis*) - listed as vulnerable under the NC Act
- waxy cabbage palm (*Livistona lanuginose*) - listed as vulnerable under the EPBC Act and NC Act.

It is noted that the mapped essential habitat for the Julia Creek dunnart, ornamental snake, squatter pigeon and waxy cabbage palm which would be cleared for the project is also habitat for threatened species under the EPBC Act. As such, the offset requirements (if any) for the impact to essential habitat for these species would be provided through the proposed offsets for the loss of habitat for species listed under the EPBC Act.

This report has considered impacts to mapped essential habitat for the purple-necked rock wallaby in section 5.2.7 as part of protected wildlife habitat for the species. Protected wildlife habitat considers areas of essential habitat on the essential habitat map for an animal in addition to areas of foraging, roosting, nesting or breeding habitat.

5.2.3.2.3 Remnant vegetation within the defined distance of a watercourse (watercourse vegetation)

The project is partially located within the Townsville Plains subregion of the Brigalow Belt bioregion (a coastal bioregion). The following distances are applied to identify remnant vegetation associated with a watercourse[20] in a coastal bioregion:

- watercourse stream order 1 or 2 = remnant vegetation within 10 m
- watercourse stream order 3 or 4 = remnant vegetation within 25 m

[20] Queensland Environmental Offsets Policy, Version 1.12. Department of Environment and Science. https://environment.des.qld.gov.au/__data/assets/pdf_file/0022/266062/offsets-policyv1-12.pdf.

- watercourse stream order 5 or greater = remnant vegetation within 50 m.

The remainder of the project is located within non-coastal bioregions being the Broken River subregion of the Einasleigh Uplands bioregion and Desert Uplands, Mitchell Grass Downs, Gulf Plains and Northwest Highlands bioregions. The following distances are applied to identify remnant vegetation associated with a watercourse in a non-coastal bioregion:

- watercourse stream order 1 or 2 = remnant vegetation within 25 m
- watercourse stream order 3 or 4 = remnant vegetation within 50 m
- watercourse stream order 5 or greater = remnant vegetation within 100 m.

The EIS identified a total of 24.76 ha of 'of concern' remnant vegetation and 536.74 ha of 'least concern' remnant vegetation within the defined distance of a watercourse (watercourse vegetation) as shown in Table 5.5. At maximum disturbance, a total of approximately 561.5 ha of watercourse vegetation would be required to be cleared for temporary construction activities and permanent project infrastructure.

Table 5.5 Regulated vegetation within a defined distance of a watercourse

VM Act class	Coastal / Non-coastal	Stream order	Area of potential impact (ha)
Of concern	Non-coastal	Stream order 1 or 2 – 25 m	0.68
	Non-coastal	Stream order 3 or 4 – 50 m	0.56
	Non-coastal	Stream order > 5 – 100 m	23.52
		Sub-total	**24.76**
Least concern	Coastal	Stream order 1 or 2 – 10 m	1.63
	Non-coastal	Stream order 1 or 2 – 25 m	276.35
	Non-coastal	Stream order 3 or 4 – 50 m	112.58
	Non-coastal	Stream order > 5 – 100 m	146.17
		Sub-total	**536.75**
		Total	**561.51**

5.2.3.3 Mitigation measures

Measures the proponent has committed to mitigate potential impacts on regulated vegetation include:

- temporary construction areas and permanent project infrastructure would be located in areas of non-remnant or least concern vegetation and as far as practicable from waterways and watercourses to minimise clearing of high value vegetation where possible
- direct impact to areas of high ecological value would be avoided or minimised through the process of corridor realignments or spanned across wherever possible via micro-siting as appropriate to the ecological values and the terrain constraints
- no transmission towers would be located within a watercourse, or its riparian zone and waterways spanned completely. In the event transmission towers need to be placed in waterways, specific design and construction requirements would be considered at these locations to minimise impacts.
- imposition of strict no go areas for workforce and equipment within remnant vegetation, with the extent of vegetation clearing identified on construction plans and, in the field, using high visibility fencing or flagging.

As part of the CEMP, the proponent has committed to identify environmentally sensitive areas to ensure more refined clearing methods are utilised within these areas. For example, where vegetation clearing or trimming would be required within and/or across watercourses to achieve transmission line conductor clearance, clearing of watercourse vegetation would be undertaken by hand to a height between 1 m and 3.5 m to maintain bank stability and to minimise erosion.

The proponent has also committed to the preparation and implementation of a rehabilitation plan as part of the CEMP. In accordance with the rehabilitation measures in the EIS, to be confirmed and updated in the rehabilitation plan, and as soon as practicable following the disturbance, the proponent would progressively rehabilitate disturbed areas not required for permanent infrastructure and operations. The EIS indicates consideration of the timing of progressive rehabilitation would be given to promote natural regeneration of disturbed areas, maximise potential of existing seedbank and minimise potential for erosion.

Site and stage-specific rehabilitation sub-plans would also be developed prior to construction which would take into consideration detailed design, staging of works, local environmental and landholder requirements and relevant conditions of approvals.

These commitments are included in Appendix 1 of this report.

5.2.3.4 Significant residual impacts and offsets

In summary and based on the information provided in the EIS, the clearance of approximately 84 ha of regulated vegetation, as outlined in Table 5.6, may result in an SRI to MSES and would require an offset to be provided.

Table 5.6 Significant residual impacts on regulated vegetation matters

Regulated vegetation matter	Significant residual impact area (ha)
'Of Concern' RE	**8.54**
Essential habitat	**40.80**
Defined distance watercourse vegetation	**34.69**

5.2.3.4.1 Essential habitat

The project's impacts on essential habitat for the Julia Creek dunnart, ornamental snake, squatter pigeon and waxy cabbage palm have been considered as impacts on these species as MNES. It is stated in Chapter 6 this report accepts the EIS conclusion that there will be:

- an SRI on the Julia Creek dunnart, ornamental snake and squatter pigeon requiring offsets under the EPBC Act
- no SRI on the waxy cabbage palm.

Impacts on these matters would be considered by the Commonwealth Minister for the Environment in their assessment of the project. This report therefore does not recommend conditions relating to offsets of SRI on MSES, where those matters are the same (or substantially the same) as those MNES considered by the Commonwealth Minister for the Environment and where the impacts assessed are also the same as those considered in this report.

While this report does not consider conditioning of offsets for MSES which overlap with MNES, the adequacy of the proponent's draft biodiversity offset management strategy (BOMS) in meeting the offset obligations of the project in terms of impacts on MSES have been considered.

The EIS considered all mapped habitat for all state listed species which is more extensively mapped in comparison to essential habitat mapping. For the purple-necked rock wallaby, the project's impact on mapped essential habitat and offset requirements have been considered within section 5.2.7 as protected wildlife habitat – fauna.

5.2.3.4.2 Regional ecosystems and watercourse vegetation

The EIS considers that the potential clearance of up to 8.54 ha of 'of concern' REs and 34.69 ha of remnant vegetation within the defined distance of a watercourse (watercourse vegetation) would result in an SRI impact requiring an offset. Based on the EIS assessment, the evaluation agrees with this conclusion. However, it is acknowledged that pre-clearance surveys and detailed design would likely reduce the requirement for clearing regulated vegetation through micro-siting of temporary construction areas and permanent project infrastructure.

Where vegetation clearing can be conducted in accordance with the Planning Regulation 2017 Schedule 21 'exempt clearing work' (Part 1 (10(a) and (b))[21] or included within the MID process, an operational works approval for vegetation clearing under the VM Act would not be required. Therefore, associated MSES offset requirements for regulated vegetation are not required on the basis that such works are exempt clearing activities and would apply broadly across the entire project area.

5.2.3.5 Coordinator-General's conclusion: regulated vegetation

Construction and operation of the project would require the clearance of up to 808.14 ha of regulated vegetation considered to be MSES. However, impact areas have been considered in the EIS as precautionary, maximum impact areas which are likely to be refined during detailed design and throughout construction. It is noted that the proponent has committed to undertake pre-clearance surveys to confirm the presence of regulated vegetation in areas to be cleared.

This report includes recommended conditions to the Planning Minister (Appendix 2, Part B) requiring the proponent to undertake a pre-clearance survey to confirm the extent of impact to regulated vegetation within the project corridor.

The EIS concluded that the project would have an SRI on 84 ha MSES, including 'of concern' REs, essential habitat and watercourse vegetation. The proponent notes that the proposed approach to the delivery of offsets, involving the confirmation of impact areas, would not be determined until detailed design has been developed and a determination of the actual on-ground extent of impacts has been completed.

This report notes that MSES offset requirements associated with an operational works approval for vegetation clearing under the VM Act would not be required where vegetation clearing can be conducted in accordance with 'exempt clearing work' or included within subsequent MID processes.

This report is satisfied that the implementation of the proponent's commitments, recommendations for the Planning Minister for proposed MID(s) and recommended conditions for the Commonwealth Minister for the Environment in this report would ensure that acceptable outcomes are achieved for impacts on regulated vegetation MSES due to the project.

[21] An activity under –
(a) the *Electricity Act 1994*, section 101 or 112A; or
(b) the Electricity Regulation 2006, section 17.

5.2.4 Connectivity areas

5.2.4.1 Background

Under the *Queensland Environmental Offsets Policy Significant Residual Impact Guideline*, connectivity areas are defined as areas of remnant vegetation outside urban areas containing prescribed REs that are required for ecosystem functioning.

The EIS considers connectivity areas are generally associated with riparian corridors of major rivers and their tributaries, including the Burdekin River, Kirk River, Campaspe River, Cape River, Reid River, Haughton River and Broughton River. Three state and regionally significant terrestrial corridors are also intersected by the project, namely, the GAB Rim, the Gulf to Grasslands and the Wet Tropics – Einasleigh Uplands corridors.

5.2.4.2 Impacts and mitigation

The project has the potential to impact on connectivity areas as it contains areas of remnant vegetation which are outside an urban area and are over 1 ha in size.

The EIS noted that the project corridor is within a highly fragmented landscape and to the greatest extent possible, the concept design has sought to minimise further fragmentation of remnant vegetation by siting infrastructure in cleared or highly disturbed areas. However, the project would still intersect several large areas of intact remnant vegetation, particularly in the Renewable Energy Hub section.

As part of the EIS, an assessment was undertaken using the DES Landscape Fragmentation and Connectivity Tool[22] to determine potential impacts on connectivity areas containing remnant vegetation as a result of the project. The assessment determined that the potential impact of the project on connectivity areas would not lead to a significant reduction in core remnant areas at a local scale (within 5 km) and therefore an SRI is unlikely.

To reduce impacts on vegetation located along major rivers and their tributaries in the riparian zone, which would provide for fauna movement, the proponent has committed to sighting transmission towers outside of all watercourses and associated riparian zones. Transmission tower locations would also allow for riparian zones to be spanned completely and would further minimise impacts by avoidance of clearing in the watercourses and incorporating appropriate buffers to these features.

Measures the proponent has committed to in the EIS in order to minimise impacts on vegetation connectivity include:

- access tracks would be restricted to already disturbed areas and construction sites including laydown areas and stockpiles limited to cleared areas
- where riparian zones contain vegetation at risk of significant disturbance from manual transmission line stringing, stringing activities will be undertaken by helicopters
- construction sites would be rehabilitated as soon as practicable after the completion of works to reconnect fragmented vegetation
- areas of high habitat connectivity (i.e. riparian zones) would be identified during detailed design through pre-clearance surveys and mitigation measures investigated to improve or restore connectivity across the project corridor.

[22] The Landscape Fragmentation and Connectivity Tool (DEHP, 2018).

In the event high levels of fauna connectivity are unavoidably impacted (i.e. for the operational safety of the network infrastructure), the proponent has also committed to retain, where possible, strips of remnant vegetation to maintain connectivity and reduce habitat fragmentation/isolation.

5.2.4.3 Coordinator-General's conclusion: connectivity areas

The EIS assessment of impacts on vegetation connectivity confirmed that the project will not change the number of core remnant areas on site and the impact on core remnant vegetation would be minimal. This report agrees that no offset would be required for this MSES value due to the minimal impacts. However, it is acknowledged that the offset area management plan required by a recommended condition for a decision on the project under the EPBC Act (Appendix 3) is to include information about how the proposed offset area/s provide connectivity with other relevant habitats and biodiversity corridors.

This report is satisfied the linear nature of the project, limited earthworks and distances between tower assembly areas and transmission tower locations would avoid loss of fauna connectivity or permanent alterations to the surrounding landscape or ecosystems.

5.2.5 Waterways providing for fish passage

5.2.5.1 Background

The EO Regulation states that any part of a waterway providing for passage of fish is a MSES only if the construction, installation or modification of waterway barrier works carried out under an authority will limit the passage of fish along the waterway.

The project corridor traverses a number of waterways that are mapped as waterways for waterway barrier works, including 28 waterways mapped as high (red) and 65 major risk (purple) under the waterway barrier works mapping. The project will also cross multiple mapped amber and green waterways and potentially waterways that are not mapped.

5.2.5.2 Impacts and mitigation

The EIS indicates that other than access tracks and temporary crossings, there are no components of the project that are defined as waterway barrier works, as transmission towers and any other ancillary infrastructure that does not have functional requirement to be within a waterway would not be constructed within any waterways.

To reduce impacts of potential barriers on fish passage, and other riparian and aquatic habitat, the EIS identified that helicopters will be used to install conductors and earth wire pull cables over waterways and transmissions towers will be strategically located to allow the corridor to span across waterways. In addition, where possible, watercourse crossings for the project would utilise existing vehicle crossings and prioritise the use of temporary water crossings during dry conditions when water is not flowing.

The evaluation notes that the proponent has committed to ensuring that any works within the bed and banks of a waterway for the project are constructed with consideration of the *Accepted Development Requirements for Operational Work that is Constructing or Raising Waterway Barrier Works* (ADR). New bed level waterway crossings (vehicle access) will be constructed within timeframes and all other design requirements, general standards and notification as specified by the ADR (i.e. within 180 days for major impact (purple) or high impact (red) waterways, or 360 days on moderate impact (amber) or low impact (green) waterways).

In the event any water crossings cannot meet the specifications within the ADR, the proponent would be required to seek a development approval. The proponent has committed to undertake a pre-lodgement

meeting with the DAF to assist in determining any works that may be triggered and identify any required approvals, including for waterway crossings.

The proponent has also committed to, during the detailed design and pre-construction phase, undertake additional waterway assessments to capture on ground physical and hydrological fish habitat attributes to confirm whether a particular drainage or waterway feature is a defined waterway that provides for fish passage.

5.2.5.3 Significant residual impacts and offsets

As the proponent has committed to ensuring that waterway crossings for the project are constructed with consideration to the ADR, it is considered that an SRI on fish passage is unlikely.

Accordingly, this report is satisfied that the project would not result in an SRI to waterways providing for fish passage provided that the proponent fulfills their commitment.

5.2.5.4 Coordinator-General's conclusion: waterways providing for fish passage

The strategic location of transmission towers will allow the corridor to span across watercourses and subsequently eliminate the need for waterway barriers. As such, this report is satisfied that the project would not result in an SRI to waterways providing for fish passage provided that the proponent fulfills their commitments.

5.2.6 Protected wildlife habitat – protected plants

5.2.6.1 Background

The EO Regulation defines 'protected wildlife habitat' as an area that is shown as:

- a high risk area on the flora survey trigger map and that contains plants that are endangered wildlife or vulnerable wildlife
- an area not shown as a high risk area on the flora survey trigger map, to the extent the area contains plants that are endangered wildlife or vulnerable wildlife.

A desktop search, including PMST and Wildlife Online databases, identified several threatened flora species with the potential to occur within the project study area and surrounds (up to 2.5 km either side of the study area). An assessment of the likelihood of occurrence (detailed further in section 6.4.1) for each flora species determined that 2 species listed under the NC Act only (c.f. those listed under both the EPBC Act and the NC Act) were recorded during field surveys and 'confirmed present', which include:

- *Acacia armitii* - 'Near threatened' under the NC Act, confirmed present within the study area
- Mount Isa mallee (*Eucalyptus nudicaulis*) - 'Endangered' under the NC Act, confirmed present within the study area.

The EIS concluded that SRI are unlikely for threatened flora species not identified during surveys and considered as 'may occur' or 'unlikely to occur' with the project corridor. The lack of historical species records combined with the survey effort undertaken by the proponent indicated that the project corridor is unlikely to support populations of these threatened flora species. The evaluation accepts this finding based on the evidence presented in the EIS.

Evaluation of potential impacts on threatened flora species listed under both the NC Act and the EPBC Act (*Acacia crombiei*, *Eucalyptus raveretiana* and *Livistona lanuginose*) have been considered in section

6.4.3 of this report. The evaluation concluded that the loss of individuals of these species (if any) is unlikely to result in an SRI due to avoidance measures committed to by the proponent.

5.2.6.2 Impacts and mitigation

The EIS estimated the project corridor would intersect approximately 132.23 ha of suitable Mount Isa mallee habitat, however as part of the concept design, the transmission towers and associated infrastructure have been sited to avoid known locations of conservation significant flora species. As such, the project is estimated to result in the maximum clearance and/or disturbance of approximately 5.37 ha of suitable Mount Isa mallee habitat.

The known distribution Mount Isa mallee is restricted to the Mount Isa – Cloncurry district of north-west Queensland and is confined to rocky gullies and steep hillsides. The EIS identified that pre-clearance surveys undertaken during the detailed design phase will inform final transmission tower placement to further avoid areas where the species may be found. Due to the undulating terrain and low sparse vegetation structure through suitable habitat, it is considered that varying tower heights and span lengths would assist in the avoidance of individual occurrences of the species and therefore minimise the need for clearing or trimming of habitat.

To manage the introduction and spread of invasive pest and weed species that could threaten threatened flora species habitat, the proponent has committed to the preparation and implementation of site and phase-specific biosecurity management plans as part of the CEMP prior to the commencement of construction which will include species-specific weed prevention, management and monitoring measures to control invasive weed species.

As *Acacia armitii* is listed as 'near threatened' under the NC Act, a significant impact assessment is not required. Despite this, the proponent has nominated avoidance and mitigation measures for potential impacts on the *Acacia armitii*, including pre-clearance surveys within known and potential *Acacia armitii* habitat in order to plan tower placement and the spanning of riparian habitat containing occurrences of the species.

5.2.6.3 Significant residual impacts and offsets

The EIS assessment determined that an SRI would be unlikely for the Mount Isa mallee as tower placement and longer spans will be effective in avoiding individual occurrences and minimising any clearing within supporting habitat.

5.2.6.4 Coordinator-General's conclusion: protected wildlife habitat – protected plants

The EIS satisfactorily identified and assessed the project's potential impacts on protected plants. The evaluation notes the proponent's commitment to undertake pre-clearance surveys during the detailed design phase and implement mitigation measures to protect any identified protected plants. These proponent commitments are reinforced through the recommendations in Appendix 2, Part B for subsequent development approval processes.

Of the 2 threatened flora species confirmed present within the study area, the *Acacia armitii* is listed as 'near threatened' under the NC Act and as such does not require a significant impact assessment. It is noted that the proponent has nominated mitigation measures to address potential impacts on species regardless of its classification.

This report considers that the project is unlikely to have unacceptable impact on protected plants, provided the proposed avoidance and mitigation measures, proponent commitments and recommendations of this report are implemented.

5.2.7 Protected wildlife habitat – protected fauna

5.2.7.1 Background

The EO Regulation defines ‘protected wildlife habitat’ as a habitat for an animal that is endangered wildlife or vulnerable wildlife or a special least concern animal.

Under the NC Act, special least concern includes least concern birds which are listed under international agreements such as the Japan–Australia Migratory Bird Agreement (JAMBA), China–Australia Migratory Bird Agreement (CAMBA), Republic of Korea– Australia Migratory Bird Agreement (ROKAMBA) and the Bonn Convention.

An assessment of the likelihood of occurrence (detailed further in section 6.4.1.3) for each threatened fauna species listed under only the NC Act (c.f. those listed under both the EPBC Act and the NC Act), determined one species was recorded during field surveys and ‘confirmed present’ and 4 species were considered ‘likely to occur’, which include the:

- Purple-necked rock wallaby - ‘Vulnerable’ under the NC Act, confirmed present within the study area
- Short-beaked echidna - ‘Special Least Concern’ under the NC Act, likely to occur within the study area
- Grey falcon - ‘Vulnerable’ under the NC Act, likely to occur within the study area
- Common death adder - ‘Vulnerable’ under the NC Act, likely to occur within the study area
- Northern-leaf nosed bat - ‘Vulnerable’ under the NC Act, likely to occur within the study area

Evaluation of potential impacts on 10 threatened fauna species listed under both the EPBC Act and NC Act (as outlined in Table 6.4) are considered in Chapter 6 of this report.

5.2.7.2 Occurrence within the study area

The purple-necked rock wallaby is largely endemic to the North-West highlands bioregion in Queensland; one of the six bioregions intersected by the project corridor (see Figure 5.4). It is most commonly found in the Mount Isa, Dajarra and Cloncurry areas within rocky habitats such as boulder piles, rocky outcrops, cliffs and gorges generally covered with dry Eucalypt and Acacia woodland with an understory of spinifex grasslands. Where possible, the project corridor alignment and infrastructure placement have been selected to avoid these rocky habitats, resulting in 28 of the 34 mapped essential habitat polygons as shown in Figure 5.5 being avoided by the project.

The purple-necked rock wallaby was recorded at 2 locations within the study area during field surveys undertaken as part of the EIS assessment and potential habitat and/or foraging habitat were observed throughout the Mount Isa Augmentation and Southern Connection sections and the eastern-most extent of the CopperString Core section. Multiple scat samples were collected, and suspected carcasses of the species were observed at numerous sites amongst the rocky outcrops and escarpments within the Ballara Nature Refuge.

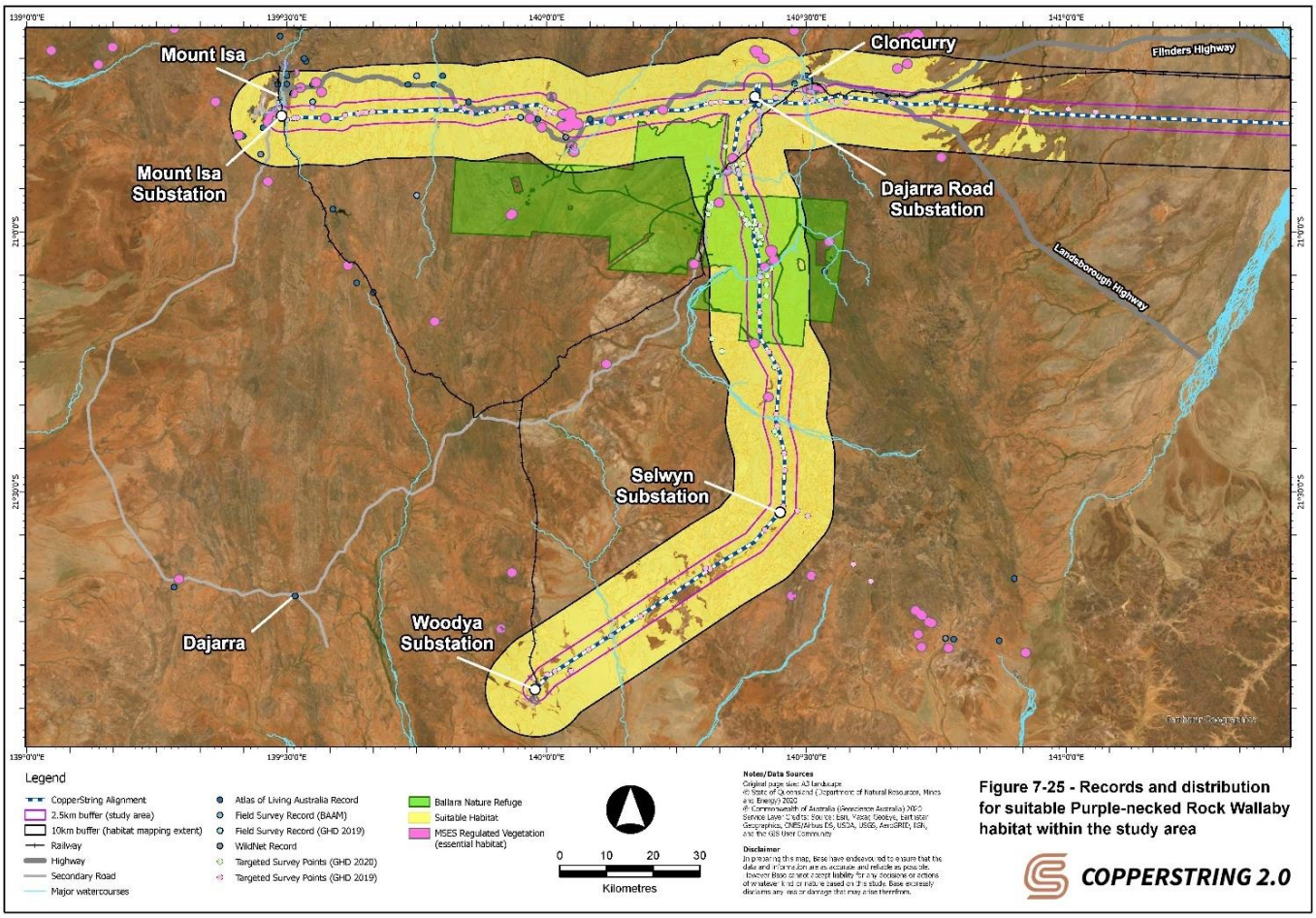

Figure 5.5 Suitable habitat mapping for the purple-necked rock wallaby within the study area[23]

The short-beaked echidna was observed during field surveys, including two observations of diggings near the Campaspe River. The EIS notes the high availability of suitable habitat throughout and surrounding the study area, including within the Ballara Nature Refuge, as the species is not a habitat specialist and is able to use a wide variety of habitat.

As of July 2020, the grey falcon was also listed as 'vulnerable' under the EPBC Act, however as the referral decision for the project (EPBC 2019/8416) was made prior, on 14 May 2019, this evaluation only considers the NC Act listing for this species. The EIS considered the species as a non-breeding, winter visitor where occasional sightings have been reported around the Mount Isa and Cloncurry areas during these periods despite it not being observed during field surveys for the EIS.

Neither the common death adder or northern leaf-nosed bat were identified during field surveys nor was evidence of their potential presence, however suitable habitat mapping indicates both species are likely to occur within the project corridor.

The EIS indicates seven conservation significant species of fish, listed under the EPBC Act or NC Act, are known to occur within water catchments intersected by the project corridor. None of these species were recorded during field surveys and were not considered as likely to occur within the project area.

No conservation significant aquatic reptile species were confirmed present within the study area during field surveys. The EIS does consider the potential for the diamond head turtle to occur within the western

[23] Figure provided by the proponent as an update to a previous version in the EIS.

extent of the project corridor though, however due to the concept design for the project, no aquatic habitat for conservation significant species is anticipated to be impacted.

No platypus, or evidence of their breeding (i.e. burrows) was encountered during the fields surveys, and due to the seasonal nature of most palustrine waterbodies in the study area, any potential habitat present along the project alignment is not likely to support a population of platypus (i.e. ephemeral with limited burrowing opportunities).

5.2.7.3 Impacts and mitigation

5.2.7.3.1 Direct impacts – clearance of habitat

Suitable habitat for the purple-necked rock wallaby, short-beaked echidna, grey falcon, common death adder and northern leaf-nosed bat is present within the project corridor. The EIS concluded that the project would result in the direct loss and/or disturbance of suitable habitat for each of the fauna species as outlined in Table 5.7.

Table 5.7 Total loss of suitable habitat for threatened fauna species within the project corridor

Fauna species	Temporary project activity – construction (ha)	Permanent project activity – operation (ha)	Total
Purple-necked rock wallaby	388.48	160.83	**549.31**
Short-beaked echidna	1274.92	331.46	**1606.38**
Grey falcon	257.09	194.47	**451.56**
Common death adder	453.88	275.97	**729.85**
Northern leaf-nosed bat	70.2	22.02	**92.04**

As noted in section 5.2.3.2, the final design, location and configuration of temporary construction activities and operational infrastructure (also referred to as micro-siting) would be informed by pre-clearance surveys prior to the commencement of construction and may allow for the further protection of species, habitat and features of conservation significance. Micro-siting would influence design optimisations and would, in consideration of local features including key habitat features, lead to a reduction in the development footprint. As such, the estimated total loss amounts of suitable habitat outlined in Table 5.7 are considered in this report as precautionary, worst case estimations which are likely to be improved during detailed design prior to the commencement of construction.

The proponent has committed to the preparation and implementation of high risk species management plans (SMPs) as part of the Flora and Vegetation Management Plan and Fauna Management Plan, for the species where the broader population is at a greater risk from impacts. The SMPs would include a standard requirement for targeted pre-clearance surveys of potential habitat within the clearing footprint and measures to limit construction activities to avoid breeding seasons of threatened species, relocate individuals identified during pre-clearance surveys by qualified and experienced fauna spotter-catchers, install fauna exclusion fencing and enforce speed limits onsite.

To further reduce the potential impacts caused by the loss of suitable habitat for construction activities and operational infrastructure, the following measures are proposed in the EIS:

- special habitat features (e.g. hollow bearing logs or trees) would be selectively removed during construction for reuse in rehabilitation efforts, or placed in nearby bushland
- construction sites, offices, soil stockpiles and equipment storage would be located in already disturbed or cleared areas to minimise disruption to wildlife habitat, where possible

- vegetation clearing would be restricted to the minimal amount necessary for the construction of the project
- areas of high ecological significance will aim to be spanned across wherever possible using higher towers (i.e. up to 75 m height) and shorter or longer spans, as appropriate to the ecological values and depending on the terrain
- all personnel to be made aware of sensitive fauna/habitat areas and requirements for protection of these areas.

The proponent has also committed to implement mitigation measures as part of the CEMP and OEMP to mitigate barrier effects on fauna movement during the construction and operation of the project, which would include measures such as targeted rehabilitation and revegetation of temporary construction areas to maintain and increase habitat connectivity and use of designated access tracks and waterway crossing points to minimise disruption to wildlife movement.

Nesting (breeding) habitat for the grey falcon was considered in the EIS to be habitat critical to the survival of the species. Despite historical records of the species being considered as a non-breeding, winter visitor individuals in the EIS, targeted pre-clearance surveys within areas suitable for breeding purposes (i.e. tall trees within the riparian zone) would ensure nest sites are avoided during construction. In addition, it is acknowledged that the placement of artificial structures (e.g. transmission towers) could provide for additional nesting habitat for this species, with recent studies reporting 40% of observed nesting for the species in artificial structures.

Despite the proposed clearance of suitable habitat for the species listed in Table 5.7 it is concluded that SRI on each species (excluding the purple-necked rock wallaby) as a result of the project is unlikely. Both the echidna and common death adder have broad habitat requirements and relatively extensive distributions and given the lack of species records within the study area; the mapped suitable habitat is unlikely to support populations.

In addition, roosting habitat for the northern leaf-nosed bat has been largely avoided due to constructability challenges associated with areas of steep hills, rocky outcrops with caves and boulder piles. The EIS noted that the project will use fauna spotter catchers during clearing activities to ensure disruptions to this species are reduced. The evaluation in this report therefore agrees that the project is unlikely to have an SRI on these species.

The EIS noted that the potential impact to breeding habitat for the purple-necked rock wallaby from vegetation clearing has been largely avoided through placement of construction activities and operational infrastructure, however foraging habitat may be impacted. The evaluation in this report agrees with the conclusion in the EIS that temporary construction activities would cause short-term disturbance to the species (i.e. localised loss of foraging habitat, dispersal to surrounding rock outcrops) and are therefore unlikely to result in an SRI. The EIS considered that the clearance of 90.77 ha of suitable habitat required for permanent operational infrastructure (transmission towers, CEV huts and substations) is likely to result in an SRI on the species, which this evaluation agrees with. Access tracks and transmission line clearing for conductor clearance have not been considered in the EIS to result in an SRI as the species is expected to utilise these areas during operation.

5.2.7.3.2 Indirect impacts

The EIS considered the increase in traffic movement during construction may have the potential to result in vehicle strike causing injury or mortality. Operation of the project is expected to generate minimal, sporadic vehicle movements unlikely to pose a significant risk to fauna. To address the increased risk of vehicle strike to fauna, the proponent has committed to the preparation and implementation of a traffic management plan for each construction site which would include measures such as designated access

routes and enforced speed limits within sensitive ecological areas including ‘go slow zones’ for vehicles and machinery where roads/tracks are located adjacent to observed breeding habitat.

The EIS discussed indirect impacts on listed threatened species, including noise and vibration, artificial lighting, increased risk of bushfire and habitat fragmentation, concluding that indirect impacts on listed species were not likely to result in significant impacts.

To limit fragmentation and reduced habitat connectivity, the proponent has committed to implement the following mitigation measures during construction within the CEMP and associated management plans:

- access tracks would be restricted to areas that are already disturbed and co-located within conductor clearance zones where possible
- locations for all major (hub) construction laydown areas, stockpiles, hardstand areas and areas needed for ancillary activities would be limited to previously cleared areas to minimise unnecessary further clearing and area footprints minimised where possible without compromising the safety and integrity of structures
- temporary construction areas (such as tower assembly areas and brake and winch sites) would be rehabilitated to grassland after the completion of construction works with natural revegetation expected to occur to reconnect fragmented habitats
- during the detailed design phase, areas of high habitat connectivity (e.g. riparian areas) that are intersected by the project would be identified and measures to improve or restore connectivity across the project corridor investigated. Measures may include the retention of vegetation between large remnant patches that retain significant habitat value.

The EIS considered that the operation of machinery and equipment during construction, such as low flying helicopters, would cause localised increases in noise and light pollution disturbances in fauna habitats within and adjacent to the project corridor. To reduce the likelihood for potential impacts from noise, vibration and light the proponent has committed to implement mitigation measures during construction and operation as part of the CEMP and OEMP such as scheduling of activities during the daytime, controlled vehicle movements and minimum sight lighting required for safety purposes.

The EIS predicted that any potential noise or light-related impact to the species would be transient and temporary due to the linear nature of the project. This evaluation agrees with the EIS that significant impacts to fauna are not expected to result from noise, vibration and light impacts for the duration of construction at each separate construction site.

The proponent has also committed to prepare and implement a weed and pest management plan which would ensure common pest species, in particular cane toads, are managed onsite to reduce potential indirect impacts on threatened species and their habitat.

5.2.7.4 Significant residual impacts and offsets

The EIS considered that only the removal of 3.92 ha of mapped essential habitat located within substation sites would result in an SRI to the purple-necked rock wallaby. No suitable habitat was mapped within CEV hut sites which, like substation sites, would require the permanent removal of vegetation with no rehabilitation. The EIS argued that all remaining project activities (temporary and permanent) would not result in an SRI for the following reasons:

- the species would experience only short-term disturbance of foraging habitat throughout the construction of the project and would continue to utilise these areas during operation as they naturally rehabilitate

- rough, rocky country that represents breeding habitat for the species has been avoided, where possible through concept design
- access tracks utilised for maintenance over the life of the project would not cause a barrier to movement for the species or lead to a substantial increase in predation
- reducing exotic groundcover in accordance with pest and weed management could allow native grass species to become more abundant and increase the quality of habitat available for the purple-necked rock wallabies within and adjacent to the project corridor.

Based on the information provided, the evaluation presented in this report does not agree with the SRI area presented in the EIS for the purple-necked rock wallaby. A larger SRI area is concluded by this report due to the following key considerations:

- a conservative, precautionary approach has been taken in estimating whether clearing impacts should be considered an SRI
- the loss of protected wildlife habitat mapped as suitable habitat has been considered as a more ecologically robust measure of habitat for the species rather than essential habitat only
- clearing of vegetation for transmission towers would result in an instant loss of habitat unlikely to be utilised by the species during operation.

This report considers that the permanent clearance of 90.77 ha of potential, purple-necked rock wallaby habitat for transmission tower, CEV hut and substation sites may result in an SRI to the species, and if so, require the provision of an offset.

Since the acceptance of the final EIS, the proponent has provided an updated draft BOMS for the project that reflects the 90.77 ha SRI area totals for this species as determined by this evaluation. These SRI area totals are considered by this report to be maximum acceptable disturbance for this species associated with the project. Updated SRI areas for each stage of construction are to be confirmed through pre-clearance surveys and during detailed design, prior to commencement of clearing activities for the relevant stage. The actual SRI would then by confirmed by a post-construction audit.

The updated draft BOMS identified where suitable offsets for this species may be provided, subject to confirmation of actual SRI impact areas. Reporting on actual SRI areas must include quality scoring for the impacted areas, to determine ultimate offset obligation in line with DES Guide to determining terrestrial habitat quality. Potential offset properties have been identified in the updated draft BOMS that would provide for offset of SRIs along the whole project.

This report recommends conditions to the Planning Minister for consideration of proposed future MID requests ((Appendix 2, Part B) including requirements for:

- defining maximum, purple-necked rock wallaby habitat disturbance limits as a result of pre-clearance surveys
- provision of offsets for any SRI for the purple-necked rock wallaby habitat
- a species management program to be prepared for species breeding places, including the purple-necked rock wallaby.

This report is satisfied with the justification provided as part of the EIS assessment that concludes the project is not likely to have an SRI on the short-beaked echidna, grey falcon, common death adder, or northern leaf-nosed bat. This report notes that offsets required for MNES threatened species, discussed in Chapter 6 of this report, are expected to provide conservation benefits to MSES threatened species habitat.

5.2.7.5 Coordinator-General's conclusion: protected wildlife habitat – protected fauna

This evaluation report is satisfied that the EIS has identified and assessed the project's potential impacts on protected wildlife habitat. This evaluation notes the proponent's commitment to undertake pre-clearance surveys during the detailed design phase and implement mitigation measures to protect any protected species habitat. This report endorses the proponent's commitments and recommends conditions for inclusions in future development applications to report on outcomes of these pre-clearance surveys and resulting updates to the project BOMS and delivery of biodiversity offsets (Appendix 2, Part B).

This report considers that the project is unlikely to have unacceptable impact on protected fauna (excluding the purple-necked rock wallaby), provided the proposed avoidance and mitigation measures and proponent commitments are implemented.

The project is expected however to result in an SRI to the purple-necked rock wallaby. I have recommended conditions to the Planning Minister requiring a species management program be developed and implemented for species breeding places, including the purple-necked rock wallaby, and that an appropriate biodiversity offset is delivered for impacts to for purple-necked rock wallaby habitat (Appendix 2, Part B).

5.2.8 Protected areas

5.2.8.1 Background

The project corridor does not intersect any national parks. The closest national park to the project is White Mountain National Park, approximately 5 km north of the project between Pentland and Torrens Creek.

The project is proposed to traverse the Ballara Nature Refuge, which is located over part of the 5 km wide study area for the project corridor between the Dajarra Road substation and the Selwyn Range, within the Southern Connection section of the project. The Ballara Nature Refuge extends over 174,916 ha, including parts of Lot 427 on Plan SW805054 and Lot 2547 on Plan SP255326.

The Ballara Nature Refuge was gazetted in 2014 over land immediately south of Cloncurry. This was after preparation of the previous CopperString Project's route selection report in 2010, upon which the Corridor Selection Report in the EIS is based.

The conservation agreement for the Ballara Nature Refuge came into effect in March 2014 and identifies a number of significant elements within the gazetted reserve boundary including the presence of threatened regional ecosystems; waterways of significance; significant non-Indigenous cultural heritage sites (such as cemeteries, and the former townships of Ballara, Hightville and Marrabah); and habitat known to support the ghost bat (Macrodema gigas) which is listed as vulnerable under the NC Act.

The EIS identified that the alignment of the project's Southern Connection section has been developed in close consultation with the Ballara Nature Refuge landholder. The landholder has confirmed with the proponent that this alignment is in the best location possible to minimise impacts to their land, it's existing use for grazing and the environmental values recognised within the Conservation Agreement. This evaluation notes advice from the proponent that the landholder has signed an options agreement for the Grant of Easement with the proponent.

The proponent undertook a route options analysis as part of the EIS' Corridor Selection Report[24] for the section of the Southern Connection which traverses the Ballara Nature Refuge. The route analysis considered five route alignment options (as shown in Figure 5.6) on the basis they resulted in:

- larger areas of impact on protected species habitat
- larger areas of impact on mapped waterways, with increased flood risks during construction and operation of the project
- safety issues associated with constructing a transmission line through longer sections of inaccessible terrain
- additional landholders and stakeholders who may be impacted
- increased costs due to alternative alignments being longer than the preferred alignment.

The preferred alignment, option 1, runs through the Ballara Nature Refuge on the eastern side of Cloncurry Dajarra Road, reducing the distance the corridor extends through the nature refuge as much as possible. This alignment also avoids steep land and rugged terrain located on the eastern side of Cloncurry Dajarra Road and the Mount Isa Rail Line and therefore can be largely constructed without the need to undertake unnecessary vegetation clearing for construction activities and operational infrastructure (i.e. aerial construction methods through steep hills and ridge lines).

The EIS concluded that the preferred alignment through the Ballara Nature Refuge would have fewer impacts on habitat values, existing utilities and infrastructure, has landowner support, is preferable from a constructability and safety perspective and is more cost-effective. This conclusion, and the minimisation of potential impacts for this part of the alignment, is supported by the evaluation presented in this report.

This evaluation considers the EIS has adequately investigated the feasibility of alternative corridor route alignments and subsequently demonstrates that the corridor selection through the Ballara Nature Refuge cannot be reasonably avoided and has been situated to ensure the least ecological impact.

This evaluation further acknowledges that the construction and operation of the project is not permitted within the Ballara Nature Refuge until such time the revocation of part of the protected area intersected by the project corridor is approved and a variation or replacement of the conservation agreement to reflect the redefined boundary is agreed to by the parties bound by the agreement. The proponent has advised that consultation with the DES and the private landowner is underway.

The DES have advised that:

- DES has been engaged in consultation with the Ballara Nature Refuge landholder regarding the potential for changes to the existing conservation agreement, requiring replacement of the current agreement
- negotiations with the Ballara Nature Refuge landholder are expected to progress on a replacement conservation agreement following release of this report
- the negotiations for a replacement conservation agreement are contingent on an area of equal or greater size and environmental value being added to the gazetted nature refuge to prevent any net loss of it values.

[24] Refer Appendix C within Corridor selection report, EIS Volume 3, Appendix D, available via: **https://eisdocs.dsdip.qld.gov.au/CopperString/2019/dEIS/Volume-3-AppendixD-Corridor-selection-report.pdf**.

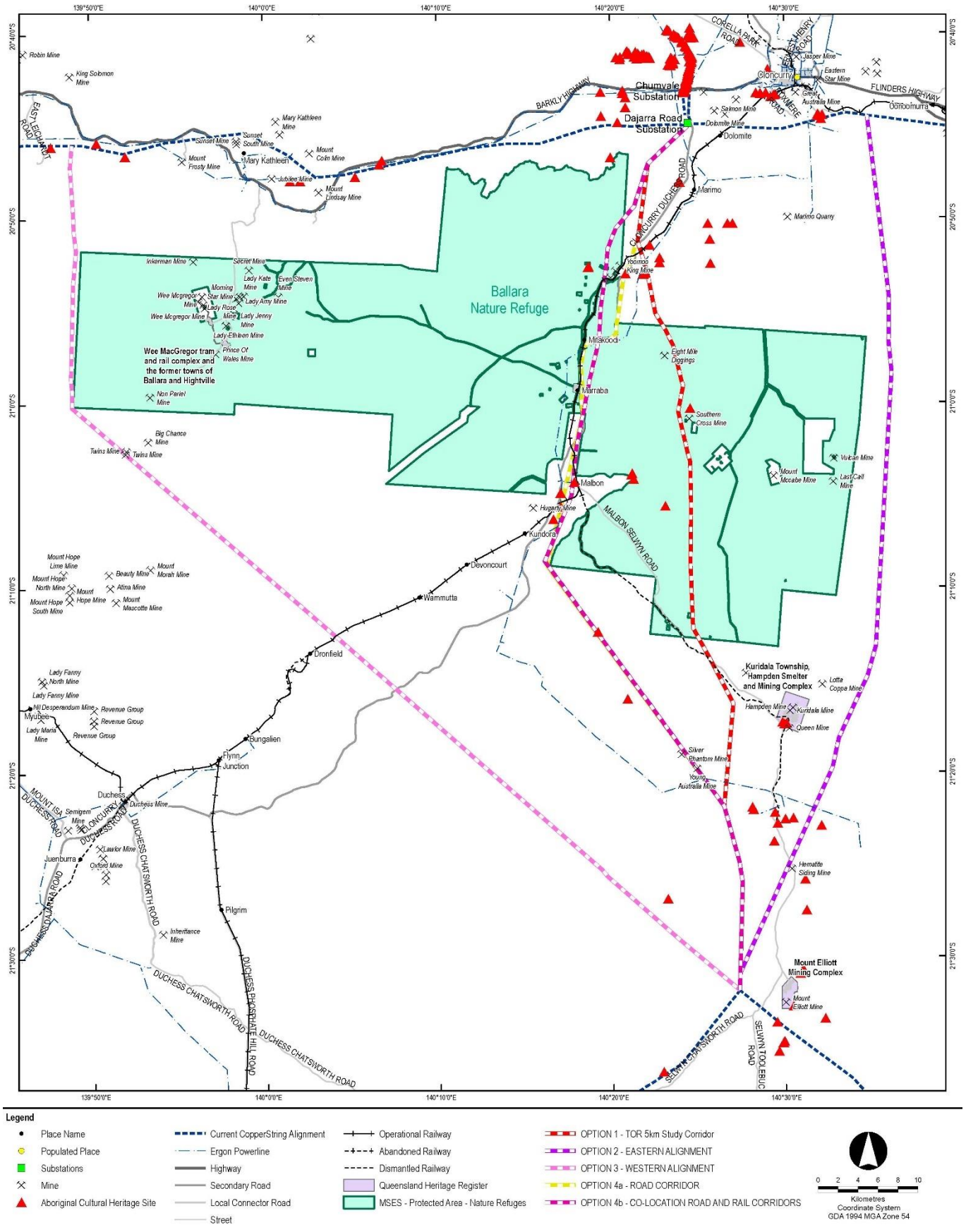

Figure 5.6 Ballara Nature Refuge alternative route alignment options[25]

5.2.8.2 Impacts and mitigation

The project corridor intersects approximately 191.52 ha of the Ballara Nature Refuge. As highlighted in Table 5.4 of section 5.2.3, 'of concern' RE 1.11.7 is intersected by the Southern Connection section of the corridor. Of the 24.19 ha of RE 1.11.7 impacted by the project, 2.97 ha is located within the Ballara Nature Refuge. The EIS considered that no 'endangered' REs, essential habitat or regulated vegetation within a defined watercourse located within the Ballara Nature Refuge would be impacted by the project.

The Cloncurry River is recognised in the conservation agreement as a significant refugia point for native fauna. The project corridor intersects the Cloncurry River at one location within the Ballara Nature Refuge, though the EIS indicated the river would be spanned across using natural elevation on the side of a hill avoiding and/or minimising disturbance to riparian vegetation and to the natural water flows and processes.

As noted above, the Ballara Nature Refuge contains roosting habitat (deep caves or disused mines) known to support the ghost bat, however it is concluded in the EIS that there are no known roost sites within the project corridor nor was evidence of the species potential presence observed during field surveys. As such, the evaluation within this report agrees with the conclusion in the EIS that the project would not impact this species.

The EIS indicated the conservation significant fauna species with potential to occur within the Ballara Nature Refuge include the purple-necked rock wallaby, short-beaked echidna and the night parrot. The project's impacts on the purple-necked rock wallaby and short-beaked echidna have been considered in sections 5.2.3 and 5.2.7 above and impacts to the night parrot have been considered as impacts on the species as MNES in Chapter 6.

5.2.8.3 Significant residual impacts and offsets

The MSES protected matters relevant to the project defined by the EO Regulation that traverse the Ballara Nature Refuge are discussed in sections 5.2.3 to 5.2.8.

The updated draft BOMS prepared by the proponent since the EIS identifies that an offset area would be required as a replacement for any revoked portions of the Ballara Nature Refuge (loss of a protected area), in addition to the offsets required for SRI on MSES and MNES protected matters.

This report recognises that the predicted impact on values protected within the Ballara Nature Refuge is a key matter for the project and makes a recommendation to the Planning Minister in Appendix 2, Part B that the proponent report on consultation progress with the Ballara Nature Refuge landholder in the relevant MID request. In addition, recommendations are made on the offset obligation for impacts to the Ballara Nature Refuge, recognising the proponent's commitments and updated draft BOMS.

5.2.8.4 Coordinator-General's conclusion: protected areas

The EIS has satisfactorily identified and assessed the project's potential impacts on protected areas, namely the Ballara Nature Refuge, with options for avoidance or minimisation of impacts being fully considered. It is acknowledged that separate discussions would be progressed between the landholder for the refuge and DES regarding expected replacement of the Ballara Nature Refuge conservation agreement in recognition of the project impacts. Further, the proponent has identified in the updated draft BOMS that an offset for the entire area of the Ballara Nature Refuge intersected by the project would be provided, with recommendations for offsets for the project provided in Appendix 2, Part B.

[25] From the project EIS, Volume 3.

5.2.9 Wetlands and groundwater dependent ecosystems

5.2.9.1 Background

The EO Regulation defines MSES wetlands as a wetland in a wetland protection area or a wetland of high ecological significance (HES) shown on the map of referable wetlands, or a wetland in high ecological value waters.

The EIS identified two MSES wetlands of HES and their wetland protection area (WPA) buffers within the Renewable Energy Hub section of the study area for the project corridor. The project corridor intersects the WPA buffer of one HES wetland for approximately 700 m but does not intersect the HES wetland itself which is located 350 m southeast of the project corridor. The other MSES wetland of HES and its WPA buffer is located 1 km south, and outside of, the project corridor.

All other wetlands within the project corridor are considered wetlands of general ecological significance (e.g. an active riverine spring wetland in the Fountain Complex). This report is satisfied that there are no wetlands of HEV waters within the project corridor.

5.2.9.1.1 Groundwater dependent ecosystems

The EIS assessed the presence of potential groundwater dependent ecosystems (GDEs) within and surrounding the project area and confirmed a number of surface, terrestrial and subterranean GDEs are traversed by the project corridor.

The GAB, being the most significant groundwater reserve within the project area, contains discharge springs (wetlands) of conservation significance as they provide a habitat in distinctive arid regions for endemic species including fish, invertebrates and plants. However, no active discharge springs were observed during the field surveys for the project.

5.2.9.2 Impacts and mitigation

The project would result in the removal or modification of approximately 4.7 ha of the WPA identified within the Renewable Energy Hub section. The EIS confirmed during field surveys the presence of 'of concern' RE 10.4.7 (*Casuarina cristata* open woodland on Cainozoic lake bed) within the WPA, however the area of the WPA intersected by the project area was observed to contain only regrowth Acacia habitat. The EIS concluded that due to the distance to the HES wetland area (approximately 350 m away) and the low impact earthworks proposed within this area, it is not anticipated direct or indirect impacts would occur due to the project.

The EIS identified that the project is unlikely to result in leaks/spills that would result in serious environmental harm to watercourses and or wetlands surrounding the project area as transmission towers and associated construction materials would be located outside of these areas. Potential impacts would be managed through the implementation of measures outlined in a water quality management plan and erosion and sediment control plan, as discussed in section 5.3. The proponent has also committed to storing potential hazardous substances in contained areas and the development and implementation of emergency response protocols and procedures in the event of a contaminant spill or leak.

This report is satisfied that the EIS has adequately assessed both the potential direct and indirect impacts on wetlands and note that the proponent has commitment to avoid disturbances within sensitive areas mapped as wetlands (i.e. no high impact earthworks in HES wetlands).

In accordance with the description of 'micro-siting' detailed in Appendix 5, the siting of non-linear temporary construction activities (i.e. tower assembly areas, brake and winch sites etc.) and permanent

electricity infrastructure (e.g. transmission towers, substations and CEV huts) would not be permitted to occur within 20 m of areas containing HES wetlands.

5.2.9.2.1 Groundwater dependent ecosystems

The EIS noted that surface and riverine-associated GDEs will be avoided by the project through the spanning of bed and banks of waterways by the transmission lines and use of existing crossings and access tracks. Further, permanent infrastructure will not be placed within these riverine and wetland communities due to the incompatible hydrological nature of these landforms. The EIS concluded that the project is unlikely to have impacts on groundwater resources in general, therefore is also unlikely to affect subterranean GDEs. This report supports the EIS conclusion.

5.2.9.3 Significant residual impacts and offsets

Based on the information provided in the EIS, it is considered that the removal of 4.7 ha of the WPA of a HES wetlands is unlikely to result in a significant residual impact to MSES wetlands. No impact is considered likely to GDEs.

5.2.9.4 Coordinator-General's conclusion: wetlands

Based on the information provided in the EIS, the project would not result in a significant residual impact to MSES wetlands or GDEs. The EIS provided a comprehensive assessment of indirect impacts on the wetlands which would not be disturbed. Impacts on the wetlands would be avoided or appropriately managed by the proponent's implementation of commitments, CEMP and OEMP.

5.3 Water resources

Section 9 of the EIS provides the proponent's assessment of impacts on water resources, including surface water, groundwater and flooding regimes, that are associated with the construction and operation of the project. This section evaluates the potential project impacts on water resources and the proponent's proposed mitigations and management strategies.

5.3.1 Existing environment

5.3.1.1 Surface water

The project crosses several large water catchments, with several river systems draining from these catchments. The major river systems within these catchments are:

- Haughton River
- Burdekin River
- Cooper Creek
- Flinders River
- Leichardt River
- Georgina River.

An overview of the water catchments and watercourses the project traversers is provided in Figure 5.7 below.

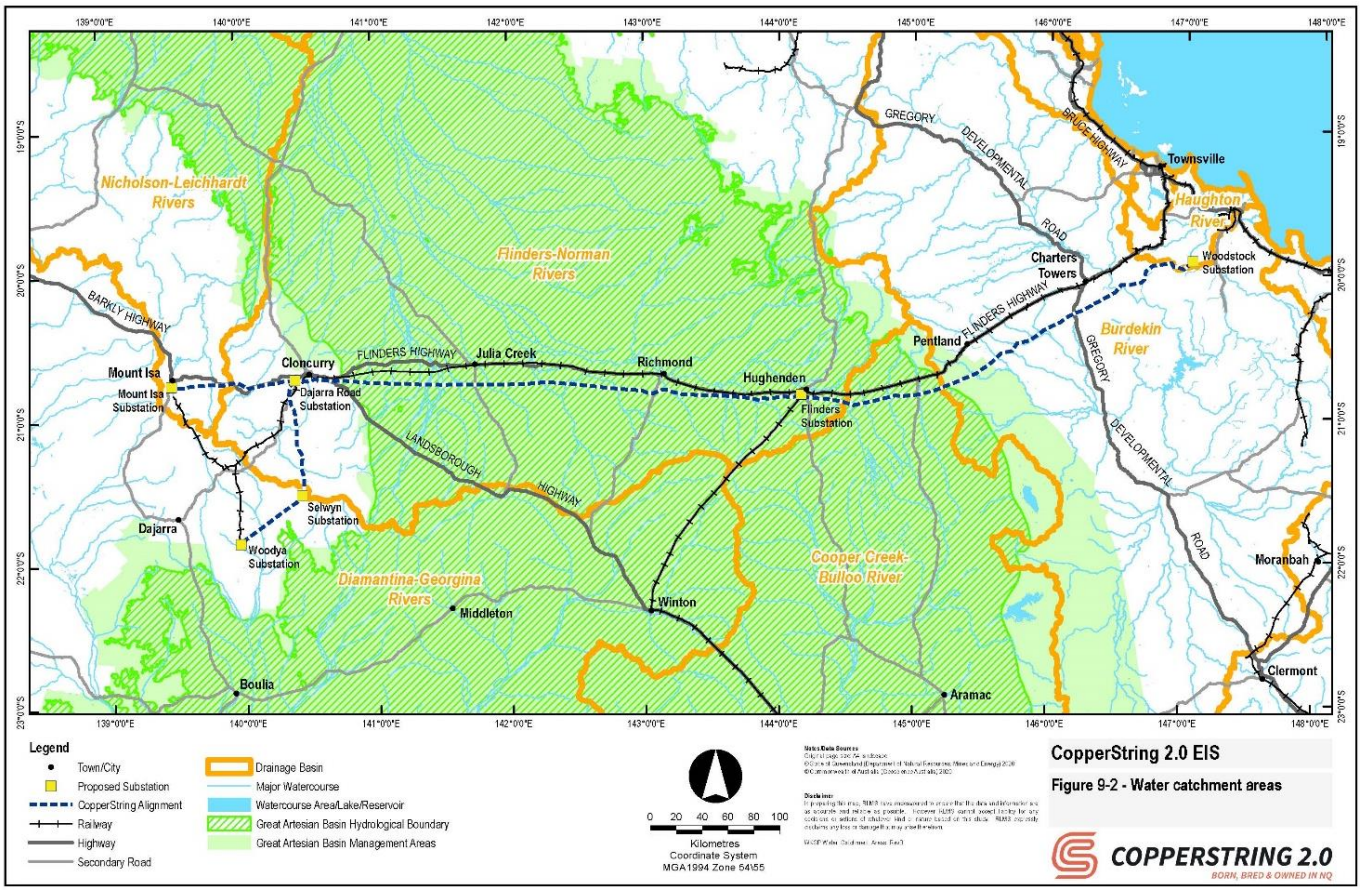

Figure 5.7 Overview of water catchments and watercourses[26]

The project traversers the following catchments: Burdekin Basin, Cooper Creek Basin, Gulf Basin and the Georgina and Diamantina Basin. These catchments are managed by water plans under the *Water Act 2000*.

The project traverses a total of 60 watercourses, with some watercourses traversed multiple times. The watercourse types include rivers, creeks, streams and drainage features and have been identified through the State Government watercourse identification mapping.[27] The corridor alignment does not intersect any downstream limits, lakes and/or springs as identified on the watercourse identification mapping.

The revised draft EIS identifies that the project traverses mapped waterways for waterway barrier works under the *Fisheries Act 1994* that are considered high risk (red) in 28 locations and considered major risk (purple) in 65 locations.[28] These waterways were identified through the Queensland waterways for waterway barrier works spatial data.[29]

The EIS identified that the majority of sites visited during field surveys near the proposed project corridor displayed evidence of disturbances and degradation by cattle (e.g., weeds, erosion, and reduced water quality). The majority of sites surveyed were ephemeral and contained isolated pools or were dry. The EIS observed channel characteristics at potential crossing locations were observed to be consistent across the project area, with larger high-order creeks and rivers characterised by wide, sandy channels with moderately high banks and occasional braided channels and wetlands associated with the main

[26] From the project EIS, Volume 2, Chapter 9. Updated version provided by proponent for this report
[27] **https://qldglobe.information.qld.gov.au/**
[28] Revised draft EIS Attachment E – Revised MNES and MSES, Table 18-12 Waterways for waterway barriers works crossings
[29] **https://qldglobe.information.qld.gov.au/**.

watercourse. Smaller, low-order creeks were typically characterised by a series of braided channels and relatively low banks.

The EIS identifies a number of significant surface water storages in proximity to the project corridor, including:

- Burdekin Falls Dam
- Burdekin Weir
- Chinaman Creek Dam (provides water supply for Cloncurry)
- Lake Corella
- Lake Mary Kathleen
- Lake Julius (provides water supply for Cloncurry and Mount Isa)
- Lake Moondarra (provides water supply for Mount Isa)
- Rifle Creek Dam.

Smaller dams, weirs, lagoons, waterholes and bores are also common across the project alignment and the water extracted is used for a variety of purposes. Other water sources for towns comprise of the Charters Towers Weir on Burdekin River for Charters Towers and Cloncurry River Wells supplying Cloncurry.

Section 5.2.9 of this report provides information on the wetlands, springs and groundwater dependent ecosystems and the relevant impact assessment.

5.3.1.2 Groundwater

The project corridor traverses a variety of hydrogeology and groundwater reserves. The GAB, underlies nearly 50% of the project from Pentland to Cloncurry, with these water resources managed and allocated through the *Water Plan (GAB and Other Regional Aquifers) 2017* under the *Water Act 2000*. The western area of the project (i.e. west of Cloncurry) is underlain by multiple sub-artesian groundwater resources, from a variety of rock forms and floodplain alluviums.

Groundwater, including the GAB, is used as a water supply source for the towns of Pentland, Torrens Creek, Prairie, Hughenden, Richmond, Maxwelton, and Julia Creek in the vicinity of the Woodstock to Dajarra Road section of the project. The EIS identified numerous registered groundwater bores within and in proximity to the project corridor, with the primary use of these bores for domestic and stock watering purposes.[30]

5.3.1.3 Flooding and flow dynamics

The EIS identified approximately 185 km of floodplain crossings along the project corridor, spanning multiple large floodplains including the Leichardt River, Flinders River and Burdekin River Basin floodplains. The most notable floodplain crossed is along the Flinders River, with the project corridor crossing an area of floodplain approximately 70 km wide.

Most of the major waterways traversed are ephemeral in nature, where flows are experienced only during the wet season (i.e., 4 to 5 months of the year). Outside of the wet season, these waterways are virtually dry with minimal flow.

[30] Draft EIS Volume 2, Chapter 9, Figure 9-4 Registered groundwater bores.

The flood risk assessment in the EIS undertook a desktop assessment and estimated the average flow velocities for the river/creek crossings as:

- for a 1% annual exceedance probability (AEP) event varying from less than one metre per second (m/s) to 2.5 m/s
- for 0.5% AEP event the average flow velocities can vary up to 4.2 m/s.

The highest average flow velocities are generally localised in the main river channels.

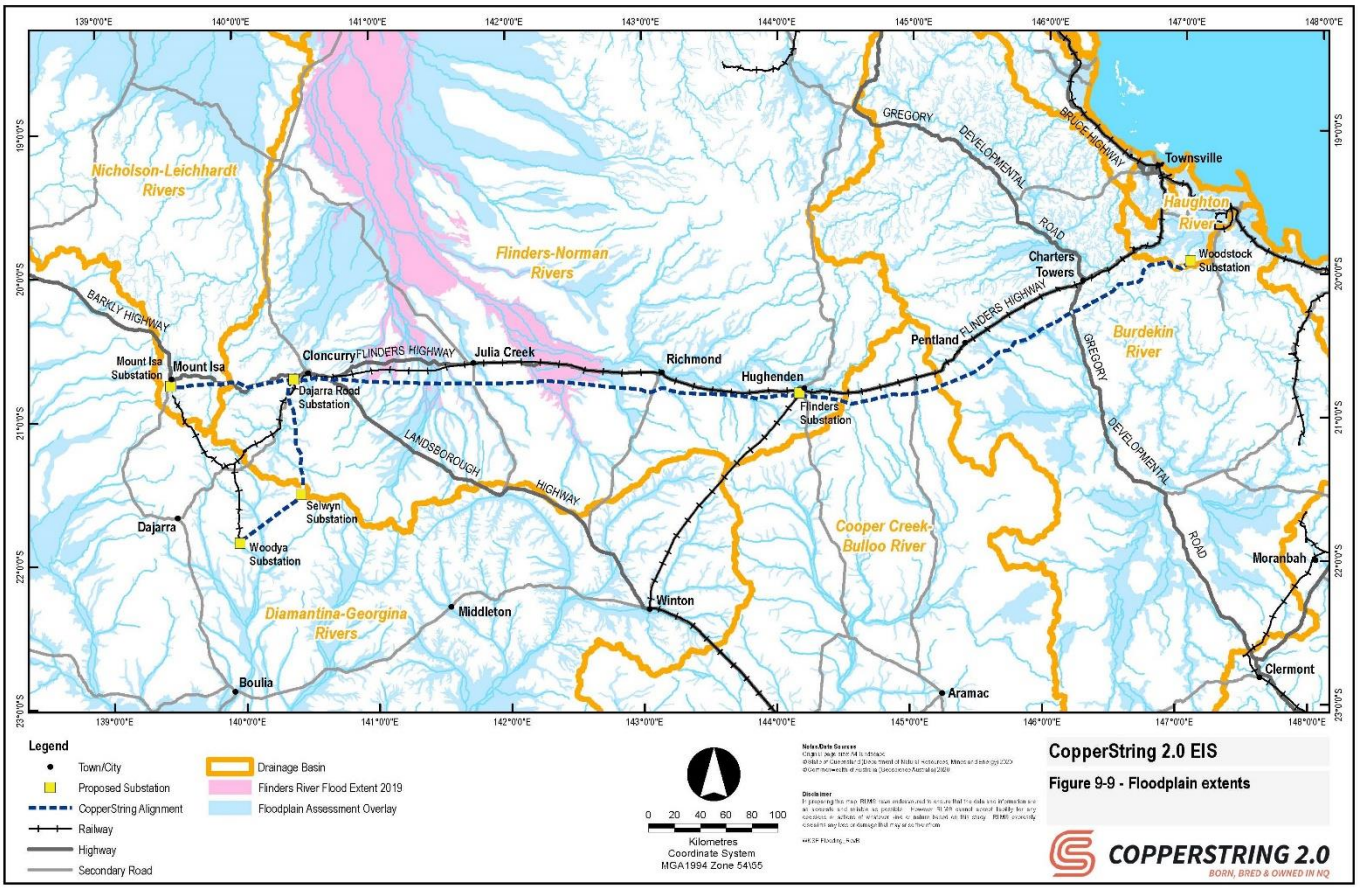

Figure 5.8 Overview of the floodplain extents[31]

5.3.2 Submissions

The key issues regarding water resources raised in submissions on the EIS include:

- the need for further consideration of environmental values and water quality objectives under the Environmental Protection (Water and Wetland Biodiversity) Policy 2019 (EPP Water and Wetland Biodiversity) for water resources impacted by the project
- potential impacts to water quality and flow, and consideration of mitigation action effectiveness, including monitoring upstream and downstream, salinity and other contaminants management, and erosion and sediment control measures
- the need for further detail on the construction activities, such as crossings potentially impacting on waterways, waterways providing for fish passage and any required waterway barrier works approvals

[31] From the project EIS, Volume 2, Chapter 9. Updated version provided by proponent for this report.

- potential impacts relating to water supply for the project, particularly during construction, and mitigation actions including developing a Construction Water Plan identifying sources of water and associated approvals, and consultation with relevant state agencies, local government, landholders and water users
- the need for further flood modelling risk assessment that considers project design, assesses impacts to surrounding properties and infrastructure, including the railway corridor, and provides mitigation measures
- further detail on any sewage treatment plants (STP) proposed and any approvals required.

This report has considered each submission received and the responses provided by the proponent in evaluation of the project. Assessment of key matters is provided below.

5.3.3 Methodology

A desktop search and review of data sources was undertaken for available groundwater, surface water and flood data, including an assessment of the extent of waterways, watercourses, floodplains and groundwater resources potentially impacted by the project.[32]

The EIS notes the Burdekin and Haughton catchments under the EPP Water and Wetland Biodiversity have draft environmental values and water quality objectives, however there are no finalised and scheduled environmental values or water quality objectives for the other catchments traversed by the project. For the other catchments, the EIS sets the environmental values for the assessment based on a review of the then Environmental Protection (Water) Policy 2009 (Water Policy) and the EPP Water and Wetland Biodiversity for Queensland waters and further adapted from the draft environmental values for the Burdekin Basin. The environmental values identified from the then Water Policy and the EPP Water and Wetland Biodiversity that were relevant to the project are aquatic ecosystem, stock watering and cultural values.

Waterway assessments were also undertaken in accordance with modified Australian River Assessment System criteria and cross referenced with GIS based imagery to identify waterway conditions, disturbances and constraints to access.

An impact assessment was then undertaken to identify potential impacts to water resources and provide potential mitigation measures, with consideration of relevant State legislation, codes and guidelines for water resources.

Hydraulic flood modelling was not undertaken in order to determine flood levels, instead existing flood inundation data was sourced from the Queensland Government QSpatial Catalogue and analysed against the project corridor and a high level desktop flood risk assessment was undertaken to generate an approximate estimate of peak flood flows and provide recommendations for future modelling. This desktop assessment was provided in the revised draft EIS in response to submissions.[33]

While the methodology is considered to be sound, the assessment will need to be refined as the exact location of infrastructure would be finalised during detailed design.

[32] Draft EIS Volume 2, Chapter 9, section 9.2.2
[33] Revised draft EIS, Attachment J – Additional information flooding.

5.3.4 Impacts and mitigation

5.3.4.1 Construction activity impacts

The EIS identified that the majority of potential impacts to water resources would be likely during the construction phase from vegetation clearing and mulching, construction and maintenance of access tracks, earthworks including stockpiling of soils and extraction of riverine materials, and construction of transmission towers, substations, CEV huts, construction camps and laydown/delivery areas.

The EIS indicates that other than access tracks and temporary crossings, there are no components of the project that are defined as waterway barrier works.

Potential impacts to water resource and water quality due to construction activities identified in the EIS include:

- erosion and sedimentation from exposed soils or scouring causing elevated turbidity and total suspended soils (TSS)
- surface/groundwater contamination from accidental spills/leaks from plant and equipment, poor water quality used in dust suppression or concrete waste from footing constructions
- nutrient runoff (i.e., from mulch stockpile leachate) or organic material (i.e., from mulch material or other cleared vegetation) entering surface waterways, impacting on water quality and stimulating algae and aquatic plant growth
- effects on terrestrial and aquatic flora and fauna due to potential impacts on water quality
- modification of surface water feature terrestrial and aquatic fauna habitat due to deposition of sediment from erosion and sedimentation
- extraction and use of surface water feature riverine material (e.g. sand, aggregate) affecting existing users' extraction rights
- altered surface water and groundwater flow regimes affecting existing water users' rights (i.e., entitlement holders and stock and domestic users), or ecological processes and cultural values (i.e. environmental values and water quality objectives).

Mitigation measures proposed in the EIS to lower the risk of these impacts are provided below.

5.3.4.1.1 Mitigation of infrastructure siting impacts

The EIS notes that planning and design response measures would provide the most impact mitigation. The exact, final location and parameters for each individual tower has not been defined in the EIS, instead, general specifications for transmission tower design and location were described. Where the project corridor crosses large channel river systems (braided ephemeral systems), the EIS provided detail of the exact location and parameters for individual towers tower sites. In these circumstances the tower sites have been individually selected to avoid existing channels and the tower design would be sufficient to withstand seasonal flows or larger flooding events.

The proponent has committed to finalise the location of all transmission towers and associated infrastructure that could impact on water resources during detailed design, after consideration of all physical constraints. This would be informed by engagement with landholders, relevant local government authorities and state agencies. Access tracks, stockpiles and laydown/delivery areas would be located as far as practicable from important wetlands, waterways and drainage lines.

Where infrastructure must cross waterways, areas of existing disturbance (i.e. existing tracks or clearing) will be used and crossings will be designed in accordance with the accepted development requirements

for operational work that is constructing or raising waterway barrier works to reduce the impacts of potential barriers on fish passage, and other aquatic species. The proponent has also committed to undertake additional waterway assessments to capture on ground physical and hydrological fish habitat attributes to confirm any defined waterways that provide for fish passage.

Where any works within waterways cannot meet the accepted development requirements, a development approval will be required. Pre-lodgement meeting/s with DAF would assist in determining specific works that may be triggered and identify required approvals, including for waterway crossings.

Other specific mitigation measures identified in the EIS include:

- transmission towers and associated construction materials would be located outside of active watercourses and wetlands where avoidance is achievable
- with the exception of access track construction, project infrastructure construction would not require bank modification (i.e., extraction or placement of fill material) within waterways
- establishing and implementing a Water Quality Plan that includes water quality outcomes as part of the CEMP, with monitoring upstream and downstream of waterway crossings.

To mitigate potential impacts, the EIS notes the following requirements for access tracks:

- new on easement and off-easement access tracks would be selected to avoid establishing multiple crossings of the same waterway where possible
- where crossings are required, existing crossings would be used in preference, with agreement of the landholder
- any new crossings would be constructed during dry or low flow periods, where practicable
- access tracks would be a six-metre-wide bed level crossing and at right angles to water flow
- access tracks would be constructed to not undermine the existing natural bank stability and positioned to minimise potential interruption of low flow conditions and scour or erosion.

The potential impacts associated with infrastructure siting are considered minimal following application of the above mitigation measures.

This report includes a recommendation in Appendix 2, Part A that reinforces the proponent's commitment to consult landholders, relevant local government and government agencies, including DAF, as necessary to inform the project detailed design. This report includes additional recommendations (Appendix 2, Part B) to ensure a Water Quality Management Plan is included as part of the CEMP and includes the mitigation works and actions identified in the EIS and listed above, to mitigate potential impacts of the project on water quality. The Water Quality Management Plan is also to include mitigation works and actions to mitigate the potential impacts to water quality from high nutrient runoff or organic material entering surface waterways, potential impacts to terrestrial and aquatic flora and fauna, and potential impacts from surface/groundwater contamination.

The Water Quality Management Plan would be prepared prior to commencement of construction and implemented during construction.

5.3.4.1.2 Mitigation of erosion and sedimentation impacts

To mitigate potential impacts from erosion and sedimentation on water resources, the proponent has committed to develop and implement an Erosion and Sediment Control Plan (ESCP) as part of the CEMP that considers the International Erosion Control Association's Best Practice Erosion and Sediment Control Guidelines (IECA, 2008). The ESCP would include erosion and sediment control

measures for onsite drainage, stormwater runoff control, vegetation clearing, earthworks, salinity risks, site exit and egress points and soil stockpile management.

The proponent has also committed to:

- minimise ground disturbance by using existing cleared areas where practicable
- retain riparian vegetation where practicable to maintain bank stability
- using aggregate required for construction activities from existing authorised suppliers and no new sources of aggregate from water features (i.e., riverine material) considered for the project
- develop a Rehabilitation Plan for temporary construction sites and cleared areas that includes rehabilitating disturbed areas as soon as practicable to limit exposure to erosive processes.

The EIS identifies the key measures to mitigate potential erosion and sedimentation impacts associated with vegetation clearing and earthworks. These consist of avoiding or minimising vegetation clearing and general land disturbance, and avoiding or minimising construction activities during the wet season (where risks are greatest). Other specific mitigation measures include:

- restrictions when clearing in riparian areas, such as felling by hand where clearing would be required or spanning the transmission line over taller vegetation when crossing wider watercourses
- progressive rehabilitation to ensure construction areas are closed prior to the wet season
- stockpiles of topsoil and spoil to be stabilised or protected using erosion and sediment control devices and not located in or adjacent to drainage lines or areas where eroded material can enter surface water bodies.

Section 5.2 of this report provides additional information on commitments to mitigate potential impacts on regulated vegetation.

The potential impacts related to erosions and sedimentation are considered minimal following application of the above mitigation measures.

The proponent's commitments to prepare in the ESCP and the Rehabilitation Plan and implement the mitigation works and actions within the plans are reinforced by recommendation(s) in Appendix 2, Part B in this report. This report also includes additional recommendations (Appendix 2, Part B) to ensure the specific mitigation measures identified in the EIS are included as mitigation works and actions in the ESCP and that the ESCP should also include mitigation works and actions to mitigate the potential impacts due to modification/removal of surface water feature terrestrial and aquatic fauna habitat.

5.3.4.1.3 Mitigation of spills and contaminants impacts

The proponent has committed to develop and implement a CEMP that would include standards for storage of fuels and hazardous materials and rehabilitation measures for areas that are temporarily disturbed to remove potentially hazardous stored substances and remediate any contaminated areas. These measures would mitigate potential impacts from spills and contaminants on water resources. The proponent has also committed to transporting, storing, using and disposing of potentially contaminating substances in accordance with manufacturers specifications, legislative requirements, Australian Standards and industry best practice, as well as maintaining a register of all hazardous materials and providing appropriate training to staff and contractors.

Other specific mitigation measures identified in the EIS include:

- the bulk storage of hazardous and non-hazardous materials would primarily be at designated laydown/delivery areas which would include designated refuelling and washdown areas to contain contaminating activities and substances and prevent unauthorised release to the environment

- the main power transformers would be designed with oil containment bunds and oil interception systems to minimise risk of oil spill and biodegradable oil may be used where feasible
- transformers and other equipment would be designed to avoid the need for fire water deluge systems.

The potential impacts related to spills and contaminants are considered minimal following application of the above mitigation measures.

The proponent's commitment to prepare and implement the CEMP, including the mitigation measures described above during the construction phase of the project is reflected in the recommendations Appendix 2, Part B.

5.3.4.2 Flooding and stormwater impacts

The siting of infrastructure and construction activities are identified in the EIS as having the potential to impact on flooding regimes and create stormwater risks along the project corridor. The following potential impacts are identified in the EIS:

- direct damage or loss of project infrastructure due to a flood event, leading to function loss or outages along the transmission line, which may impact on the capacity on the electrical grid
- cumulative impacts of multiple project activities including removal of riparian vegetation, surface hardening, changed stormwater flows associated drainage
- alteration of existing flood/stormwater behaviours which may impact on local or state controlled roads and railways or other adjoining properties and their buildings and infrastructure.

Mitigation measures proposed in the EIS to lower the risk of these impacts are provided below.

5.3.4.2.1 Mitigation of flooding and stormwater impacts

To mitigate potential impacts from flooding and stormwater, the proponent has committed to develop and implement a Stormwater Drainage Management Plan as part of the CEMP and to design the temporary and permanent infrastructure with industry standard stormwater controls.

The proponent has also committed to structuring the construction program so that, where possible, peak construction activities in areas susceptible to flooding are programmed to occur outside of forecast seasonal wet weather period, and to locate permanent infrastructure away from flood prone areas where practicable or provide appropriate flood immunity in accordance with design requirements.

The EIS stated the project infrastructure is not expected to result in changes to existing flood levels and included a high-level desktop flood risk assessment to provide guidance on flood risks and recommendations for flood modelling to be undertaken during detailed designs.

Other specific measures identified in the EIS to mitigate potential impacts from flooding and stormwater include:

- only transmission tower pads and lattice tower structures would be placed in existing flood plains or near waterways subject to seasonal flooding and would be designed to withstand expected flooding patterns and not result in scouring effects
- project infrastructure would be designed and construction with the required flood immunity depending on the infrastructure type and the implemented stormwater management controls; this would typically be to either a 1% or 0.5% AEP event
- substations would be designed to accommodate stormwater drainage, with drains, pits and culverts installed as necessary to control the flow of stormwater from the substation footprints.

The potential impacts on flooding and stormwater are considered minimal following application of the above mitigation measures.

The proponent's commitment to prepare a Stormwater Drainage Management Plan is reinforced by the recommendations in Appendix 2, Part B of this report. The Stormwater Drainage Management Plan would include the mitigation measures identified in the EIS and would be implemented during construction and operation.

This report also includes recommendations (Appendix 2, Part A) to report on outcomes of detailed hydraulic modelling, to be undertaken during the detailed design phase, in any MID request(s). The modelling is to confirm that project activities would not adversely impact on the safety and efficiency of local or state controlled roads and railways, on adjoining properties and their buildings and infrastructure. These matters are discussed further in section 5.4.

5.3.4.3 Water supply impacts

The EIS identified that water supply would be required during the project construction for activities including concrete batching, dust suppression, soil conditioning for compaction, cleaning of insulators to remove particulates and dust, construction camps (including for fire-fighting requirements), and site offices.

The EIS notes that, with the exception of the Chinaman Creek Dam, significant water storages are unlikely to be impacted by the project alignment due to separation distance. The site of the Dajarra Road substation is located within the Chinaman Creek Dam catchment, approximately 5 km from the Dam itself.

Potable water for supply to construction camps and site offices would be sourced from existing local government council supplies where capacity is available. The EIS assessed the existing local government council supplies and concluded that the use of town water during project construction would have minimal impact on existing groundwater resources relied on for town water supplies.

5.3.4.3.1 Mitigation of water supply impacts

To mitigate potential impacts from water supplied during construction, the proponent has committed to develop a Construction Water Plan in consultation with DRDMW. The Construction Water Plan would include all sources of taking water, identifying locations where water would be acquired from, amount of water (outlining maximum limits), locations of potential water interference, and any new or modified works that would capture overland flow and associated approvals. The Construction Water Plan would reference the relevant water plan under the *Water Act 2000* for each project section and would also include water resource objectives and mitigation controls.

The proponent has committed to consult with DRDMW, local government and landholders regarding the use of existing licences and authorised water sources during construction, including the use of existing or new bores.

Other measures proposed in the EIS to mitigate potential impacts related to the supply of water for construction include:

- water required for concrete batching is to be sourced from existing appropriately licensed and authorised water sources that would be finalised during detailed design of the project, with a preference to use existing concrete batching plants and their existing licensed and authorised water supply
- the water source for any new or temporary mobile concrete batching plants would be determined in consultation with local government, DRDMW, and landholders

- where possible, construction camps would be located near major towns to use existing services, including potable water supply and sewerage infrastructure, with the preferred hierarchy for water supply decisions to be:
  - access town water supplies from existing local government council water supply networks through construction of connecting water supply pipelines
  - access town water supplies and transport the water via truck to tanks stored on the construction camps
  - use of groundwater through existing licences and authorised groundwater reserves in consultation with local government council, DRDMW and landholders
- water would be recycled, where feasible, to reduce the total load of water requirements, though the EIS identified that the quantity would be subject to further discussions during detailed design.

The potential impacts on water supply are considered minimal following application of the above mitigation measures.

The proponent's commitment to prepare a Construction Water Plan is reinforced by recommendations in Appendix 2, Part B of this report. The recommendations state that mitigation measures identified in the Construction Water Plan should be implemented during construction of the project. The proponent's commitment to consult with DRDMW, local government and landholders is also reinforced by the recommendations in this report, and this consultation should also inform the Construction Water Plan.

5.3.4.4 Sewage and wastewater impacts

Sewage and other wastewater would be created primarily from construction camps, however trade waste may also need to be disposed of due to the operation of laydown/delivery areas. Where use of an existing local government council operated STP is not available, disposal of treated sewage is proposed to be via an irrigation scheme for construction camps.

5.3.4.4.1 Mitigation of sewage and wastewater impacts

To mitigate potential impacts from sewage and wastewater, the proponent has committed to design, construct, operate and decommission STPs in accordance with the manufacturer's specifications, legislative requirements and industry best practice.

The following measures are also proposed in the EIS to mitigate potential impacts from sewage and wastewater:

- the camps would be serviced by a STP adequate to meet the loading of each camp, comply with the relevant standards, guidelines and model operation conditions, and designed to incorporate regional considerations such as rainfall variability, depth to groundwater and buffer distances to watercourses and sensitive receptors
- where connection to a local government council operated STP is proposed, it would be assessed as part of the construction camp approval process through local government council or as part of a MID request
- where an STP is an environmentally relevant activity requiring an environmental authority under the EP Act and Environmental Protection Regulation 2019, the construction contractor(s) would be responsible for obtaining any STP approvals
- greywater and sewage at the substation sites would be managed in accordance with the Planning Act for sewage treatment that is not an environmentally relevant activity and greywater disposal or use.

Following application of the mitigation measures, the potential impacts related to water supply are considered minimal.

This report includes a recommendation (Appendix 2, Part B) to ensure the specific mitigation measures identified in the EIS are included as mitigation works and actions in the CEMP.

5.3.4.5 Operational impacts

As identified in the EIS, potential impacts to water resources are predicted to mostly occur during the construction phase of the project, and the commitments and specific measures to be implemented during construction are expected to address these impacts. The EIS identified that operations and maintenance activities that have the potential to impact on water resources would generally be limited to vegetation management, access track maintenance and life cycle replacement of project components. The EIS identified the following potential impacts to water resources due to operation and maintenance activities for the project:

- alteration of existing flood/stormwater behaviours, potentially impacting local or state controlled roads and railways or other adjoining properties and their buildings and infrastructure
- flood/stormwater damage to project infrastructure resulting in damage to surface water features (scour of bed and banks)
- effects on terrestrial and aquatic flora and fauna due to impacts on downstream or underling water quality
- surface/groundwater quality impacts if inappropriate management and disposal of substation sewage and greywater.

Mitigation measures proposed in the EIS to address the risk of these impacts are provided below.

5.3.4.5.1 Mitigation of operational impacts

To mitigate potential operational impacts from erosion and sedimentation on water resources, the proponent has committed to develop and implement an OEMP to provide specific environmental management requirements to minimise impacts from operational activities. In addition, proponent commitments and management measures implemented during construction are expected to reduce the potential for these operational impacts.

Following application of the mitigation measures within OEMP and mitigation and management measures during construction, the potential impacts related to operations and project maintenance activities are considered minimal.

The proponent's commitment to prepare and implement the OEMP is reinforced by recommendations in Appendix 2, Part B of this report. This report also includes additional recommendations (Appendix 2, Part B) to ensure the OEMP identifies and implements mitigation works and actions consistent with those implemented during construction to mitigate impacts from flooding and stormwater and impacts to water quality and surface or groundwater water users.

5.3.5 Coordinator-General's conclusion: water resources

Potential impacts to water resources are anticipated to predominantly occur during the project construction phase and comprise of impacts due to siting of infrastructure, and impacts from erosion and sedimentation, spills and contaminants, flooding and stormwater, construction water supply, and sewage and wastewater.

The proponent has committed to develop management plans, including an ESCP, Stormwater Drainage Management Plan and a Rehabilitation Plan, as well as a broader CEMP, implement mitigation works and actions, and undertake consultation with relevant State agencies, local government and landholders.

To support proponent commitments, this report includes recommendations (Appendix 2, Part B) for a MID that would require potential impacts to water quality during project construction to be mitigated and managed. The report also includes recommendations (Appendix 2, Part A) for detailed hydraulic modelling to be undertaken during the detailed design phase to confirm that project activities would not adversely impact on nearby infrastructure and adjoining properties.

Impacts to water resources during the project's operational phase are considered minimal following implementation of mitigation measures during the construction phase and operation phase. The proponent has committed to develop and implement an OEMP to mitigate and manage impacts during the project operational phase.

This report includes a recommendation for the OEMP to include measures to mitigate potential impacts from flooding and stormwater during operation, as well as any impacts to water quality values and other water users (Appendix 2, Part B).

Through the implementation of the proponent's commitments and the recommendations in this report, potential impacts on water resources have been considered, issues raised by submitters addressed, and appropriate management and mitigation measures recommended for subsequent considerations.

5.4 Transport

Chapter 13 of the EIS provides the proponent's assessment of project impacts on traffic and transport associated with the transportation of project components during the construction and operation of the project. This section evaluates these potential impacts and the proponent's proposed mitigations and management strategies.

5.4.1 Existing environment

An overview of the Regional Transport Network is provided in Figure 5.9.

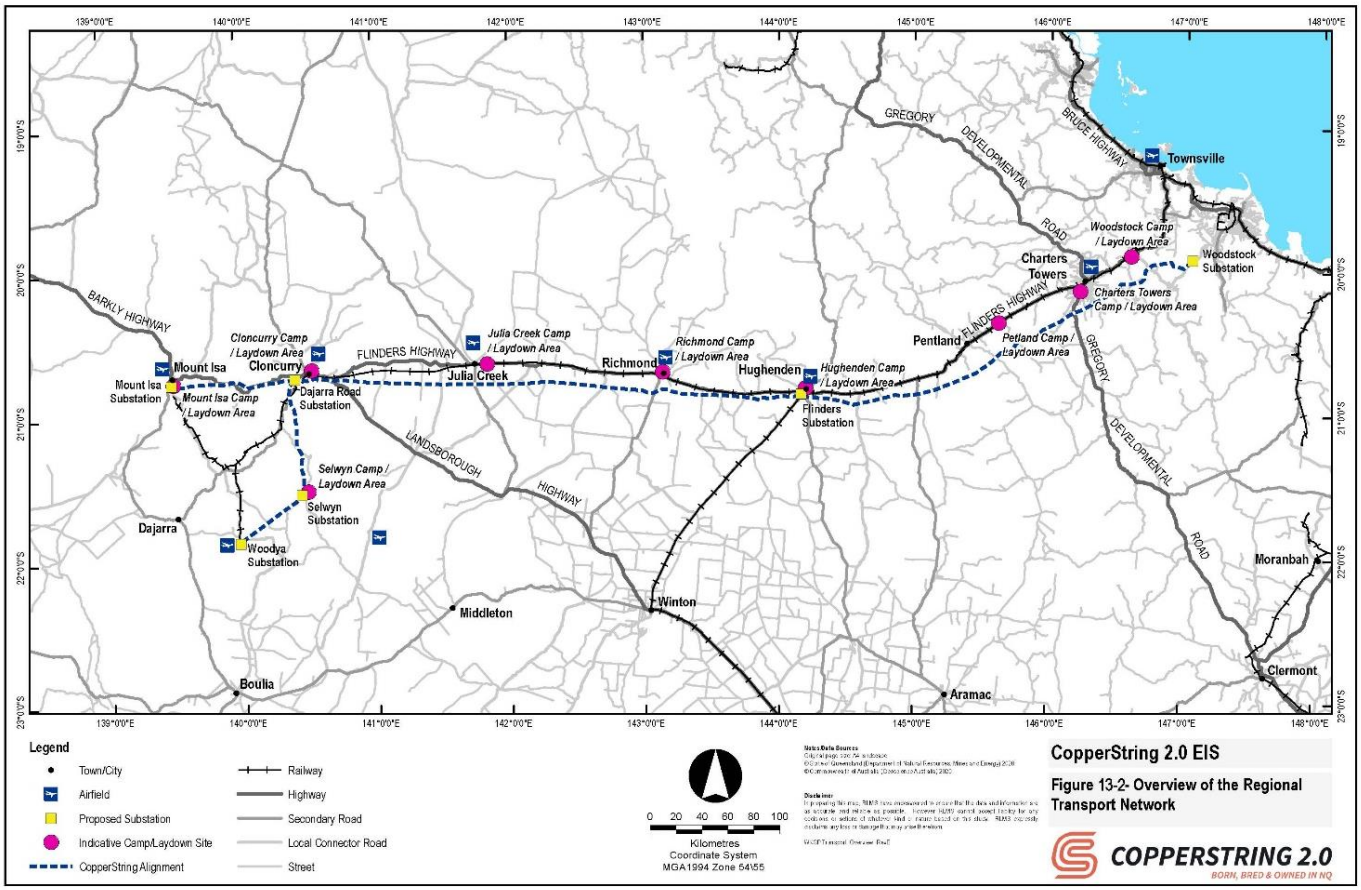

Figure 5.9 Overview of the regional transport network[34]

5.4.1.1 Road transport network

The major State Controlled Roads (SCRs) servicing the project area include the Flinders and Barkly Highways, both of which are managed by the DTMR. These roads run parallel to the project's Renewable Energy Hub, CopperString Core and Mount Isa Augmentation sections and are dual lane, sealed roads that meet interstate highway standards.

Access to the project corridor would also be provided through other SCR's including Townsville Port Road, Gregory Developmental Road and Landsborough Highway, local government roads and private roads. Access to the Southern Connection would be by a combination of gravel and single lane local sealed roads.

Access for Type 2 road trains (to 53.5 m long), identified in the EIS as the vehicle size likely to transport construction materials to laydown areas, is available from the Port of Townsville (POT) through to Mount Isa.

The EIS did not identify any height restrictions on the route between the POT and Mount Isa other than a rail bridge passing over the Flinders Highway at Charters Towers with 5.5 m clearance, conveyor infrastructure within the POT and Ergon Energy distribution assets within the POT.

The freight transport road corridor proposed for this project provides links with other corridors to facilitate the movement of freight through north west Queensland, including the Bruce and Barkly Highways and

[34] From the project EIS, Volume 2, Chapter 13. Updated version provided by proponent for this report.

the Burke, Wills and Kennedy Roads (see Figure 5.9 above Overview of the Regional Transport Network).

Many of the roads that have been identified as likely to be utilised to access the sites for construction are gravel roads owned and maintained by local government. They generally comprise of an 8 m wide formation and can accommodate some heavy vehicles, provided load limits are not exceeded. In practice, they are generally trafficable by road trains with 70 tonne capacity in the dry season.

5.4.1.2 Rail transport network

Queensland Rail operates the Mount Isa rail system, a single, narrow-gauge track which is the critical link from the NWMP to the POT extending across 1,032 km. Freight operators Pacific National, Aurizon and Linfox share the system, transporting minerals to the POT, with the 'Inlander' passenger rail service that runs two weekly return services between Mount Isa and Townsville and cattle trains.

5.4.1.3 Sea transport facilitates

As the nearest major seaport to the project area, it is expected that the bulk of the materials and equipment required for project construction would be transported through the POT. The POT services the north east and NWMP.

The POT's total tonnage during 2018/2019 was 7 million tonnes (comprising export commodities, including mineral concentrates, zine ferrites, refined copper, smelted lead, sugar and cattle) and 56,575 total container movements.

5.4.1.4 Air transport facilities

Airlines including Virgin Australia and Qantas service Mount Isa, Cloncurry and Townsville from Brisbane daily. Qantas also operates daily services between Townsville, Cloncurry and Mount Isa. A range of general aviation charter operators are available for fly-in operations including Cloncurry, Hughenden, Phosphate Hill (Monument Airport) and Richmond.

Townsville hosts a small range of helicopter charter services, including at least one company with a line stringing capability.

5.4.2 Submissions

The key issues regarding transport impacts raised in submissions on the EIS include the following:

- the need for a complete Traffic Impact Assessment (TIA) prepared in accordance with DTMR's Guide to Traffic Impact Assessment (GTIA)[35] detailing the full extent of the project's impacts on the State transport network and railway level crossings
- the potential for impacts on the road network from project construction traffic, especially oversized loads, and associated resourcing implications for permits and police escorts to ensure safety
- the need to define final locations for transmission towers and construction facilities in proximity to local roads, SCRs and railway corridors to be able to properly assess site-specific impacts and identify management measures
- the need for further flood analysis to detail how the project could influence stormwater and flooding regimes and the impact this may have on the railway corridor

[35] https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Guide-to-Traffic-Impact-Assessment.

- ongoing consultation with relevant stakeholders (including local government) was requested during the preparation of Road Use Management Plans (RUMPs).

This report has considered each submission received and the responses provided by the proponent in the evaluation of the project. Assessment of key matters is provided below.

5.4.3 Methodology

The study area for the project includes all the major SCRs, local government roads and private roads that may be required to access the project corridor, including all intersections and rail crossings. Air and sea networks that may be utilised for the transportation of materials, equipment and workforce were also included in the assessment undertaken by the proponent in the EIS. The EIS included a TIA which identified the existing transport networks that may be used to access the project corridor and outlined the potential impacts to all transport networks and associated mitigation measures.

The TIA was based on a desktop analysis and a field inspection that was undertaken during February and March 2020. The requirement for a further traffic impact assessment process in line with DTMR's GTIA remains.

5.4.4 Impacts and mitigation

5.4.4.1 Transport impacts during construction

The EIS states that due to the structure of the project, point to point service via road is considered more efficient and cost effective than line (rail) haul transport. For this reason, transporting project materials by road is the preferred modal choice for the project.

An increased amount of traffic is expected to be generated during the construction of the project and would predominantly comprise of construction vehicles delivering materials to construction sites as well as daily workforce movements between camps and construction sites using SCRs, local government roads and private roads.

The EIS states that the proponent proposes to minimise impacts to the transport network by locating construction facilities close to the project corridor. Locating construction camps and construction facilities (laydown/delivery areas and concrete batching plants) close to the project corridor would reduce the number of local transport movements.

Transmission line construction materials, such as the tower steel, conductors, fixtures and foundation reinforcement would be transported from the POT to a logistics yard outside of Townsville. The materials would then be distributed to laydown/delivery areas located within each of the nine construction hubs. Steel would be unloaded and preassembled at each laydown/delivery area, before being transported in suitably sized vehicles to transmission tower locations.

Materials and plant including fuel would also be transported from Townsville to the construction facilities. Concrete and aggregate for tower footings would need to be sourced from existing or mobile batching plants located adjacent to the tower sites for each construction hub.

Numerous over dimensional loads required during the construction of the project, including substation components, would involve movements from the POT to each laydown/delivery area. Larger loads may require heavy vehicle escort and associated approvals from the DTMR and the QPS.

The establishment of construction camps would involve transportation of camp construction materials and demountable units from Townsville.

Workforce movements would include deployment of workers to each camp by air or bus services as well as daily movements between camps and construction facilities. The transportation of the workforce to and from construction camps would require a combination of fly-in fly-out (FIFO) and bus-in bus-out (BIBO) deployment of workforce, with Townsville as the FIFO/BIBO hub servicing construction camps utilising chartered flights. The daily movement of workers would be localised within each construction hub to reduce cumulative movements along the major SCRs. Daily worker movements would comprise predominantly of four wheel drive vehicles and buses, seeing peaks of traffic generation in early mornings and late afternoons.

The estimated traffic generated for each construction hub is outlined in Table 5.8 below and is based on outbound (one way) movements only.

Table 5.8 Estimated vehicle movements for construction hub

Construction Zone	Heavy vehicles				Total heavy movements	Light vehicle movement	Total movements
	Type 2 Road Train	Semi-trailer	Concrete truck	Bus			
Woodstock	380	4,142	1,376	260	6,158	4,564	10,722
Charters Towers	592	575	2,015	364	3,546	2,384	5,930
Pentland	1,060	950	3,872	468	6,350	10,380	16,730
Hughenden	1,331	2,820	5,979	1,196	11,326	18,958	30,284
Richmond	1,533	710	7,722	312	10,277	7,494	17,771
Julia Creek	1,583	1,008	8,455	364	11,410	7,820	19,230
Cloncurry	2,125	3,181	8,805	1,820	15,931	31,606	47,537
Mount Isa	567	2,330	2,056	676	5,629	4,712	10,341
Selwyn	756	2,846	1,505	0	5,107	2,688	7,795
Cannington	15	1,560	120	0	1,695	0	1,695
Phosphate Hill	15	1,560	120	0	1,695	0	1,695

5.4.4.1.1 Road impacts

The primary potential impacts from project traffic and road use are associated with the increased volumes of heavy and light vehicles using SCRs and local government roads which may impact the safety and function of these roads. Impacts include an increased potential for accidents and accelerated pavement degradation.

The EIS reports that the heavy vehicle delivery of machinery, equipment, material and light vehicle transportation of workforce personnel are predicted to generate the following impacts:

- increased traffic volumes on SCR and local roads
- potential disruptions to local communities from increased traffic volumes
- increased accident risk during railway track crossing works or when turning at intersections
- delays to existing traffic flows during construction of crossings, or in close proximity to, existing rail lines and roads

- increased accident risk with other road users especially tourist (unfamiliar) and school buses (often stopping, unaccompanied children)
- accelerated degradation of pavement surfaces, increasing risks to all road users and increasing maintenance requirements for the state and local governments
- over dimensional loads requiring heavy vehicle permits and pilots to provide safe delivery of large plant.

The proponent undertook a review of the existing condition of potential access roads and major intersections that may be used during the construction of the project to determine whether the intersections were suitable for use or whether upgrades were required. The proponent has prepared a list of the intersections along SCRs that would require additional works to be made suitable for use during project construction, as per the requirements of the DTMR's GTIA, see Table 5.9 below.

Table 5.9 SCR additional intersection works

DTMR Road ID	Location	Further investigation required	Improvements required	Total
14A	Flinders Highway	0	1	1
14B	Flinders Highway	1	6	6
14C	Flinders Highway	2	3	4
14D	Flinders Highway	1	6	7
14E	Flinders Highway	1	2	3
15A	Barkly Highway	10	1	11
5407	Burdekin Falls Dam Road	1	1	1
98B	Gregory Developmental Road	1	0	1
5703	Torrens Creek Aramac Road	0	0	0
5701	Hughenden Muttaburra Road	0	0	0
99C	Kennedy Developmental Road	1	2	3
5803	Richmond Winton Road	0	1	1
5807	Julia Creek Kynuna Road	0	0	0
89A	Burke Developmental Road	0	0	0
13H	Landsborough Highway	1	1	1
7708	Cloncurry Dajarra Road	4	2	4
7709	Mount Isa Duchess Road	0	0	0
93E	Diamantina Developmental Road	0	1	1
93F	Diamantina Developmental Road	0	0	0

Mitigation of road impacts

The proponent has committed to undertake a detailed TIA in accordance with the DTMR's GTIA that would be submitted as part of a MID application. The proponent would be required to undertake additional investigations, including a road safety audit, as part of preparing a TIA. The TIA would need to further detail the impacts predicted to the safety, efficiency and condition of SCRs and the local road network as a result of construction and operational activities and include appropriate mitigation strategies. The TIA would need to be sufficiently detailed to demonstrate the rationale for all the works

identified in a MID application. This commitment is reinforced by the recommendation in Appendix 2, Part A that a TIA, detailing project impacts and mitigation strategies and prepared in accordance with the GTIA, be submitted as part of a MID application.

Agencies (including DTMR) may identify additional requirements or recommendations as further information is provided in the updated TIA, which would be resolved during future assessment processes.

In addition, the proponent has committed to developing and implementing the following plans to ensure safety on SCRs and local roads during construction:

- a RUMP to address the increased traffic on state and local roads during construction; to include, but is not limited to, details about movements of heavy vehicles, school zone impacts including school bus routes, impacts to access to state-owned forest products/commercial timber/quarry material, transport of construction workers, and details regarding access to transmission line easements
- a Traffic Management Plan (TMP) identifying roads that would be impacted for each construction hub, and traffic management works required to be undertaken to manage impacts.

The following measures are proposed in the EIS to be incorporated within the RUMP and TMP:

- using a combination of FIFO and BIBO workforce travel, with the construction workforce primarily residing in workers camps
- placement of access tracks to distribute on-road vehicle movements over multiple roads
- construction contractor/s to develop and implement traffic management and road use plans, specific to phase and work fronts
- improving/implementing advanced warning and visibility of intersections through approach signage, reduced speed zones or chevrons
- widening of intersections, where determined necessary in updated TIA (additional investigations and a road safety audit shall be undertaken to determine the extent of widening works warranted for safe turning)
- safety inductions of all construction contractor personnel, with all personnel required to use personal protective equipment including high visibility vest and use of warning signs
- project vehicles would be equipped with UHF radios to enable communications between heavy vehicles operating in proximity
- project vehicle movements would be scheduled to avoid existing larger volume and heavy vehicle movement periods including school bus peak times
- rehabilitation of road pavements at the completion of construction.

The proponent has committed to consult with DTMR, Queensland Rail, the Department of Education, and local government in the development of the RUMP and TMP. The proponent has also committed to carry out any mitigation works and actions as identified in the TMP during the construction and operations phases of the project.

The proponent's commitment to prepare a TIA, RUMP and TMP for construction and operational traffic impacts and to implement the mitigation works and actions identified is reinforced by recommendation(s) in Appendix 2, Part A and Part B. These recommendations also reinforce the proponent's commitment to consult with DTMR, Queensland Rail, the Department of Education, local government and other agencies including the QPS, the QAS and the Queensland Fire and Emergency Services (QFES) to inform the development of the TIA, RUMP and TMP. I am satisfied that through the implementation of

the proponent's commitments and the recommendations in this report, potential road impacts would be appropriately identified and managed and issues raised by submitters addressed.

5.4.4.1.2 Rail network impacts

The EIS states that there are no impacts predicted on the capacity of the rail network as all material and equipment would be delivered to construction hubs via road. The EIS does identify that level railway crossings would be traversed by the projects' heavy and light vehicles. At-level railway crossings with short storage lengths (length of road occupied by queuing traffic) may be impacted if multiple heavy vehicles are required to queue, potentially impacting intersecting roads and causing delays to traffic.

The at-level railway crossings within the road network likely to be traversed by construction traffic were investigated by the proponent to determine storage lengths of concern for local government road intersections with rail crossings proximate to a SCR. Table 5.10 below lists those local government road intersections proximate to a SCR where storage length may be of concern.

Table 5.10 Storage lengths for local government road intersections

Rail ID	Storage road	Intersecting road	Approximate storage length
LG Rail 02	Braceborough Road	Flinders Highway 14B	30
LG Rail 03	Red Road	Flinders Highway 14B	30
LG Rail 04	Laidlow Crossing	Flinders Highway 14B	35
LG Rail 07	Road	Flinders Highway 14B	35
LG Rail 08	Cotonvale Penrice Road	Flinders Highway 14B	85
LG Rail 09	Prairie Muttaburra Road	Flinders Highway 14B	30
LG Rail 10	Kennedy Energy Park Access Track	Flinders Highway 14B	70
LG Rail 11	Thornhill Tamworth Road	Flinders Highway 14C	35
LG Rail 14	Road	Flinders Highway 14C	30
LG Rail 22	Duchess Chatsworth Road	Duchess Phosphate Hill Road	70

Mitigation of rail network impacts

The proponent has committed to develop a TMP in consultation with relevant transport authorities including DTMR, Queensland Rail and local government, which would include a detailed rail impact assessment outlining the volumes and frequency of traffic expected to traverse level rail crossings.

The rail impact assessment would detail peak traffic volumes, such as daily workforce movements in addition to heavy, over dimensional vehicles that would cross rail structures including level crossings. It would also be informed by an assessment of queuing distance in order to demonstrate sufficient clearance between each level crossing and adjacent intersections, to allow the longest vehicles used to transport construction materials to queue.

DTMR has requested that the rail impact assessment be prepared as part of the updated TIA. Accordingly, this report includes a recommendation in Appendix 2, Part A that a TIA be prepared, that includes a detailed rail impact assessment with mitigation works and actions identified and implemented through the project's construction phase. It is recommended that the TIA is lodged as part of the MID application.

The proponent has also committed to consult with the owners of any infrastructure, including Queensland Rail, that the project may cross during detailed design and to plan for any necessary outages during construction.

This commitment is reinforced by a recommendation in Appendix 2, Part B that the proponent consult with infrastructure owners prior to construction of the project.

The EIS states that in addition to the TMP, Australian Level Crossing Assessment Model (ALCAM) assessments are proposed, which would identify any upgrades required for railway level crossings impacted by project construction, in accordance with Queensland Rail's Guide to Development in a Transport Environment. This report includes a recommendation, in Appendix 2, Part B of this report, for ALCAM assessments to be undertaken of impacted railway level crossings, informed by proposed construction routes, traffic volumes and vehicle details.

This report also includes additional recommendations Appendix 2, Part B to ensure project activities do not adversely impact on the safety and efficiency of railways (railway corridor, rail infrastructure and level crossings) as part of the subsequent MID process. These recommendations seek to address agency concerns including potential impacts on the railway corridor resulting from project related changes to stormwater and flooding regimes.

5.4.4.1.3 Air service impacts

Charter air services would be used to operate the FIFO operations for the project. Townsville would be used as the FIFO hub and regular flights would be operated to service the camps at Hughenden, Richmond, Julia Creek, Cloncurry, Mount Isa and Selwyn.

The main impact to air services is an increased use of air services for FIFO workers due to additional workforce travelling to construction hubs. The EIS states that Alliance Airlines currently operates a regional charter service and passenger services operated by Qantas, Virgin Australia and REX Regional Express, also have capacity to meet additional travel demands.

The EIS concludes that the proposed workforce movements are expected to be adequately catered for by airlines that currently operate within the region.

Mitigation of air service impacts

To mitigate potential impacts on air services as a result of additional workforce travelling to work fronts during the construction phase, the proponent proposes to undertake an assessment of flight schedules and cost prior to construction commencing as well as use a combination of FIFO and BIBO workforce travel.

5.4.4.1.4 Sea transport impacts

The key predicted impact to sea transport is the increased container movement at the POT as the majority of project equipment and materials would be imported through the POT via shipping containers, before being transported via road to the respective construction hubs.

The EIS anticipates that this would have a negligible impact on the POT due to ongoing expansion works aimed to increase the capacity of importing and exporting goods. In addition, the regular scheduled shipping lines are expected to allow sufficient capacity for the estimated material volumes incurred for the project duration.

Mitigation of sea transport impacts

The EIS states that the proponent would liaise with the POT regarding berth availability and height restrictions during the pre-construction phase, to ensure any potential impacts on sea transport and the

POT are mitigated. This report includes a recommendation (see Appendix 2, Part A) that the proponent consult with the POT regarding berth availability and height restrictions during the pre-construction phase prior to lodgement of a MID application.

5.4.4.2 Transport impacts during operation

The EIS states that traffic movements generated during the operational phase would be minimal, comprising primarily of service vehicles undertaking general maintenance and inspections. The low traffic volumes are anticipated to result in negligible impact to road, rail network, air service and sea transport infrastructure.

The EIS states that in the event large scale refurbishments are required, such as replacement of substation components, it would likely require oversized vehicles similar to those used during the construction phase. The transport infrastructure established or upgraded during the construction phase should remain sufficient. I have included a recommendation in this report (Appendix 2, Part B) that engagement with relevant stakeholders be undertaken prior to the beginning of any upgrades or refurbishment works.

5.4.5 Coordinator-General's conclusion: transport

Construction traffic impacts for the project would comprise of heavy vehicles for the haulage of materials and light vehicles for the transportation of the workforce. As such, impacts to road capacity, pavements and intersections are predicted to occur. The impacts associated with road transport for construction can be mitigated and managed by effective planning and development of a TIA, TMP and RUMP.

Impacts on air service and sea transport are anticipated to be minimal as there is existing sufficient capacity to support the additional import loads and workforce transport.

A rail impact assessment will be undertaken outlining the volume and frequency of traffic expected to traverse level rail crossings and will identify requirements for rail crossing upgrades.

Impacts to traffic during the project's operational phase are predicted to be minimal comprising primarily of service vehicles undertaking general maintenance and inspections.

The proponent has committed to submit a TIA in accordance with DTMR's GTIA with a MID application. The TIA would include detailed information on the design of road crossings and rail crossings in accordance with DTMR requirements. The proponent has also committed to develop a RUMP and a TMP which would include consultation with the relevant transport authorities (including DTMR, Queensland Rail, the Department of Education, local government, and other agencies as necessary).

In line with the proponent's commitments and agency advice, this report includes recommendations that a TIA be developed in accordance with DTMR's GTIA for the project and submitted as part of the MID application and that the TIA include a detailed assessment of the project's impact on all railway level crossings impacted by the project's construction and operational traffic. This report also includes recommendations that the TIA, RUMP and TMP be prepared in consultation with the relevant transport authorities.

Finally, this report recommends that the proponent undertake any mitigation works and actions as identified in the final TIA as part of the subsequent MID process and into construction.

I am satisfied that through the implementation of the proponent's commitments and the recommendations in this report, potential impacts on traffic and transport would be appropriately identified and managed and issues raised by submitters addressed.

5.5 Economics

Section 16 of the EIS provides the proponent's assessment of economic impacts from the project, particularly impacts on the price of electricity in the North West Queensland region; on the Queensland part of the NEM; and on the local, regional and state economies. This section evaluates the project's potential economic benefits and opportunities.

5.5.1 Existing environment

The major industries in the North West Queensland region are agriculture, particularly production of beef cattle, and mining, predominantly within the NWMP. Electricity is supplied via the NWPS, an isolated grid with central generation in Mount Isa.

5.5.1.1 North West Minerals Province

The NWMP is one of the world's richest producing mineral regions and is emerging as an exploration area for new economy minerals and metals, such as vanadium, that are critical to the production of renewable energy technologies such as solar panels, wind turbines and large scale batteries.

Over the past 20 years, 80% of Queensland's base metals export has been extracted from mines in the NWMP predominately from:

- the Mount Isa mine complex - copper/zinc/lead (Glencore)
- Century mine (mining ceased in early 2016) - zinc/lead (MMG)
- Cannington mine - zinc/lead (South32).

Export levels have also been supported by several smaller to medium sized mines targeting common base metals and precious metals, such as copper, gold and silver.

The NWMP contains around 75% of Queensland's base metal mineral reserves, including copper, lead, silver and zinc, as well as phosphate deposits. The increased demand for these resources has increased commodity prices and resulted in a corresponding increase in exploration activity and expenditure in the NWMP. While mineral and metal reserves are forecast to remain in demand by global manufacturing and construction industries, there remains key challenges to the future extraction of these resources.

The EIS states development of the NWMP is affected by several factors, including recent closure of mines and potential future closures, rising input costs, exploration activity, new mine investments and market demand. The EIS states a significant challenge faced by the NWMP over the past few years has been the closure of several mines due to exhaustion of reserves or projects being placed in care and maintenance. This trend is anticipated to continue for the next 10 to 15 years with other mines anticipated to reach the end of their economic life.

Notwithstanding closure of traditional mines in the NWMP, there is potential for future growth due to technological advancements in the re-processing of existing mine tailings and exploration and extraction of minerals which have not traditionally been mined or explored in the province including vanadium, graphite and cobalt. For instance, in the NWMP, New Century Resources commenced re-processing tailings at the Century Mine in 2018 and Multicom Resources is finalising approvals for its Saint Elmo Vanadium Mine.

The EIS also states rising input costs over the past decade, particularly electricity, has impacted the competitiveness of Queensland mines when compared to their competitors in other jurisdictions. The NWMP is predominately powered by gas. Gas prices have increased significantly in recent years and there remains uncertainty regarding supply adequacy in eastern Australia over the medium to long-term.

Electricity costs are a sizeable share of a mine's operating costs, and the EIS states options that lower electricity prices, as proposed by the project, may increase the competitiveness of Queensland mines.

The Queensland Government supports development of the NWMP to ensure mining in the province is sustainable over the long term to meet growing global demand for minerals and metals. The Queensland Government is working in partnership with North West Queensland communities, councils and industry to encourage new exploration, reinvestigation of old mines, and evaluation of the effectiveness of existing geological information held by the Queensland Government.

5.5.1.2 Existing electricity supply

The EIS states the existing demand for electricity in the North West Queensland region is approximately 396 megawatts (MW). Electricity supply is dominated by gas-fired generation with some liquid fuel generation and new solar development.

Electricity in the NWPS is predominantly supplied by the Diamantina Power Station, which commenced operations in 2014. Prior to the operation of the Diamantina Power Station, the Mica Creek Power Station was the main source of supply. The Mica Creek Power Station ceased operating in 2020 as it was unable to secure contracts for 2021 and beyond. In June 2022, Glencore became the owner of the Mica Creek Power Station to rehabilitate the site, and subject to approvals and conditions being met, Glencore may re-commence operations in the future. This EIS was not informed by changes to the ownership of the Mica Creek Power Station.

As an isolated grid reliant on gas-fired power, mining and industrial operations connected to the NWPS are exposed to a greater extent to higher priced gas than those connected to the NEM. This is primarily due to the large increase in gas prices in recent years. The spot gas price for large industrial consumers in Mount Isa rose from approximately $5 per gigajoule (/GJ) in 2013 to $10-12/GJ (current at time of EIS), to $40-50/GJ in mid-2022, driven by international market volatility. Higher wholesale electricity prices have increased electricity operating costs for mines in the NWMP and more broadly across the NEM. The EIS states that prices are anticipated to increase over time, which would increase electricity prices.

In quarter two of 2022, wholesale spot gas prices rose to unprecedented levels across the east coast market (Queensland, New South Wales, Victoria and South Australia).[36] The Australian Energy Market Operator, which is responsible for operating the NEM, predicts that gas prices will surge over 2022-2024 across a range of market scenarios due to high global demand and maturing supply in southern jurisdictions.[37]

5.5.1.3 Northern Queensland Renewable Energy Zone

The project corridor would pass through the Northern QREZ which stretches between Mackay and Cairns, encompassing the northern most extent of Powerlink's existing transmission network. The project is expected to enable the connection of future renewable energy projects to the NEM.

The Queensland Government is supporting development of the Northern QREZ to unlock up to 500 MW of renewable energy potential in Far North Queensland, which has some of the strongest wind and solar resources in Australia. The first project being constructed in the Northern QREZ is the Kaban Green

[36] Australian Energy Market Operator, *Quarterly Energy Dynamics Q2 2022*, July 2022, available at: **https://www.aemo.com.au/-/media/files/major-publications/qed/2022/qed-q2-2022.pdf?la=en**

[37] Lewis Grey Advisory, *Gas Price Projects for Eastern Australia Gas Market 2022*, prepared for Australian Energy Market Operator, 9 December 2021, available at: **https://aemo.com.au/-/media/files/major-publications/isp/2022/iasr/lewis-grey-advisory-gas-price-projections-report.pdf?la=en**.

Power Hub, a 157 MW windfarm and 100 MW battery proposed by Neoen Australia. Construction of the project commenced in 2021 and the windfarm is expected to be operational in 2023.

The North West Queensland region also has significant potential to supply geothermal, biomass and non-traditional (tight shale) resources, which may be connected to the NEM.

5.5.2 Submissions

The key issues regarding economic impacts raised in submissions on the EIS included concerns with the adequacy of the economic modelling methodologies used for the economic impact assessment of the project, including issues related to the input assumptions, projected benefits, anticipated costs and impacts, and regulatory arrangements.

This report has considered each submission received and the responses provided by the proponent in evaluation of the project. Assessment of the key matters is provided below.

5.5.3 Methodology

The economic impact assessment was undertaken in accordance with the Coordinator-General's *Economic Impact Assessment Guideline* and included a regional impact analysis and a cost-benefit analysis (CBA) of the project. The economic impact assessment considered research and analysis of anticipated population growth, planned and potential major projects, and other key drivers to develop an economic baseline.

The regional impact analysis in the economic impact assessment used a computable general equilibrium (CGE) modelling approach to identify the predicted spending on goods, services, taxes etc, during the construction and operation of the project and the distribution of income generated by the project. CGE modelling is a widely used tool for providing rigorous estimates of whole economy outputs by using actual economic data to estimate how an economy might react to changes in policy, technology, or other external factors. Accordingly, CGE modelling may be appropriate where a project is strongly influenced by external factors or policy decisions of government.[38]

The CBA approach was used in the economic impact assessment to evaluate the overall benefits and costs of a project. The anticipated future flows of costs and benefits of the project were discounted to arrive at a present value. This takes into account the fact that projects may be constructed and operated over long timeframes and the value of costs and benefits depends on when they actually occur. By adding together all present values of the future flows of costs and benefits, it calculates a project's net present value. If the net present value is positive, it concludes the project has economic merit.

The methodology used to undertake the project's economic impact assessment is considered adequate and addresses the project's terms of reference to present both a regional impact analysis and a CBA.[39] I acknowledge that there are limitations of the methodology and assumptions presented in the EIS for predicting job figures and economic benefits, however, the EIS has provided sufficient information to indicate the project's general economic impacts, both positive and negative, to Queensland, the North West Queensland region, and for local employment and the supply chain.

I note the proponent is working with the Queensland Government, separate to the EIS, to finalise arrangements about how the project could be delivered.

[38] The Department of State Development, *Economic Impact Assessment Guideline,* April 2017, Coordinator-General.
[39] Clause 12.81, CopperString Project terms of reference for an environmental impact statement.

5.5.4 Impacts

The economic impact assessment estimated the potential positive and negative economic impacts, both direct and indirect, to the regional, state and national economies during the construction and operation phases of the project. The value of impacts depends on fluctuations of global economic factors such as price of electricity, exchange rates and commodity prices.

I note the Queensland Government undertook public consultation to identify options to deliver affordable, secure, reliable, and sustainable electricity supply in the NWMP and to provide a connection through the Northern QREZ, through to Hughenden. This process, known as a regulatory impact statement, was undertaken as part of assessing proposed legislative derogations for this project. The Queensland Government released a Consultation Regulatory Impact Statement for public consultation in December 2021 seeking stakeholder feedback on options to supply electricity in the NWMP. The 3 options identified, which includes the project, is discussed further in section 2.3.1 of this report. The Queensland Government is reviewing responses received during public consultation.

5.5.4.1 Direct economic benefits

During construction of the project, direct benefits would be provided through investment expenditure, which would have flow-on effects to domestic business activity and employment. The CBA undertaken found the project is estimated to have a capital expenditure of approximately $1.75 billion.

The EIS states that the project would create up to 750 FTE jobs during the construction phase and up to 30 FTE jobs to operate and maintain infrastructure. The workforce required for the project would comprise predominantly of civil workers, steel construction workers, aerial crew and fibre jointers. The construction and operational workforce profile for the project, including potential social impacts and mitigation measures, are discussed further in section 5.6 of this report.

To support employment opportunities from the project, the proponent has committed to develop and implement a local business participation strategy and a strategy for Indigenous participation. These strategies would give preference to local, regional and Indigenous-owned businesses when evaluating tender offers; would detail measures for local and Indigenous participation and employment, and include details for employment of apprentices and trainees. The commitment to prepare these strategies is reinfored by a recommendation in Appendix 4 of this report.

During operation of the project, direct benefits would be provided through ongoing periodic expenditures over the life of the project as components need to be replaced, as well as through operation and maintenance expenditure.

5.5.4.2 Electricity market impacts

In order to understand the current situation and potential impacts of the project on the electricity market, the CGE and CBA modelling presented in the economic impact assessment compared two scenarios: a business-as-usual case without the project (gas-fired generation), and the project, connecting the North West Queensland region to the NEM. The assumptions used in the assessment of the electricity market for the project are outlined in Section 5 of Volume 3, Appendix AB of the EIS.

The economic impact assessment estimates a 70% increase in demand for electricity over the period to 2050 from several significant potential mining projects and expansion projects including, but not limited to, the Mount Isa mine complex (Glencore) and Phosphate Hill (Incitec Pivot). The economic impact statement states that expressions of interest to connect to the project are ongoing and negotiations with Glencore, MMG, Incitec Pivot, New Century Resources and Chinova Resources are advancing. It is acknowledged there is uncertainty whether potential projects will progress and/or whether the proponent would secure contracts to supply electricity to these customers, and this would impact on the projected

demand for the project. Potential customers for the project are discussed further in section 2.2.1 of this report.

The economic impact statement states the project would reduce wholesale electricity prices in the Mount Isa region to 2050. It is acknowledged that the project's proposed reduction of electricity prices in the North West Queensland region is dependent on demand in the region and final construction cost.

The EIS states potential indirect benefits of the project on the electricity market may include:

- improving productivity of the Queensland electricity generation sector by connecting two electricity grids would lead to efficiency gains, lower maintenance costs, access to cheaper alternative electricity sources (e.g. solar and wind), and would create value for North West Queensland customers by reducing electricity prices
- decreasing input costs to the mining industry from lower electricity prices, which is discussed in section 5.5.4.3 below.

Notwithstanding the potential benefits, the EIS identified costs associated with the project. The EIS found the project would potentially increase the annual cost of network use of systems charges for all business and residential electricity customers in Queensland. The EIS noted an annual increase of between $2.75 to $6.42 for Energex customers and between $2.07 to $6.24 for Ergon customers.

5.5.4.3 Mining industry impacts

The EIS states that while the mining industry in the NWMP is mature, the cost to establish and operate in the province is relatively expensive due in part to the very high cost and limited options for electricity supply. The EIS states that access to the NEM via this project could provide mining industries with more reliable, flexible and competitive electricity, that would result in lower electricity costs and could lead to increased mineral resource production by reducing a large input cost. This reduced electricity price could support mining project viability leading to the establishment of new mines, returning mines to production or prolonging existing mining operations in the NWMP.

The CGE and CBA modelling presented in the EIS modelled a reduction in electricity prices with a predetermined outcome of increased mineral production. While I acknowledge that any reduction in electricity prices would be beneficial to mines and potential mining projects, the most significant factors affecting the overall viability of mines and mining projects are commodity prices, exchange rates and the relative globe cost advantage/disadvantage.

The EIS identifies that should the project stimulate investment in the NWMP, this growth would provide the Queensland Government with additional royalties, the Australian Government with additional company tax and provide consumer surplus due to lower electricity prices.[40]

The EIS states that by reducing the electricity costs for mines in the NWMP, the project could:

- support the production, processing and export of previously uneconomic mineral resources in the province
- reduce cut-off grades, which would allow more ore to be extracted, increase mine production, and extend mine life
- support the development of deeper deposits and new deposits (e.g. new economy minerals), including medium sized developments that would not be feasible under a business-as-usual case

[40] Consumer surplus occurs when the price that consumers pay is less than the price they are willing to pay.

- support the expansion or establishment of businesses in the North West Queensland region due to increased mining activity.

5.5.4.4 Renewable energy generation

The proponent estimates the project may connect some of Queensland's highest quality renewable energy resource regions to the NEM, which are currently sterilised by the lack of connection to the NEM.

By providing connection between the Northern QREZ and the NEM, the project could unlock up to 500 MW of wind and solar and reduce reliance on gas-fired generation to supply residences and businesses in the North West Queensland region. If renewable energy sources were developed, this could also potentially reduce greenhouse gas emissions from electricity generation. Potential project impacts on air quality and greenhouse gas emissions are discussed further in section 5.8.2 of this report.

5.5.4.5 Real economic output and real income impacts

As a result of the construction and operation of the project, the EIS predicts the real economic output of and real income in the North West Queensland region and Queensland more broadly to increase. The real economic output is the total value of goods produced and services provided in Australia, Queensland and the North West Queensland region directly or indirectly attributed to the project. This is also referred to as gross domestic, state or regional product. Real income is the income of individuals or Australia after adjusting for inflation directly or indirectly attributed to the project.

The construction phase of the project is expected to directly support an increase in economic output and real income of residents located along the project corridor due to increased demand for labour, goods and services for the project. The operation of the project could have an indirect impact on real economic output and real income of residents in the North West Queensland region by stimulating investment in the NWMP and the Northern QREZ. Real income from increased mineral production is shared across Queensland and Australian residents through the payment of taxes and royalties by mining companies and by the payment of dividends to shareholders of resource companies.

5.5.5 Government funding

There has been project development support provided by Queensland and Australian Governments and the project's request for funding from the Northern Australia Infrastructure Fund has progressed to the due diligence phase of assessment. Government funding is discussed in section 2.3.1 of this report.

5.5.6 Coordinator-General's conclusion: economics

The EIS identifies the potential economic impacts and benefits associated with the project. The economic impact assessment was prepared generally in accordance with the Coordinator-General's *Economic Impact Assessment Guideline* and the methodology used to undertake the project's economic impact assessment for the project is considered adequate and addresses the project's terms of reference to present both a regional impact analysis and CBA.

The EIS concluded that by connecting the North West Queensland region to the NEM, where price and standards of service are governed at the national level, the project would provide economic benefits to the North West Queensland through a reduction in electricity prices. However, the EIS found these benefits would come at the expense of all business and residential electricity customers in Queensland. I note the proponent is working with the Queensland Government, separate to the EIS, to finalise arrangements about how the project could be delivered.

In addition, the EIS demonstrated the project would provide economic benefits to the North West Queensland region by employing up to 750 FTE jobs during construction and up to 30 FTE jobs during

operation; and increasing the real economic output and real income for the region during construction and operation phases from the supply of goods and services and employment of residents. Should the project stimulate investment in the NWMP and the Northern QREZ, the project could provide opportunities to also increase mineral production in the NWMP and increase the broader real economic output and real income for the North West Queensland region, Queensland and Australia.

The proponent has committed to develop and implement a workforce management plan and a local and Indigenous business participation plan. These strategies would give preference to local, regional and Indigenous-owned businesses when evaluating tender offers; would detail measures for local and Indigenous participation and employment, and include details for employment of apprentices and trainees. The commitment to prepare these plans is reinfored by an imposed condition in Appendix 1 of this report.

Through implementation of the proponent's commitments, potential economic impacts would be appropriately identified and managed, and would address issues raised by submitters.

5.6 Social

Appendix Z of the EIS included a social impact assessment (SIA), consistent with the Coordinator-General's SIA Guideline (March 2018) (SIA Guideline).[41] This section evaluates the proponent's SIA, including potential mitigation and management strategies.

The SIA for the project considered potential social impacts in the context of the following areas of influence:

- local study area – is the project area
- regional study area – including the LGAs of:
  - Burdekin Shire Council
  - Charters Towers Regional Council
  - Flinders Shire Council
  - Richmond Shire Council
  - McKinlay Shire Council
  - Cloncurry Shire Council
  - Mount Isa City Council.

The proponent prepared a social baseline for the project consistent with the requirements of the SIA Guideline. Key findings from this baseline include:

- the local study area does not include any land zoned residential or dwellings located on agricultural property
- the SIA regional study area captured a large base population to draw a local/regional workforce from, however the majority of the potential workers in the regional study area are currently not trained in trades or professions required for development and construction of the project.

[41] Social Impact Assessment Guideline (March 2018) accessed via: https://www.statedevelopment.qld.gov.au/__data/assets/pdf_file/0017/17405/social-impact-assessment-guideline.pdf.

5.6.1 Submissions

Key social impact matters raised by submitters on the EIS comprised:

- support for the project as a major employment generator for rural and remote towns and support future of communities
- increased demand for emergency services during construction may cause capacity issues for the local community, and concerns over whether mitigation measures proposed in the EIS would mitigate these impacts
- limited detail in the draft EIS to explain how affected landholders would be engaged with during any future negotiation or land acquisition process
- potential impacts on affected landowners including noise and vibrations, electro-magnetic fields, air quality (dust), water quality and groundwater quality and flow issues.

This report has considered each submission received and the responses provided by the proponent in evaluation of the project. Assessment of the key matters is provided below.

5.6.2 Methodology

The SIA was developed in accordance with the SIA Guideline. The social baseline outlined the social areas of influence which included:

- land use and key social features along and near the corridor
- demographic characteristics, including population, age and gender, and cultural diversity
- community lifestyle, values and aspirations
- economic profile, including education, employment characteristics, and income
- social infrastructure, including health, emergency services and facilities.

The SIA regional study area baseline and impact assessment considered the towns of Charters Towers, Pentland, Hughenden, Richmond, Julia Creek, Cloncurry and Mount Isa. These are the closest population centres to the project and host social infrastructure that may be accessed by project workers, such as health services.

The Townsville was not considered in the regional study area as the construction and operation of the project is not proposed within the Townsville City Council LGA. Notwithstanding this, the construction workforce for the Woodstock substation would be accommodated in Townsville and materials and equipment for construction are likely to be transported through Townsville.

The methodology used by the proponent to prepare the SIA meets the requirements of the SIA Guideline.

Potential impacts and proposed management measures were identified through feedback from stakeholder engagement, and review of literature. The assessment of potential social impacts was informed by a risk assessment approach, which considered the likelihood and severity of identified potential impacts both pre-mitigation and post-mitigation implementation.

The management measures and monitoring approach proposed by the proponent were included in draft social impact management plan (SIMP) within the SIA. The draft SIMP measures provide for the management of social impacts throughout the construction and maintenance of the project.

This report includes a condition (Appendix 1) to require the proponent to prepare a final SIMP for the project construction and operation stages to be submitted for approval at least 3 months before the

commencement of project construction. This condition also requires that the final SIMP be made publicly available via the project website following approval. The final SIMP must include performance indicators and desired management outcomes for the identified key impact areas, as per the SIA Guideline.

5.6.3 Community and stakeholder engagement

The regional community first became aware of the project in 2010 when the previous CopperString Project was gazetted as a 'significant project'.[42] Between 2010 and 2011 community members and stakeholders were consulted on a draft TOR, draft EIS and on the supplementary EIS for the previous version of the project.

Landholders along the route were consulted during 2010 and 2011 on the project corridor route across particular properties, access for studies and some negotiations for compensation and easements for the power line. Despite the time delay, it is considered likely that many of this project's potentially impacted community members and stakeholders had some understanding of this project at the beginning of this EIS process due to past consultation.

The TOR required the proponent to implement a comprehensive and inclusive engagement strategy for to inform the SIA. This included documenting the engagement processes used to conduct open and transparent dialogue with stakeholders in a public consultation report. Stakeholder engagement to inform the EIS occurred from July 2019 to August 2019. The engagement process was guided by the proponent's community liaison management strategy.

The SIA reported on the proponent's engagement with a range of stakeholders, including:

- Australian government departments and agencies
- State government agencies
- LGAs
- directly affected landholders
- community and environmental groups
- Traditional Owners
- social infrastructure service providers
- potential network users, including some identified foundation customers and renewable energy generators
- business and regional economic development representatives
- emergency and health services.

The proponent also used a variety of methods to engage different stakeholders and ensure participation was inclusive. Engagement activities included:

- one-on-one discussions and focus group meetings
- targeted stakeholder briefings
- community roadshows and local industry forums
- project websites

[42] Projects gazetted as 'significant project' have been referred to as 'coordinated projects' since December 2012.

- a free call number for project information and an email address for enquiries
- media releases and public notices.

Overall, the community and stakeholder engagement undertaken by the proponent to inform the SIA and EIS is considered acceptable for this stage of the project's development. The proponent engaged with a wide and relevant range of stakeholders and provided them with timely and relevant information on the project. The engagement processes implemented also provided affected stakeholders opportunity to provide feedback on the project.

5.6.3.1 Ongoing community and stakeholder engagement

The EIS included a Community Liaison Management Plan, which identified additional engagement actions the proponent intends for during the detailed design and construction phases of the project including:

- community shopfronts and offices
- community support groups
- telephone surveys
- newsletters and fact sheets
- construction updates
- contact cards for construction staff
- notifications via letters and SMS.

The proponent has committed to prepare a community and stakeholder engagement plan to be implemented during construction of the project. This plan would include engagement methods and activities and a complaints management procedure.

To ensure ongoing community and stakeholder engagement is effective and informs management and monitoring of potential impacts during construction, imposed conditions are included within this report at Appendix 1. These conditions require annual SIMP reporting, to inform the Coordinator-General of the actions undertaken as part of engagement following the EIS process and throughout the construction phase.

5.6.4 Construction impacts and mitigations

5.6.4.1 Workforce management

The EIS included a summary workforce profile for the construction phase of the project with analysis of the regional labour market and capacity to support the project's workforce skilled labour requirements.

Potential workforce management impacts during construction identified in the SIA include:

- the project's workforce requirements may contribute to a cumulative demand for labour in the regional study area, with up to 750 FTE construction jobs and a peak workforce of 350 at any given construction hub; workforce required would comprise predominantly of civil workers, steel construction workers, aerial crew and fibre jointers
- limited project impact on local skills shortages due to the large local and regional population centres traversed by the project
- potential mental health impacts for workers due to engagement of non-residential workforce.

These impacts have a medium risk profile pre-mitigation. Mitigation measures proposed in the SIA to lower this risk profile include:

- continue to engage with Mount Isa Townsville Economic Zone Pty Ltd (MITEZ) to discuss workforce procurement and timing of other projects in the region
- maximise Aboriginal and Torres Strait Islander employment, through investment in training in the region
- work with local training providers to provide training for all regional workers to gain necessary qualifications to secure employment on the project
- identify opportunities for the employment of apprentices and trainees
- development of the workforce management plan to include but not be limited to the following measures to promote wellbeing within the workforce:
  - workforce accommodation would be developed in accordance with the principles of the Economic Development Queensland Non-Resident Worker Accommodation Guideline, noting that the requirements of the Guideline are not expected to be met in full for some camps due to the temporary nature of the workforce accommodation facilities
  - access to telecommunication infrastructure (e.g., free Wi-Fi, mobile phone network) would be provided within workforce accommodation
  - activities to integrate with the local community through memberships at local sporting and recreational clubs and community events. Through its workers accommodation services provider, the proponent would encourage and facilitate worker participation in local community sporting and recreational clubs and access local businesses and facilities
  - mental health training for managers and supervisors
  - procedures for increasing the mental health literacy and wellbeing knowledge of the workforce
  - access to a mental health and wellbeing support services, including but not limited to an employee assistance program.

The proponent has committed to a workforce management plan for the project which will include:

- training and education program that will maximise employment including Indigenous employment and train Indigenous and non-Indigenous workers who require additional qualifications to work on the project
- code of conduct that describes the expected standard of behaviour for all personnel (construction and operation)
- measures to develop a strong mental health culture and promote wellbeing within the workforce.

It is considered that the potential risks associated with workforce management is low, if the mitigation measures committed to by the proponent are implemented. These measures would be reflected within of the workforce management plan and local and Indigenous business participation plan required as part of the SIMP, by the condition imposed in Appendix 1.

5.6.4.2 Housing and accommodation

Potential construction impacts on housing and accommodation discussed in the SIA include:

- the potential for use of short-term accommodation by the project to displace other users, noting limited excess demand for housing and accommodation predicted due to the large local and regional

population centres traversed by the project increased business opportunities for short term accommodation providers.

The potential housing and accommodation impacts are considered to have a low to negligible risk profile pre-mitigation. The proponent has committed to the following mitigation measures to lower this risk profile:

- determine final location of construction camps in close consultation with the relevant local government stakeholders to minimise impacts to local communities, housing supply and availability and essential services
- develop a local Indigenous business participation plan for the project as a part of the SIMP that will:
  - outline an approach for the proponent to engage with local businesses to ensure that they are aware of supply opportunities for accommodation camps
  - give preference to local, regional and Aboriginal and Torres Strait Islander owned businesses in tendering evaluation where their offers meet the proponent's scope of work and are equal in terms of health, safety, and environment requirements, price, timing, quality and other evaluation criteria.

This report recognises that the proponent continues to engage with local governments regarding the final location, configuration and servicing of construction camps. A recommendation is included in this report for the proponent to report on engagement with LGAs when lodging future MID request(s).

It is considered that the potential social impact risks to housing and accommodation is low, if the mitigation measures in proposed in the SIA are implemented. The conditions in Appendix 1 of this report require these mitigation measures to be included in a SIMP and implemented.

5.6.4.3 Local business and industry procurement

Potential construction impacts on local business and industry procurement identified in the SIA include:

- an expected increase in economic output and real income for the region
- an expected increase in the availability of local and regional business and employment opportunities
- the time required for landholders to engage with the proponent regarding the project may impact on property management activities and property productivity.

The impacts have a medium to low risk profile pre-mitigation. Mitigation measures proposed in the SIA to lower this risk profile include:

- development of a local an Indigenous business participation plan that:
  - outline an approach for proponent engagement with local businesses to ensure that they are aware of supply opportunities
  - give preference to local, regional and Aboriginal and Torres Strait Islander owned businesses in tendering evaluation where their offers meet the proponent's scope of work and are equal in terms of health, safety, and environment requirements, price, timing, quality and other evaluation criteria
- investment in training programs in the region to maximise Aboriginal and Torres Strait Islander employment
- working with local training providers to provide training for regional Indigenous and non-Indigenous workers to gain the qualifications necessary to facilitate employment opportunities
- development and implementation of a CEMP, to include a land access management plan for each landholder documenting agreed access, rehabilitation, and communication arrangements

- development of a code of conduct that outlines the behaviour expected of proponent staff and contractors when interacting with landholders and other community members
- land access and compensation negotiations to be undertaken individually with affected landholders
- prioritisation of local and regional employment and identifying opportunities for the employment of apprentices and trainees.

It is considered that the potential negative impacts on local business and industry procurement is low, if the mitigation measures identified in the SIA are implemented. The conditions in Appendix 1 of this report require these mitigation measures to be included in a SIMP and implemented.

5.6.4.4 Health and community well-being

Potential construction impacts on health and community well-being identified in the SIA include:

- potential impacts on the wellbeing of landholders through feelings of stress associated with engagement with the proponent on access, compensation and project activities
- potential impacts to landholder and stakeholder amenity and privacy, including in recreational areas
- road safety impacts associated with movement of construction vehicles
- potential for project workers' presence in communities to impact on sense of community and safety
- workers' use of health and emergency services may impact capacity to service the existing community.

The impacts are considered to have a medium to low risk profile pre-mitigation. Mitigation measures proposed in the SIA to lower this risk profile include:

- development of a stakeholder engagement plan to communicate project related updates and complaints management procedure to effectively respond to and monitor complaints
- development of a land access management plan for each landholder documenting the agreed access, rehabilitation, communication and compensation arrangements
- development of a code of conduct, that outlines the behaviour expected of employees and contractors when interacting with each other, landholders and other community members that will address:
  - workforce code of conduct and behaviour management
  - fitness for work policy including drug and alcohol testing
  - expectations and standards when dealing with external parties and the broader community
  - promoting the participation of workforce in local clubs and events
- development and implementation of the CEMP for the project to include measures to monitor and mitigate (if required) impacts to noise, air quality and visual amenity values at sensitive receptors, as discussed in section 5.8.
- development of a road use management plan in consultation with DTMR and other key agencies as discussed in section 5.4.
- informing the workforce and any contractors of the limitations in medical services in the regional study area
- developing a health and safety plan to minimise injuries and health emergencies of the workforce
- provision of first aid facilities and a registered nurse, at construction camps and construction facilities

- development of an emergency response plan in consultation with local emergency service providers.

It is considered that the potential negative impacts on health and community well-being is low, if the mitigation measures identified in the SIA and commitments are implemented. The conditions in Appendix 1 of this report require these mitigation measures to be included in a SIMP and implemented.

5.6.5 Operational impacts and mitigations

Potential operational impacts of the project relevant to social matters identified in the SIA and broader EIS included:

- restriction of landholder activities within the final project easement may potentially increase the cost of property operation and maintenance
- reduced amenity and privacy for landholders
- impacts on community use and enjoyment of nearby recreational areas
- workforce requirements that may contribute to cumulative demand for labour in the region
- increased availability of local and regional employment opportunities
- increased availability of local and regional business opportunities.

The above impacts have a low risk profile pre-mitigation. Mitigation measures committed to by the proponent to lower this risk profile include:

- landholder compensation negotiations to be progressed with a focus on reaching voluntary agreements
- measures outlined in the project's concept biosecurity plan to address the risk to landholders associated with managing pest and weed species
- where the transmission line crosses any area that is used for aviation purposes (e.g. aerial stock mustering), transmission line identification markers would be installed to indicate the position and/or direction of the transmission line
- developing a land access management plan for each landholder that documents the agreed access, rehabilitation, communication and compensation arrangements
- developing a code of conduct, that outlines the behaviour expected of staff and contractors when interacting with each other, landholders and other community members
- developing a complaints management procedure to effectively respond to and monitor complaints.

It is considered that the potential negative social impact risk of project operations is low if the mitigation measures committed to by the proponent are implemented. The conditions in Appendix 1 of this report require these mitigation measures to be included in a SIMP and implemented.

5.6.6 Coordinator-General's conclusion: social impacts

The SIA was prepared generally in accordance with the SIA Guideline and the mitigation measures proposed in the SIA demonstrate the proponent approach to minimising impacts on local communities.

The SIA was informed by adequate community and stakeholder engagement and stakeholders were given sufficient opportunity to provide comment on the potential social impacts of the project.

The SIA concluded that the project would deliver social benefits for the surrounding region as a result of increased employment and business opportunities during construction of the project. This report

acknowledges the proponent's commitment to utilise a local workforce where possible and reasonable, with employees sourced from nearby areas for construction activities.

It is unlikely that the project workforce demand would result in local skills shortages or excess demand for housing and accommodation. This is due to the large local and regional populations traversed by the project and the proponent's commitment and plans to use construction camps to support the workforce required for construction of the project, to be delivered in consultation with local government and stakeholders.

To ensure the number of jobs available to the regional area is maximised, a condition has been imposed to require reporting on completion of actions in the SIMP workforce management plan to develop the skills base and future local workforce of the regional area (Appendix 1). This would support local and regional employment opportunities that otherwise may not be achievable with the current skills base in the region.

The identified potential impacts on health and community wellbeing as a result of the project can be appropriately managed through implementation of proponent commitments, along with the conditions and recommendations in this report.

To ensure the potential social impacts identified in the EIS are avoided, minimised or mitigated, and benefits enhanced, a condition has been imposed requiring the proponent to submit a final SIMP for the construction and operations phases of the project (Appendix 1). The SIMP is required to outline the mitigation measures for key social impacts and must include a monitoring and evaluation framework. This report also imposes a condition requiring the proponent to report annually on the implementation and effectiveness of the SIMP during the construction stage (Appendix 1).

5.7 Cultural heritage

Section 15 of the EIS provides the proponent's assessment of potential impacts of the project on Aboriginal peoples' cultural heritage values and Queensland (non-Indigenous) cultural heritage values. This section evaluates these potential impacts and the proponent's proposed mitigations and management strategies.

5.7.1 Existing environment

5.7.1.1 Aboriginal cultural heritage

The ACH Act imposes a 'duty of care' upon all persons undertaking development activities to take 'all reasonable and practicable measures' to ensure that their activities do not harm matters of Aboriginal and Torres Strait Islander peoples' cultural heritage.

The EIS stated that the project traverses through country significant to 8 Aboriginal Traditional Owner's, as shown in Figure 5.10, referred to as Aboriginal parties by the ACH Act:

- Birriah People
- Jangga People #2
- Yirendali People Core Country Claim
- Wanamara People Core Country Claim
- Mitakoodi People #3
- Mitakoodi People #5

- Kalkadoon People #4
- Yulluna People.

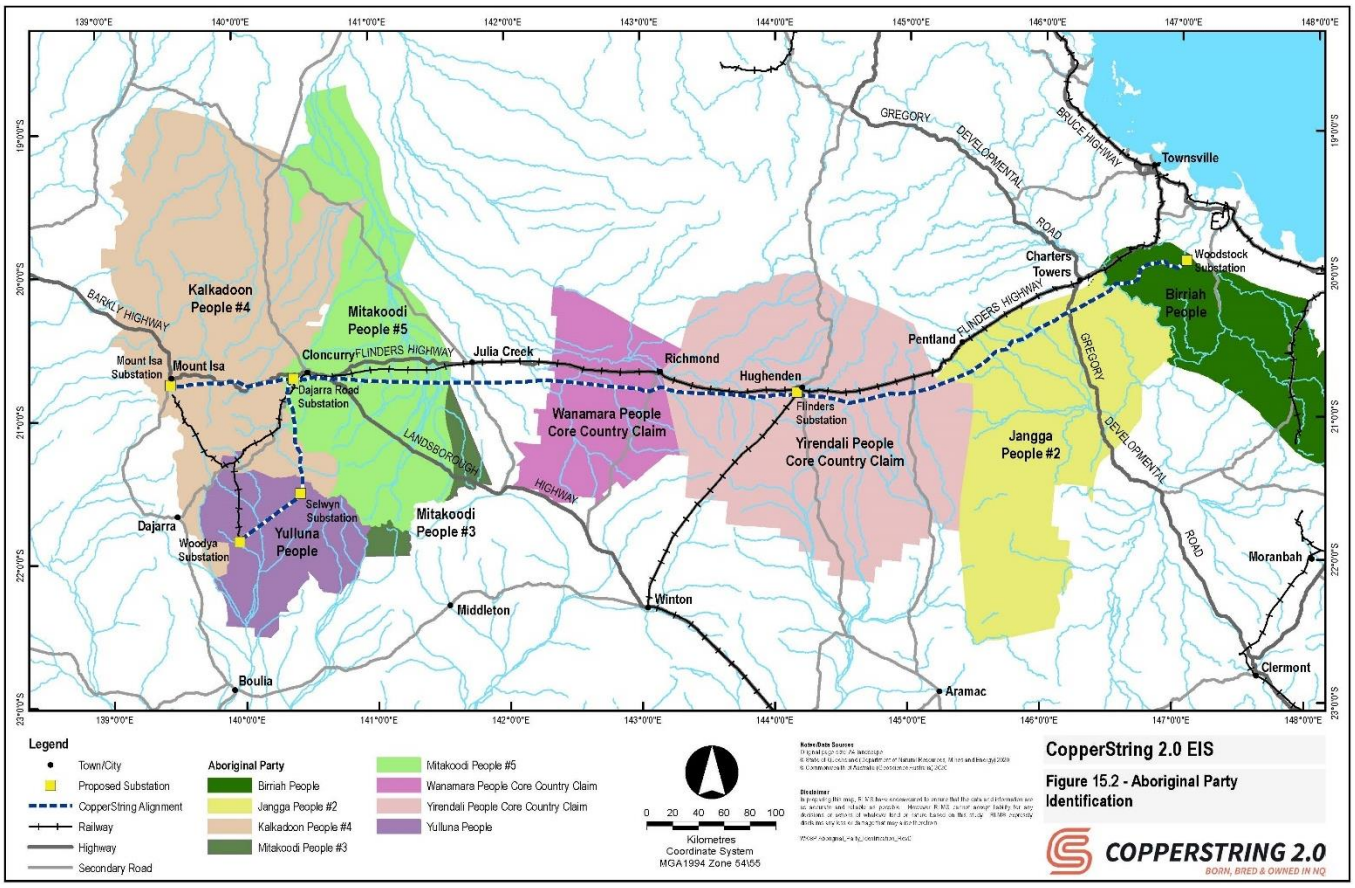

Figure 5.10 Aboriginal parties along project corridor

The EIS identified 236 registered cultural heritage sites and one registered cultural heritage polygon along the project alignment across land significant to 5 Aboriginal parties: Birriah People, Yirendali People Core Country Claim, Mitakoodi People #5, Kalkadoon People #4, and Yulluna People. These sites and polygon were identified from the Department of Seniors, Disability Services and Aboriginal and Torres Strait Islanders Partnerships (DSDSATSIP) Aboriginal and Torres Strait Islander cultural heritage database and register.[43]

A portion of the study area near Julia Creek has no identified Aboriginal party. However, in accordance with the provisions of the ACH Act, the proponent publicly notified their intention to develop a CHMP for the portion of the study area near Julia Creek, with six responses received. The responses will be reviewed by the proponent, in consultation with DSDSATSIP, to determine whether a person is an Aboriginal party, as defined by section 35 of the ACH Act, and endorsed.

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Cth) aims to preserve and protect places, areas and objects of particular Aboriginal significance from specific threats of injury or desecration. There are no existing declared protected areas under this Act which would be impacted by the project. If such an area is identified in the future, the area would be recognised and included in a registered ILUA and CHMP.

[43] https://culturalheritage.datsip.qld.gov.au/achris/public/home.

5.7.1.2 Queensland (non-Indigenous) cultural heritage

The Queensland heritage site survey and desktop analysis in the EIS identified 11 sites listed as having state cultural heritage value (Queensland heritage register) and 12 sites with local heritage value (site surveys).

5.7.2 Submissions

Key issues raised in submissions on cultural heritage matters included:

- identification of potential impacts to Lot 5 on SP222005, which was created to protect historic and cultural artefacts, particularly those relevant to Aboriginal and Torres Strait Islander people
- requirement for accurate description of the legislative framework for reporting and management of Queensland archaeological discoveries.

This report has considered each submission received and the responses provided by the proponent in evaluation of the project. Assessment of key matters is provided below

5.7.3 Methodology

Aboriginal and Torres Strait Islander cultural heritage values were identified through:

- review of the regulatory framework (for Commonwealth, State and local jurisdictions)
- desktop searches of relevant registers, databases and literature
- consultation with Aboriginal parties.

In developing the CHMPs, the proponent will be required to negotiate with the Aboriginal party/s to define the process for undertaking detailed cultural heritage surveys of the proposed project areas and measures to manage identified Aboriginal cultural heritage.

Queensland cultural heritage values were identified through desktop searches of relevant Commonwealth, State and local registers and databases and site surveys undertaken in 2010 for the CopperString Project.

5.7.4 Impacts

5.7.4.1 Construction impacts

5.7.4.1.1 Aboriginal cultural heritage

The EIS states that the project has the highest potential to harm or destroy Aboriginal cultural heritage[44] during the construction phase from vegetation clearing activities, and earthworks associated with establishing and installing access tracks, laydown areas, construction accommodation camps, transmission lines, CEVs and ancillary infrastructure. Queensland (non-Indigenous) cultural heritage.

5.7.4.1.2 Queensland (non-Indigenous) cultural heritage

The EIS identified three sites of local heritage significance within the project corridor: a dam, the former Hampden railway line and former Winton Hughenden railway line. The remaining identified sites are located greater than 100 m from the project corridor. The EIS concludes that the project is unlikely to impact on any identified Queensland (non-Indigenous) cultural heritage sites as project infrastructure has

[44] Aboriginal cultural heritage is defined in section 8 of the ACH Act.

been placed to avoid impacts to these sites, however, there remains potential for new sites or artefacts to be discovered during construction activities.

5.7.4.1.3 New cultural heritage sites identified along construction corridor

In addition to identified Aboriginal and Queensland (non-Indigenous) cultural heritage sites, the EIS identified there remains a high likelihood of additional heritage sites being found during pre-construction and construction activities, either resting atop the land or during earthworks. Construction works on or near these sites have the potential to harm or destroy Aboriginal cultural heritage or Queensland (non-Indigenous) cultural heritage.

5.7.4.2 Operational impacts

5.7.4.2.1 Aboriginal cultural heritage

The EIS found the continued use and maintenance of access tracks and project infrastructure could cause further erosion and ground disturbance, which has the potential to uncover new Aboriginal cultural heritage.

5.7.4.2.2 Queensland (non-Indigenous) cultural heritage

The EIS states the operation of the project is unlikely to impact on identified Queensland (non-Indigenous) cultural heritage, however, there remains potential for new cultural heritage to be discovered during maintenance activities including vegetation control.

5.7.5 Mitigation measures

5.7.5.1 Aboriginal cultural heritage

To manage impacts on Aboriginal cultural heritage, the EIS states the proponent would firstly avoid harm where possible and develop CHMPs with the appropriate Aboriginal party/s along the project corridor for implementation. A CHMP would set out management strategies to ensure the protection of Aboriginal cultural heritage along the project corridor. The CHMP would define the roles and responsibilities of the parties; the process for undertaking detailed Aboriginal cultural heritage field surveys; and detail how any identified Aboriginal cultural heritage would be recorded and managed.

Once the Aboriginal party/s are identified for the portion of the study area near Julia Creek, the proponent will commence preparation of a CHMP with the Aboriginal party/s.

To manage potential impacts on Aboriginal cultural heritage on Lot 5 on SP222005, the proponent has developed a cultural heritage management agreement with the Kalkatungu People (Kalkadoon Aboriginal Corporation Corporation (RNTBC)), which sets up the framework for developing a CHMP. Potential impacts on Lot 5 on SP222005 would be assessed and managed through the CHMP.

I am satisfied that the negotiation and implementation of CHMPs with the appropriate Aboriginal party/s would adequately manage potential impacts on Aboriginal cultural heritage.

5.7.5.2 Queensland (non-Indigenous) cultural heritage

In response to submissions, the proponent provided additional information to clarify the legislative framework for the reporting and management of Queensland (non-Indigenous) archaeological discoveries.

To manage impacts on Queensland (non-Indigenous) cultural heritage, the proponent has committed to develop and implement a CEMP which details procedures to be followed when reporting and managing

Queensland cultural heritage discoveries, consistent with section 89 of the *Queensland Heritage Act 1992*. The CEMP would also require detailed site surveys to be undertaken during the detailed design phase to identify any Queensland cultural heritage in proximity to the project corridor.

I am satisfied the implementation of the CEMP would adequately manage potential impacts on Queensland cultural heritage values. This report includes a recommendation Appendix 2 for the CEMP for the project to include procedures to be followed for identification, reporting and managing Queensland cultural heritage.

I am satisfied that the implementation of the recommended provisions in the CEMP would adequately manage potential impacts on Queensland cultural heritage values.

5.7.5.3 New cultural heritage sites identified along construction corridor

In addition to the implementation of the CHMPs and CEMP, the proponent has committed that employee and contractor's site inductions would include awareness of obligations in preserving significant cultural heritage and procedures to be undertaken should new cultural heritage be discovered. This would allow a suitably qualified cultural heritage practitioner to assess the discovery, record the discovery and relocate it (if appropriate).

5.7.6 Coordinator-General's conclusion: cultural heritage

The EIS has adequately investigated and assessed the potential impacts of the project on Aboriginal and Queensland (non-Indigenous) cultural heritage for this stage of the project's development.

The proponent has made specific commitments to develop and implement CHMPs in consultation with the relevant Aboriginal party/s, which is consistent with the ACH Act and is considered appropriate. The proponent has also made specific commitments to develop a CEMP which would include mitigation measures to manage impacts on Queensland (non-Indigenous) cultural heritage.

5.8 Other impacts

5.8.1 Existing infrastructure crossings

The project corridor crosses existing infrastructure including local and SCRs, (sealed and unsealed), railways, existing electrical transmission and distribution lines and gas pipelines (refer to Table 5.11).

Table 5.11 Key existing infrastructure crossings

Infrastructure	Number of crossings
Sealed road crossings	
State controlled road	14
Local government road	1
Private road	2
Unsealed road crossings	
State controlled road	1
Local government road	35
Private road	Not counted but expected to be 100
Other	

Infrastructure	Number of crossings
Railway crossing (including 3 crossing on dismantled lines)	6
Transmission and distribution crossings	45
Gas pipeline crossings	1

Road and rail crossings are discussed in section 5.4 of this report.

The proponent has committed to finalising the design of the project corridor in consideration of existing infrastructure, by avoiding where possible, or providing a suitable transmission tower separation where crossings are required. The proponent has also committed to consult with the owners of existing infrastructure that the project may cross to detail the transmission line crossing(s) proposed and arrange planned outages (if any) during construction, once the detailed design and staging of the project is finalised.

The proponent's commitment to consult with the owners of any infrastructure that the project may cross, is reinforced by a recommendation in Appendix 2, Part A of this report that consultation occur during the detailed design phase of the project.

5.8.1.1 Coordinator-General's conclusion: existing infrastructure crossings

The EIS adequately assessed the impacts of the project associated with crossing existing infrastructure.

Proponent commitments to consult with existing infrastructure owners are reinforced by recommendations in Appendix 2, Part A of this report (recommended conditions for subsequent MID). Implementation of the recommendation would ensure potential impacts of the project on existing infrastructure would be adequately managed.

5.8.2 Air quality and greenhouse gases

The project has potential to generate air quality and greenhouse gas impacts during construction and operation. The EIS identified 57 sensitive receptors (55 of these being residential premises, one place of recreation and one workplace) within the project area, with 46 greater than 750 m from the project corridor and 11 within 750 m of the project corridor (comprising one workplace and 10 residences). The sensitive receptors located closest to the project corridor are existing workers accommodation sites within approximately 150-350 of the existing Mount Isa power stations and electrical substations.

Key matters raised in submissions regarding air quality and greenhouse gas emissions included:

- support for the project's potential to facilitate increased renewable energy generation in the region, reducing greenhouse gas emissions from non-renewable energy generation
- air quality and dust concerns nearby residences and for other sensitives receptors, particularly during construction
- potential greenhouse gas emissions associated with the project.

5.8.2.1 Impacts and mitigation

The EIS stated that the project is expected to generate air quality and greenhouse gas impacts during construction activities. Impacts include dust emissions (particulate matter) and gaseous emissions from operating equipment and vehicles. These impacts have the potential to be most significant for the 11 sensitive receptors within 750 m of the project corridor.

The project would also generate greenhouse gas (GHG) emissions from vegetation clearing, operating plant equipment and vehicles, and use of electricity during the construction phase.

- The EIS identified design responses to minimise air quality impacts, including:
- use of existing roads and access tracks as agreed with relevant landholders
- location of temporary construction activities (including concrete batching plants, laydown areas) to be determined in consideration of appropriate buffer distances to sensitive receptors
- control of construction access routes in accordance with a field development plan, to be prepared prior to commencement of construction and in consultation with landholders, and local government council standards for roads, where required
- vegetation clearing to be minimised
- rehabilitation committed following construction where vegetation is removed for temporary activities
- construction works program to minimise haul distances between construction sites and laydown areas
- construction waste to be minimised.

In addition to the design responses identified in the EIS, the proponent has committed to the following mitigation and management measures including:

- development of dust and stockpile management procedures in the CEMP, including watering for dust suppression
- rehabilitation and stabilisation of disturbed areas to be progressive, mitigating potential dust generation and planting to mitigate greenhouse gas emissions associated with vegetation clearing
- maintenance of a complaints register including for any air quality concerns
- development of a greenhouse gas offset plan
- additional mitigation measures to reduce greenhouse gases associated with fuel combustion and gas-insulated electrical components, to be determined during detailed design.

The proponent has committed to undertake air quality monitoring in the event that any air quality complaints are received, with management actions to be undertaken where air quality trigger levels are exceeded, including:

- investigation into cause of any dust complaint, with additional dust mitigation measures to be implemented if nuisance dust is observed during works near sensitive receptor(s)
- review of scheduled activities in the event of forecast adverse wind conditions, with activities to be postponed if likely to create air quality (dust) impacts on sensitive receptors.

The proponent is required to report on all landholder consultation, including any air quality concerns, as part of their annual reporting on the SIMP, as discussed in section 5.6.

During operation the project has the potential to generate GHG emissions due to resistance in the metal transmission wires causing heat, resulting in energy loss in transmission over long distances. Where the electricity being transmitted is generated via fossil fuels, this results in GHG emissions. The proponent has committed to consider energy efficiency initiatives and the use of renewable energy sources. To offset scope 1 and 2 GHG emissions, the proponent has committed to a GHG offset plan for construction and operation phases. The proponent must also report greenhouse gas emissions in accordance with the *National Greenhouse and Energy Reporting Act 2007* (Cth).

The proponent's design responses in the EIS and commitments to manage air quality and greenhouse gases are reinforced by a recommendation in Appendix 2, Part B of this report.

The Renewable Energy Hub project section is expected to provide the opportunity for connection to the NEM for renewable energy generation projects proposed in the Northern QREZ. The project would also connect the North West Queensland region to renewable energy generation, reducing reliance on fossil fuel electricity generation in the region.

5.8.2.2 Coordinator-General's conclusion: air quality and greenhouse gases

The EIS adequately assessed the impacts of the project on air quality and greenhouse gas emissions, for this stage of the project's development.

Air quality impacts that may affect sensitive receptors would be mitigated through the proponent's design responses in the EIS and commitments, reinforced by recommendations in Appendix 2, Part B of this report.

Proponent commitments to prepare and implement a GHG offset plan, reduce energy and fuel consumption, and use renewable energy sources would minimise GHG emissions generated by the project. These design responses in the EIS and commitments are reinforced by recommendations in Appendix 2, Part B of this report (recommended conditions for subsequent MIDs).

Implementation of recommendations in this report (Appendix 2, Part B) and the proponent's commitments are appropriate to manage the project impacts on air quality and greenhouse gas emissions.

5.8.3 Noise and vibration

The landscape in which the project corridor is located is rural, with low levels of background noise. Some areas are affected by existing industrial noise sources (in Mount Isa near the power stations), while other areas are affected by mining activities, such as near Cloncurry. In total, 55 sensitive receptors were identified within 2 km of the project corridor for the purposes of the noise and vibration assessment. All sensitive receptors are located greater than 140 m from the project corridor.

Key matters raised in submissions on noise and vibration included:

- concern about noise and vibration affecting fauna and livestock
- potential for noise and vibration impacts on construction camps if located near rail lines.

5.8.3.1 Impacts and mitigation

The EIS identifies that the primary risk of noise impacts is associated with construction of the transmission line and associated infrastructure. Sensitive receptors in proximity to the project corridor have the potential to be impacted by construction traffic impacts (truck movements), helicopter noise from stringing powerlines and general construction noise. Blasting is considered unlikely to be needed to construct foundations for the transmission towers. If blasting is required however, it would be expected to produce noise and vibration, which may affect the surrounding environment.

The EIS identified that there is also the potential for noise and vibration impacts associated with operation of the project. Operational transmission lines may generate a crackling sound during light rainfall and humid conditions when rainfall mixes with dust on the transmission line, creating a migrating electricity leakage path. The proponent has demonstrated that no nearby sensitive receptors would experience noise in this event as they are all located greater than 140 m from the project corridor.

The project corridor was designed to limit potential noise and vibration impacts to sensitive receptors. The proponent has committed to the following mitigation measures:

- traffic control plans, to be prepared prior to construction, would consider proximity to sensitive receptors for access routes along the project corridor
- targeted landholder communication prior to especially noisy activities, such as blasting activities (if required) and helicopter (aerial) stringing of lines
- maintenance of a complaints register; should non-vexatious noise complaints be received, noise monitoring may be undertaken at the locations concerned. Where supported by monitoring, further mitigation measures would be implemented to address noise impacts.

The proponent's design responses in the EIS and commitments to address potential noise and vibration impacts are reinforced by a recommendation in Appendix 2, Part B of this report.

The proponent continues to engage with landholders regarding noise and vibration impacts, including how to minimise potential impacts on livestock and fauna. The proponent is required to report on all landholder consultation, including on noise and vibration concerns, as part of their annual reporting on the SIMP, as discussed in section 5.6.

5.8.3.2 Coordinator-General's conclusion: noise and vibration

Noise and vibration impacts would be generated primarily during project construction. The proponent has committed to mitigation measures to address the risk and severity of potential impacts. The proponent continues to engage with landholders on potential noise and vibration impacts to livestock and fauna, and will need to report on consultation as part of the conditioned annual SIMP reporting (Appendix 1). The EIS adequately assessed noise and vibration impacts and proposed appropriate mitigation and management measures to be included in a CEMP.

Potential noise and vibration impacts of the project would be adequately managed through implementation of the recommendations in this report (Appendix 2, Part B) and the proponent's commitments.

5.8.4 Visual amenity

The EIS identified and assessed 6 key landscape character areas traversed by the project corridor:

- Woodstock to the Burra Range
- Hughenden to Richmond and surrounds
- Julia Creek and surrounds
- Cloncurry and surrounds
- Dajarra Road to Mount Isa
- Dajarra Road to Cannington and Phosphate Hill.

No submissions were received on the EIS regarding visual amenity impacts.

5.8.4.1 Impacts and mitigation

The EIS states that the project may impact on visual amenity through the construction of large structures connected by powerlines. Viewpoints along the project corridor between Woodstock and Mount Isa include a large range of landscapes including townships with historic buildings, rural cattle grazing and

pastures, mountainous regions, eucalypt canopy, mid-story acacia scrub and grasslands. Several of the viewpoints have historic and cultural value and are of interest to tourists.

The EIS states that visual sensitivity of key viewpoints along these routes is increased due to the greater number of likely viewers and the emphasis that travellers, tourists, recreational users and local residents have on landscape appreciation.

The three locations considered to be most sensitive to visual amenity impacts include White Mountain National Park, Barkly Highway (Mount Isa Riversleigh Byway), Cloncurry to Mount Isa and Chinaman's Creek Dam Reserve. There are a number of significant townships, smaller urban localities and numerous private properties within the project area that may have a direct view of the project infrastructure (i.e., transmission towers, CEV huts and substations).

The EIS states that views from townships and local roads would range from low to minimal sensitivity due to the spatial separation from project infrastructure, the visual context of the surrounds and presence of intervening views such as vegetation.

The EIS states that the selection of the project corridor considered visual impacts by minimising the use of taller towers and distancing from sensitive receptors and nearby towns. Considerations included reducing the number of intersections with other infrastructure, which would have required the use of taller towers, and positioning the corridor to the south of the Flinders Highway. In addition, the project corridor has been modified to minimise intersections with current farm infrastructure, conservation and other areas of high biodiversity value and cultural heritage values and sites.

The proponent has committed to consider visual amenity during detailed design including determination of final tower heights, tower placement and vegetation screening for substations. The proponent has also committed to maintaining separation distances to sensitive land uses as far as practicable to minimise impacts to visual amenity for visitors and local residents.

The proponent's commitment to consider impacts on visual amenity through detailed design is considered adequate in addressing potential impacts on visual amenity generated by the project.

5.8.4.2 Coordinator-General's conclusion: visual amenity

The EIS adequately assessed the impacts of the project on visual amenity. The project has been designed considering visual amenity impacts where possible. Tower locations would be further refined during the detailed design phase of the project, further mitigating visual amenity impacts generated by the project. The design responses to minimise the impact on visual amenity near sensitive receptors is considered appropriate. The proponent continues to engage with landholders on potential amenity impacts, and will need to report on this consultation as part of the conditioned annual SIMP reporting (Appendix 1), as discussed in section 5.6 of this report.

Potential impacts on visual amenity would be appropriately managed through implementation of the proponent's commitments and the conditions in this report.

5.8.5 Hazard and risk

The EIS presented an assessment of potential hazards and risks for the project including the use and storage of hazardous substances, bushfire, flooding and other potential environmental and safety issues.

Potential hazards and risks associated with the project were assessed using a preliminary hazard analysis (PHA) which considered:

- locations of sensitive receptors

- proposed project activities throughout construction, operation, and rehabilitation, including traffic impacts
- hazardous substances that would be used for the project
- natural hazards that pose a risk to the project or that may be influenced by the project, including bushfires and floods
- contaminated land and unexploded ordnances.

Key matters raised in submissions on the EIS relevant to hazard and risk related to risks considered in the PHA including traffic impacts during construction and bushfire risk, and comments on the development of appropriate evacuation and emergency response measures, including consultation requirements.

5.8.5.1 Impacts and mitigation

The PHA results are presented in a risk register in the EIS. Hazards were assigned a predicted risk rating based on risk assessment criteria before implementation of mitigation and management measures. The predicted risk rating was then re-evaluated after implementation of mitigation and management measures to determine how the risk could be reduced.

Key risks detailed in the EIS, with medium or high predicted residual risk (following mitigation and management) include:

- traffic accidents involving construction vehicles
- risks associated with aerial activities both by landholders along the project alignment (e.g. stock mustering) and the use of helicopters during project construction to string transmission wires
- contact with transmission lines by a person, animal, vehicle or aircraft
- fire risks associated with transformer fire or explosion, including bushfire ignition.

Consultation with emergency service providers was undertaken to develop proposed integrated emergency response planning procedures for the EIS.

Potential impacts on traffic and transport, including risk mitigation and management, are discussed in section 5.4 of this report. To address other hazards and risks for the project, the proponent has committed to:

- safe use and storage of any hazardous materials in accordance with Australian Standards and industry codes of practice
- ongoing consultation with landholders regarding the location of project activities and infrastructure to inform safe property and stock management measures (e.g. aerial mustering)
- develop and implement a project risk management plan including an operational safety management system requiring fatigue management plans and the accreditation of personnel compliant with industry best practice environmental and safe work methods, particularly for those conducting aerial activities
- develop an emergency management plan in consultation with relevant emergency service providers and stakeholders including the Department of Community Safety (includes the QAS, Queensland Fire and Rescue Service, Rural Fire Service and Emergency Management Queensland), local government, and other relevant community stakeholders, to include measures to respond to risk of flood, bushfire and landslide and to local government disaster management plans

- develop a bushfire management plan considering both network design and operating features relevant to fire prevention, as well as environmental procedures such as vegetation management, to manage and mitigate the potential consequences of an ignition.

The proponent's assessment of the potential hazards and risks of the project and the proponent's commitments and management measures to address them are acceptable for this stage of the project's development.

The proponent has committed to prepare an emergency response procedure in consultation with emergency service agencies. The emergency response procedure would be implemented in the event of an incident to maintain the well-being of personnel, contractors and the public and would describe the actions that would be implemented in the event of injury or illness, fire, unintended initiation of explosives, loss of containment of hazardous substance, natural event (e.g. flooding, bushfire, cyclone), vehicle accident or unapproved discharge off-site. The emergency response procedure would include information such as:

- contact details for key stakeholders in case of any emergency
- emergency and evacuation planning, maps and response procedures
- a description of the proposed communication mechanisms and required infrastructure
- treatment plans for injured workers due to chemical process used on site, including proposed consultation
- description of notification requirements for planned exercises
- fatigue management policy.

The proponent's commitment to liaise with Queensland emergency service agencies in developing and implementing the project emergency response procedure is expected to occur. This commitment is reinforced by recommendations in Appendix 2, Part B of this report (recommended conditions for subsequent MID).

5.8.5.1.1 Contaminated land and unexploded ordnances

The EIS stated that within the project area there are no properties listed on the Contaminated Land Register (CLR) and there are seventeen properties listed on the Environmental Management Register (EMR) due to notifiable activities (including livestock dip, mine wastes, chemical storage and landfill).[45]

The EIS stated that during the detailed survey of the project area and associated temporary construction sites, the proponent would inspect for signs of contamination on properties listed on the EMR, or where discussions with landholders indicated potential contamination on properties not listed on the EMR. Where sites cannot be avoided, soil investigations would be undertaken to confirm contamination status to further inform project design or management requirements (i.e., removal and disposal). If contaminated land is identified, soils would be disposed of by a licensed waste contractor or otherwise remediated based on findings of the soil investigation.

The proponent has committed to avoid disturbing potentially contaminated land as far as practical, as well as siting project infrastructure and activities away from potentially contaminated land. This commitment is reinforced by a recommendation in Appendix 2, Part B of this report that this commitment occur during the construction phase of the project.

[45] https://www.qld.gov.au/environment/management/environmental/contaminated-land/registers/about-registers#:~:text=About%20the%20EMR&text=Contaminated%20land%20is%20land%20which,for%20its%20current%20land%20use.

The proponent has also committed to prepare a CEMP which would include rehabilitation measures for areas disturbed during construction of the project, including remediation of any contaminated areas. The proponent's commitment to prepare a CEMP during detailed design of the project, which would include rehabilitation measures for areas disturbed during construction, is reinforced by a recommendation in Appendix 2, Part B of this report.

Department of Defence unexploded ordnance (UXO) mapping identifies seven properties along the project corridor, located to the east of Charters Towers, that may contain UXOs. UXOs are a potential safety risk because they may detonate, if disturbed.

The proponent has committed to avoiding UXOs during the construction of the project through further refinement of transmission tower siting and consultation with relevant landholders and stakeholders including the Department of Defence to further define UXO risk. This report reinforces this commitment with a recommendation in Appendix 2, Part B of this report that UXOs be avoided and relevant landholders and stakeholders, including the Department of Defence, be consulted during the detailed design phase of the project.

5.8.5.2 Coordinator-General's conclusion: hazard and risk

The proponent has undertaken an appropriate assessment of potential hazards and risks associated with the project for this stage of the project's development. The proponent's commitments to develop management plans, engage with emergency services and address project risks related bushfire or flooding are acknowledged.

Proponent commitments are reinforced by recommendations in Appendix 2, Part B of this report. With the implementation of recommendations of this report and the proponent's commitments, potential hazards and risks associated with the project would be adequately managed.

5.8.6 Waste management

The project traverses seven LGAs, each with their own established waste management facilities.

Key matters raised in submissions related to waste management included:

- request for clarification of how the project would limit waste generation
- request for clarification of anticipated volumes of waste and whether the existing local waste facilities would be used
- concern that vegetation waste associated with construction would have an adverse impact on fauna, livestock and property management.

5.8.6.1 Impacts and mitigations

Waste would be generated primarily during project construction. Waste generated by the project is proposed to be managed using a combination of existing local government council waste facilities and additional private contractors, if required.

If unmitigated, project waste could impact on the surrounding social, economic and environmental values. The risk of these impacts are largely avoidable through proper storage, transport and disposal of waste.

The proponent committed in the EIS to employing a waste and resource management hierarchy to reduce and mitigate project waste impacts:

(1) **avoid** unnecessary resource consumption

(2) **reduce** waste generation and disposal

(3) **re-use** waste resources without further manufacturing

(4) **recycle** waste resources to make the same or different products

(5) **recover** waste resources, including the recovery of energy

(6) **treat** waste before disposal, including reducing the hazardous nature of waste

(7) **dispose** of waste if there is no viable alternative.

The proponent has also committed to the following actions:

- all waste is expected to be transported to external licensed waste management facilities, these would be determined during detailed design
- a waste management procedure would be prepared as part of the CEMP that would include specific measures for storing, transporting and disposing of wastes developed in consultation with operators of local waste management facilities
- where necessary, restricted invasive plants material would be disposed of in accordance with the biosecurity measures in the CEMP.

The mitigation measures committed to in the EIS are considered appropriate to address predicted project waste impacts.

This report includes recommendations (Appendix 2, Part A) that consultation with waste facilities and local government regarding outcomes for waste transport and disposal for the project occur prior to commencement of construction.

5.8.6.2 Coordinator-General's conclusion: waste management

The EIS adequately assessed the project impacts on waste generation and disposal for this stage of the project's development.

The waste impacts of the project would be appropriately managed through implementation of the proponent's commitments, including waste management procedures in the CEMP and the recommendations in this report (Appendix 2, Part A and Part B).

6. Matters of national environmental significance

6.1 Introduction

This Chapter addresses the potential impacts of the proposed CopperString Project (the project) on matters of national environmental significance (MNES) protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

On 31 March 2019 under section 68 of the EPBC Act, CuString Pty Ltd (the proponent) referred the project for consideration as a controlled action. On 14 May 2019, a delegate for the Commonwealth Minister for the Environment determined the project was a controlled action under the EPBC Act, reference number EPBC 2019/8416, for the following controlling provisions:

- listed threatened species and communities (sections 18 and 18A)
- listed migratory species (sections 20 and 20A)

The delegate for the Commonwealth Minister for the Environment also determined that the project should be assessed under the Queensland Assessment Bilateral Agreement (the agreement). Under the agreement (made under section 45 of the EPBC Act), if a controlled action is a 'coordinated project' for which an environmental impact statement (EIS) is required under the *State Development and Public Works Organisation Act 1971* (SDPWO Act), certain types of projects do not require assessment under Part 8 of the EPBC Act. The agreement enables the EIS to meet the impact assessment requirements of both Australian and Queensland legislation.

On 26 July 2019, CuString requested a variation of proposal to take an action under the EPBC Act to include associated connection points and spur lines in the project scope. On 24 September 2019, a delegate of the Minister for the Environment accepted the variation.

The following subsections summarise the Queensland Government's assessment of the referral against the relevant controlling provision/s.

6.2 Project description

The proponent proposes to construct and operate the project, approximately 1,000 kilometres (km) of extra high voltage overhead electricity transmission line located in the north-west of Queensland. The project would connect the North West Power System (NWPS) to the state electricity grid and enable participation in the National Electricity Market (NEM) for electricity consumers and generators along the project corridor.

The proponent contends in the EIS that the project would substantially reduce the cost of electricity delivered to the region which is expected to facilitate growth in the resources sector by reducing the cost of mining and minerals processing. This is predicted to support existing resource operations as well as facilitate growth in extraction of new-economy minerals. The project is also expected to facilitate development of potential renewable energy resources in the region that are currently constrained by the lack of access to the state electricity grid by providing options for generators to connect to the NEM.

The project comprises:

- a 120 metre (m) wide linear corridor easement, narrowing to between 80 m and 60 m wide in some sections, from a new substation (named Woodstock Substation) south of Townsville, to a new substation (named Mount Isa Substation) south of Mount Isa. The project also includes a southern extension from Cloncurry south to the Selwyn Substation with connection points to Mount Dore Mine and Phosphate Hill Mine. Construction for the project would only occur on the southern 60 m side of the 120 m easement to allow for future expansion on the northern side. Any future expansion would be subject to a separate assessment and approvals process. The easement would contain:
  - transmission towers up to 75 m in height every 500 m to 600 m, dependent on the topography and conductor clearance required with structure type, height and size of towers confirmed during the detailed design phase
  - transmission lines installed primarily by helicopters
  - brake and winch sites for tensioning the transmission lines during construction every 5 km to 10 km along the transmission line primarily located within the transmission line easement
  - access tracks for construction (6 m width minimum) and ongoing maintenance (3 m width minimum) to allow for access to the transmission line and tower sites generally contained within the transmission line easement and unsealed, where the existing road network and private access tracks cannot be utilised
- optical ground wire (OPGW) repeater stations with controlled environmental vault (CEV) huts every 80 km to 120 km along the transmission network and at substations to boost the optical signal. The CEV huts would be prefabricated and mounted on concrete piers inside a fenced area located on the northern side of the corridor outside, adjacent to the easement
- new substations at Mulgrave (south of Woodstock), Flinders (south-west of Hughenden), Dajarra Road (west of Cloncurry), south of Mount Isa, Selwyn and Woodya, including security fences, gravel access road and bitumen internal roads, onsite car parking and a small maintenance facility that would include an office, amenities and a hardstand for storage handling (as identified in Figure 6.1)
- 9 construction hubs for travel and accommodation with 7 hubs requiring dedicated construction camps housing up to 350 workers and 2 hubs using existing local accommodation (further discussed in section 6.2.2.2 below)
- construction facilities which would include laydown/delivery areas and concrete batching plants, for each construction hub along the transmission line, co-located at either construction camp or substation sites.

For the purpose of this report, project corridor refers to the area for all project components listed above required for the construction and operation of the project.

Further detail on the project description is provided at section 2.2 of this report.

6.2.1 Project sections

The project traverses 7 local government areas; Burdekin, Charters Towers, Flinders, Richmond, McKinlay, Cloncurry and Mount Isa, and is divided into the following 6 sections:

(1) Woodstock Substation: would connect the project to Powerlink's existing 275 kilovolts (kV) transmission network and would transform voltage between 275 kV and 330 kV.

(2) Renewable Energy Hub: the first 342 km of the project from the Woodstock Substation to the Flinders Substation (south-west of Hughenden) would consist of a double circuit 330 kV transmission line.

(3) CopperString Core: the next 395 km of the project to the west would consist of a double circuit 330 kV transmission line and the Dajarra Road Substation (west of Cloncurry). The transmission system would be designed to deliver 500 megavolt amperes (MVA) of electricity to the CopperString Core.

The CopperString Core would connect to the existing NWPS 220 kV network at Cloncurry. The Dajarra Road Substation would transform the voltage between 330 kV and 220 kV (the NWPS transmission voltage). The existing NWPS would then be used for transmission, through the Chumvale Substation, for Dugald River Mine, Ernest Henry Mine, and the Southern Connection.

(4) Mount Isa Augmentation: would consist of a new substation south of Mount Isa, near the Mica Creek Complex, with a double circuit 220 kV transmission line connection to the Dajarra Road Substation. The Mount Isa Augmentation would upgrade and supplement the transfer capacity between the Chumvale Substation and the Mica Creek Complex.

(5) Southern Connection: a double circuit 220 kV transmission line that would connect the Dajarra Road Substation to the Selwyn Substation. The Southern Connection would enable connection for mines, such as Mount Dore Mine and Phosphate Hill Mine that are presently not connected to the NWPS. The Selwyn Substation would include distribution equipment to connect the Mount Dore Mine.

(6) Woodya Connection: would consist of the Woodya Substation and a double circuit 220 kV transmission line, energised to 132 kV, that would connect to the Southern Connection at the Selwyn Substation. The Woodya Substation would then include distribution equipment to connect the Phosphate Hill Mine.

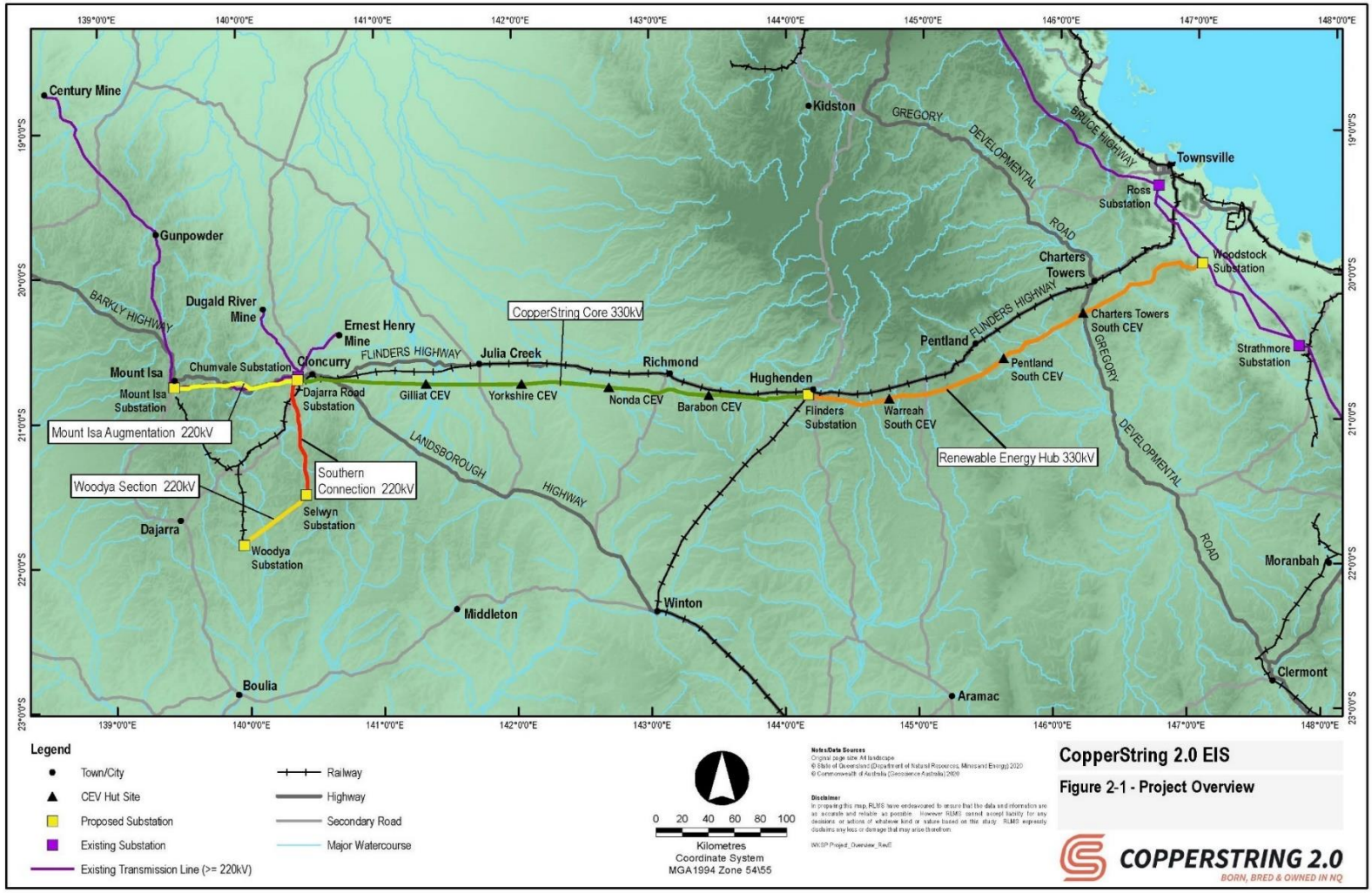

Figure 6.1 Project overview[46]

[46] From the project EIS, Volume 4. Updated version provided by proponent for this report.

6.2.2 Project staging

6.2.2.1 Pre-construction

Pre-construction activities are anticipated to commence following the release of this report and take approximately 4 months to complete. The pre-construction stage of the project would include:

- finalisation of the detailed design for the project
- geotechnical, property and other surveys for the easement, transmission towers and substations
- land acquisition for the easement, CEV huts and substations
- acquiring development approvals, licences, permits and native title/cultural heritage clearances
- commissioning of temporary construction camps and site offices
- workforce sourcing and induction and construction team mobilisation
- procurement of construction materials and transportation of materials.

6.2.2.2 Construction

Construction works are proposed to commence as soon as the relevant planning and environmental approvals are granted and access to land has been obtained. The proponent anticipates that construction would take approximately two and a half years to complete. The project corridor has been divided into 9 construction hubs for delivery of the project. These are Charters Towers, Cloncurry, Hughenden, Julia Creek, Pentland, Richmond, Selwyn, Mount Isa and Woodstock or Ayr.

Construction would be undertaken by up to 2 work fronts for each construction hub, with the work fronts moving from one construction hub to another upon completion of works. Each work front would consist of several small teams each focusing on a specific construction activity - vegetation clearing and access, foundation establishment, installing steelwork for transmission towers, stringing of transmission line or rehabilitation activities). A high-level breakdown of construction activities is provided in Table 6.1.

The proposed timeframes identified in the EIS indicates construction would commence at the Cloncurry, Pentland and Hughenden construction hubs and end at the Richmond and Selwyn construction hubs.

Table 6.1 Construction activity breakdown across key project components

Project component	Construction activity
Transmission line	• vegetation clearing within the operational clearance boundary[47] of the transmission line, along access tracks and on sites disturbed for construction purposes (e.g. earthen pads for construction activities) • construction of access tracks • foundation installation via a process of excavation or boring, forming, pouring of concrete and removal of formwork • conductor and earth wire/OPGW stringing • transmission tower completion works (e.g. signage) • rehabilitation of disturbed areas not required for access tracks or maintenance areas

[47] The operational clearance boundary of the transmission lines will be defined once transmission tower locations and heights are finalised in the detailed design of the project. Any vegetation within the operational clearance boundary that may hinder the safe operation of the transmission line will require clearing.

Project component	Construction activity
Transmission tower construction	• assembly crews using small cranes to piece together sections of the structure and attach relevant transmission line hardware at ground level • a larger crane to lift and secure together the sections in place from the ground up • stringing/installing the conductors and earth wires to the transmission towers via helicopters as the primary means of installing insulator strings or alternatively elevated work platforms
Substation and CEV hut construction	• site preparation / vegetation clearing • site fencing installed around each substation to restrict unauthorised access • civil works and drainage • foundations • major electrical equipment installation • rehabilitation of disturbed areas not required for operational purposes including clean-up of exposed soils, removal of waste and landscaping.

6.2.2.3 Commissioning and operations

The project would be subject to a detailed testing and commissioning plan and several performance trials to verify the integrity of the transmission lines and substation infrastructure. Following the completion of construction, the project is expected to be commissioned in 3 separate network portions:

(1) Renewable Energy Hub and CopperString Core sections, including the connections to the Chumvale Substation

(2) Southern Connection and Woodya Connection sections

(3) Mount Isa Augmentation section.

The commissioning process for each network portion is anticipated to take up to 2 months.

The design life of the transmission network is expected to be 45 years; however ongoing, regular maintenance would be required throughout its operational life. The EIS indicates that any infrastructure components with a design life of less than 45 years would require replacement to maintain reliability of supply (e.g. transformer oil refurbishment/replacement required every 10 to 20 years).

6.2.2.4 Decommissioning

At the completion of the construction program, all project construction infrastructure and facilities associated with the construction camps, laydown/delivery areas and any onsite works would be dismantled, removed and disposed of or retained as agreed by the landowner and subject to further approvals. As soon as practicable after cleared areas are no longer required, including the reduction in width of access tracks needed for operations, rehabilitation activities would commence.

A Construction Environmental Management Plan (CEMP) would be developed prior to construction commencing which would include rehabilitation measures for areas to be temporarily disturbed during construction with the overall aim of minimising the amount of land disturbed at any one time during the construction of the project.

At the end of transmission network life, all transmission tower infrastructure located above ground level would be removed for recycling or disposal. Tower footings would be cut off between 300 millimetres (mm) to 1 m below ground level dependent of the current use of the land (i.e. 1 m below ground in agricultural land).

6.2.3 Project location

The linear nature of transmission infrastructures means the project corridor traverses a diverse array of geographical and topographical landscapes, which includes the crossing of 6 of the 13 bioregions of Queensland (refer to Figure 6.2). These include the:

- Northwest Highlands bioregion (Mount Isa Inlier subregion)
- Gulf Plains bioregion (Woondoola Plains and the Donors Plateau subregions)
- Mitchell Grass Downs bioregion (Central Downs, Kynuna Plateau and Southwestern Downs subregions)
- Einasleigh Uplands bioregion (Broken River subregion)
- Desert Uplands bioregion (Cape–Campaspe Plains, the Alice Tablelands, and the Prairie–Torrens Creeks Alluvials subregions)
- Brigalow Belt bioregion (Townsville Plains subregion).

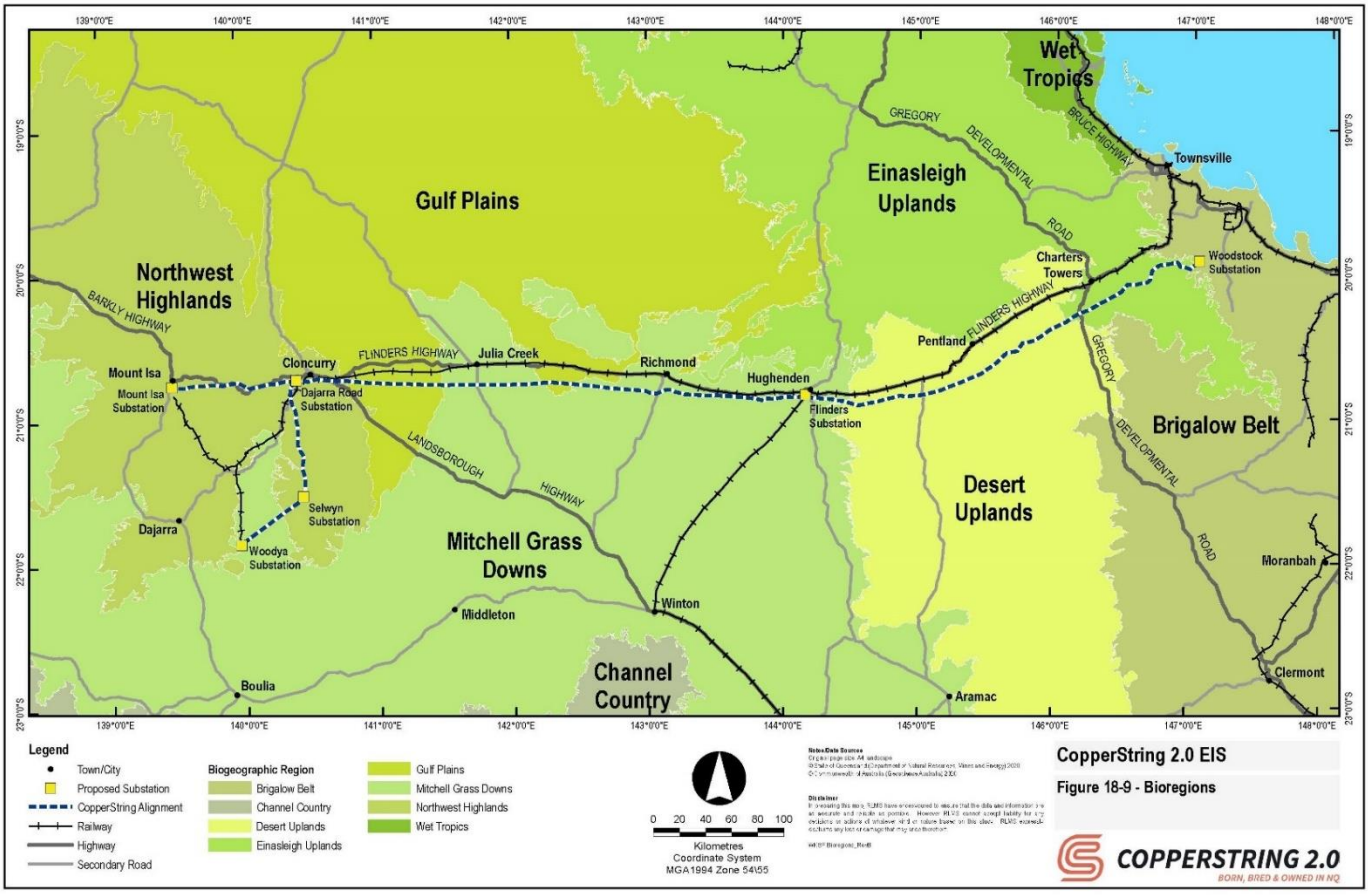

Figure 6.2 Bioregions intersected by the project corridor[48]

The project is also located within 6 major river catchment areas, including the Haughton River, Burdekin River, Copper Creek, Flinders River, Leichhardt River and Georgina River catchments. The Renewable Energy Hub corridor section crosses several higher order waterways and their tributaries including but

[48] From the project EIS, updated Project Description. Updated version provided by proponent for this report.

not limited to, Oaky Creek, Campaspe River, Cape River, Torrens Creek and Prairie Creek within the Haughton River, Burdekin River and Copper Creek catchment areas.

The closest wetland of international importance (Ramsar wetland) is the Bowling Green Bay Ramsar site which is located approximately 40 km-northeast of the project corridor within the Haughton River catchment. This site provides important habitat for conservation significant marine species (e.g. green turtles) and supports Australian waterbird groups and migratory bird species.

Four out of the 6 project corridor sections: the Renewable Energy Hub, CopperString Core, Mount Isa Augmentation and Southern Connection, all sit within the Flinders River catchment which supports ecologically significant springs fed by the Great Artesian Basin that are relatively intact due to low levels of disturbance. The project corridor within this catchment crosses 21 higher order waterways and their tributaries.

The Mount Isa Augmentation section sits within the Leichhardt River catchment, and the Southern Connection and Woodya sections within the Georgina River catchment; however, only the Woodya section crosses any major watercourses within this catchment.

Much of the project corridor lies within relatively uniform open rural landscape dominated by current and historical grazing activities and expansive areas of least concern vegetation. As represented in Figure 6.3, the EIS indicates approximately 98% of the land impacted by the project is used for cattle grazing and associated agricultural practices. These land uses have influenced the type and condition of vegetation across the project corridor to varying extents, with the remaining 2% of land categorised as conservation areas and natural environments.

The first 342 km of the project (Renewable Energy Hub section) would pass through the southern extent of the North Queensland Clean Energy Hub, a renewable energy zone containing both ‘A’ class wind and solar resources.

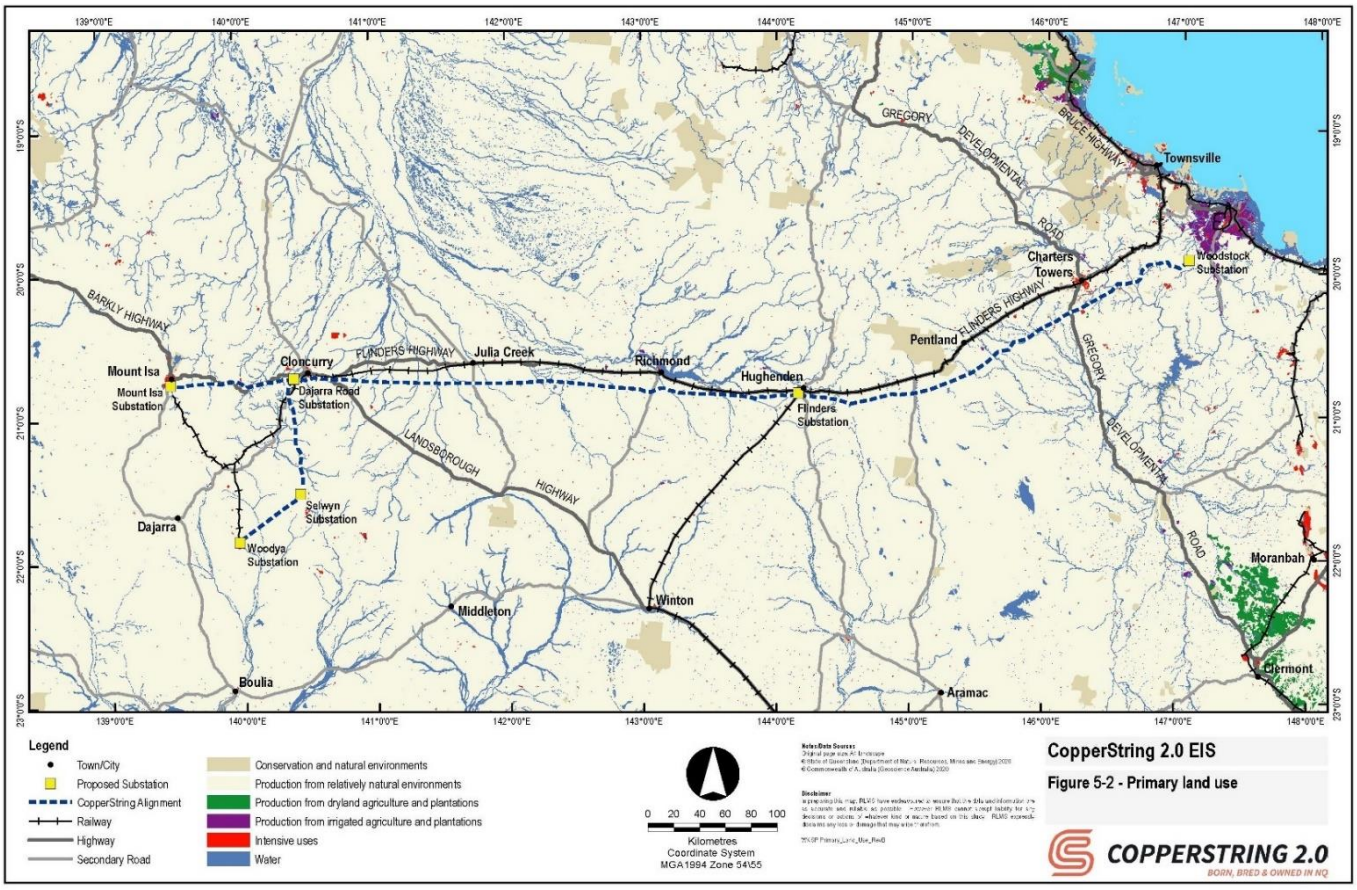

Figure 6.3 Primary land use across the project corridor[49]

The EIS indicates that 124 land parcels would be impacted by the project corridor, including transmission line infrastructure (i.e. transmission towers, substations, CEV huts), access tracks, construction camps and laydown/delivery areas.

Individual landholders along the project corridor include freehold and leased lands in private hands, agricultural companies, state-owned lands and lands under the control of government entities such as the Department of Transport and Main Roads, Ergon or Powerlink. The Southern Connection of the project would traverse the Ballara Nature Refuge (further discussed in section 5.2 of this report) which is subject to a conservation agreement between the landholder and the State.

6.2.4 Avoidance, rehabilitation and offsets

6.2.4.1 Avoidance

6.2.4.1.1 Corridor selection

A Corridor Selection Report was prepared for the project to refine the 5 km wide baseline investigation corridor (also referred to as the 'study area') to a 60 m – 120 m wide transmission corridor (also referred to as the 'project corridor'). The aim of the refinement process was to avoid environmental, social and economic impacts to the greatest extent possible.

The study area was based off the transmission line route identified in the 2010 Route Selection document for the previous CopperString Project, with the 2010 route adopted as a notional centreline

[49] From the project EIS, Chapter 5 - Land. Updated version provided by proponent for this report.

(2.5 km either side of the centreline). The EIS re-visited the methodology for the 2010 Route Selection to reconfirm critical project assumptions and selection criteria considering contemporary information and on-the-ground circumstances.

Following multi-disciplinary reviews, a detailed desktop review and extensive consultation with various stakeholders including government, industry and landowners, 7 major and 38 minor amendments were made to the project corridor to avoid impacts to environmentally sensitive areas, cultural heritage areas, and in regard to landholder requests and engineering considerations. A summary of the study area refinement process is shown below in Figure 6.4.

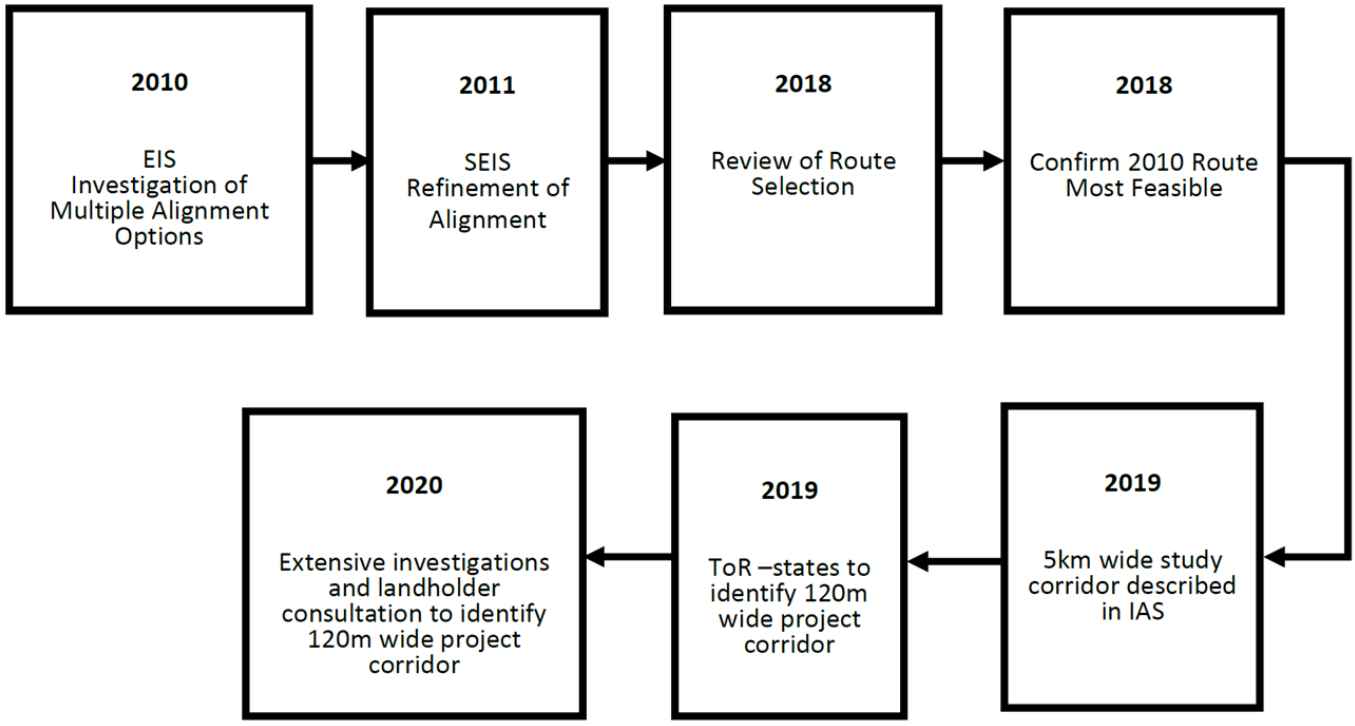

Figure 6.4 Corridor refinement process[50]

6.2.4.1.2 Concept design

The concept design forms the basis of the EIS assessment and considers the project ’s construction and operational activities and design footprints with reference to the landscape context, dimension, area, extent, duration, and ability for temporary disturbances or permanent infrastructure to successfully rehabilitate or integrate with the surrounding natural environment.

As part of the concept design, tower siting plans were developed for the EIS to locate transmission towers, model tower heights and consider span lengths with regard to:

- vegetation canopy heights and ground elevations
- physical constraints (i.e. existing land use)
- avoidance of ecological constraints (i.e. riparian corridors including the bed and banks of waterways) and known locations of conservation significant flora species.

[50] From the project EIS, Appendix D – Corridor selection report.

Based on the information presented in the EIS, the concept transmission tower sites were identified to make best use of the terrain to provide sound foundations while minimising impacts to the environment and adjacent land uses. An example of a tower siting plan is shown at Figure 6.5.

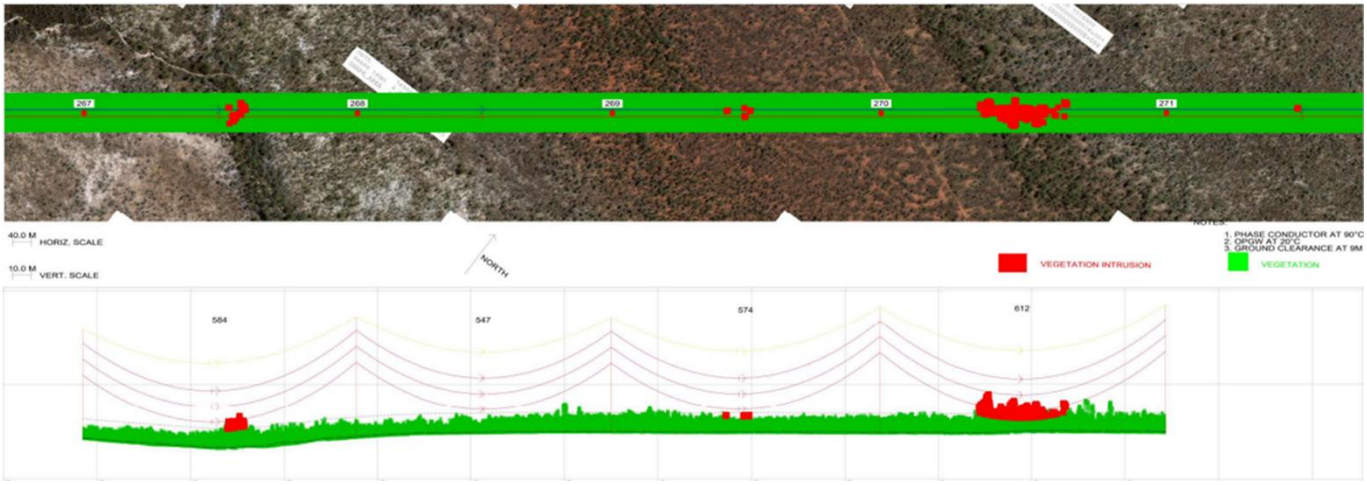

Figure 6.5 Tower siting plan example[51]

6.2.4.1.3 Micro-siting

The EIS considered that further opportunity for avoidance and minimisation of impact to environmental values would be achieved through the siting and final configuration (also referred to as 'micro-siting') of temporary construction activities and operational infrastructure, in particular transmission towers (tower location, type, height, and foundation). The proponent has committed to undertake micro-siting as part of the detailed design phase of the project and prior to commencement of construction.

The micro-siting process would be informed by targeted pre-clearance surveys which would deliver ground-truthed information on specific ecological values such as habitat quality and condition, presence of breeding places, gilgais, ground cover and density of canopy cover. An example of how micro-siting may influence design optimisations and a reduction to the development footprint is shown in Figure 6.6, comparing potential layout options for a tower assembly area, in consideration of local features.

[51] From the project EIS, Volume 4, Attachment C.

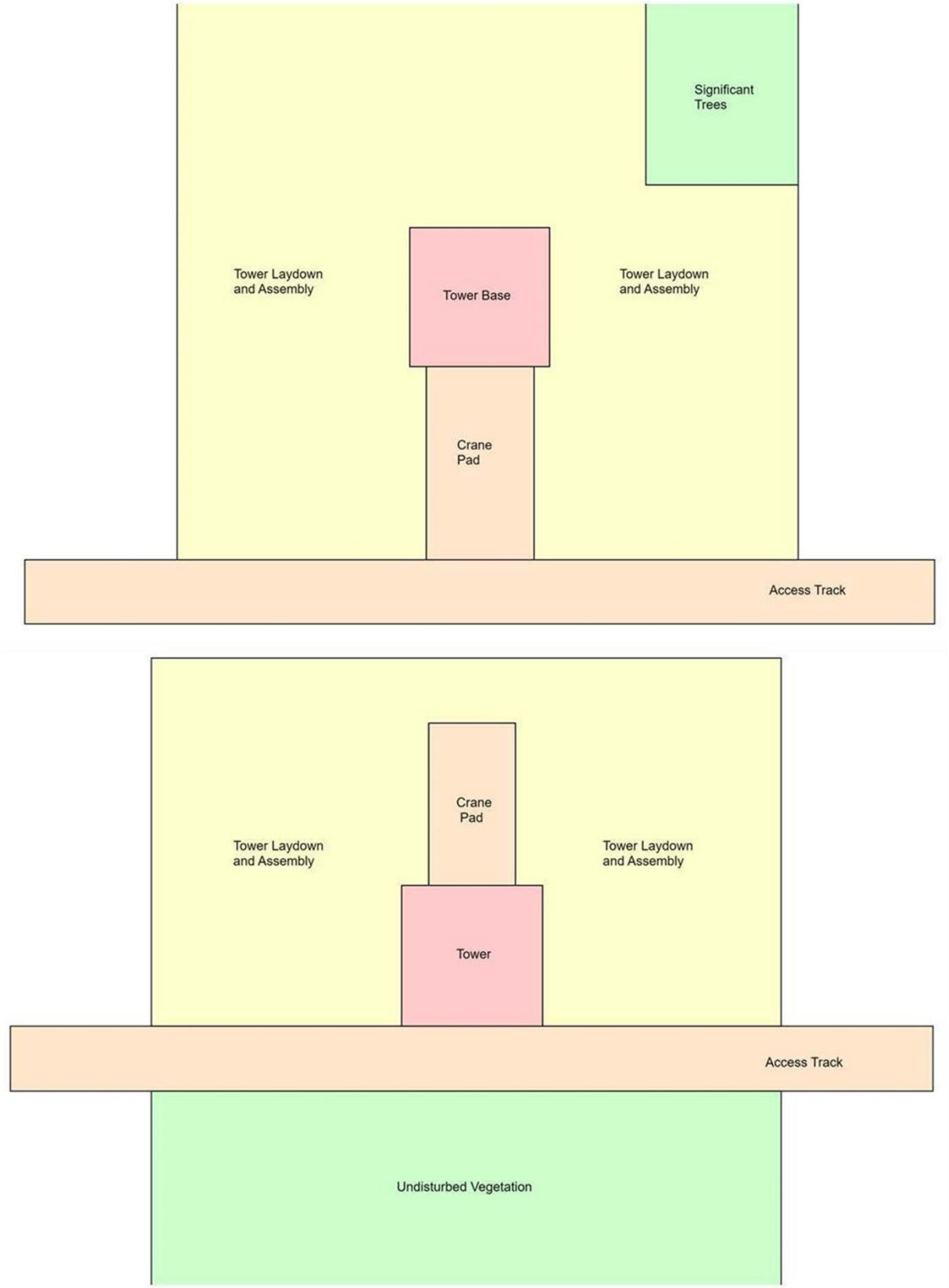

Figure 6.6 Tower assembly area layout options[52]

[52] Provided by the proponent during the evaluation of the Project EIS.

Micro-siting is defined in information provided by the proponent during evaluation of the EIS and is further described in Appendix 5 of this report.

A Field Development Plan (FDP) and clearing analysis plans have also been developed for the project to define a process to further refine the concept design during the detailed design phase. The plans include design specifications and recommendations that will be used during detailed design and construction phases.

6.2.4.2 Rehabilitation

The extent and type of disturbance to habitat associated with vegetation clearing and subsequent rehabilitation requirements will vary across the project corridor. Some areas may require large mature trees to be pushed resulting in ripping soils, scraping of ground top soils and/or compaction of soils while others may not trigger any disturbance treatment or only minor grass slashing or pruning to enable construction works.

Where considered necessary and as soon as practicable following disturbance, the proponent would progressively rehabilitate disturbed areas not required for permanent infrastructure and operations. The EIS indicates consideration of the timing of progressive rehabilitation would be given to promote natural regeneration of disturbed areas, maximise potential of existing seed banks and minimise potential for erosion.

A Concept Rehabilitation Plan for the project was provided in the EIS,[53] detailing the overarching rehabilitation goals, objectives, performance criteria and completion criteria for the land temporarily cleared for project construction works and not required for use during operation. The overarching rehabilitation goal for the project is to return disturbed areas as close as practicable to pre-disturbed conditions.

The Concept Rehabilitation Plan states specific rehabilitation objectives, performance indicators and measurable targets would be developed for site and stage-specific rehabilitation sub-plans as required and would take into consideration detailed design, staging of works, local environmental and landholder requirements and relevant conditions of approvals.

6.2.4.3 Biodiversity offset management strategy

Since acceptance of the final EIS, the proponent has prepared an updated draft biodiversity offset management strategy (BOMS) for the project, which identifies 8 properties as potential biodiversity offset sites for the project (refer to Figure 6.7). The proposed offset properties occur across the Brigalow Belt, Einasleigh Uplands, Gulf Plains, Mitchell Grass Downs and Desert Uplands bioregions with a total combined area of approximately 680,000 ha.

The proponent proposes a staged offset approach in light of the staged land clearance for the project, to occur across the 9 construction hubs. Updated significant residual impact (SRI) areas for each stage of construction, within the maximum SRI areas discussed in this report, would be confirmed post pre-clearance surveys and during detailed design, prior to commencement of clearing for the relevant stage. The actual SRI would then be confirmed by a post-construction audit. Recommended conditions are provided in this report (Appendix 3) for consideration by the Commonwealth Minister for the Environment which would require the proponent to report on updated SRI area estimates prior to commencement of construction, and report on actual SRIs and detailed offset delivery mechanisms following a post-construction audit.

[53] EIS Volume 3, Appendix T available at: **https://eisdocs.dsdip.qld.gov.au/CopperString/2019/dEIS/Volume-3-AppendixT-Concept-rehabilitation-plan.pdf**.

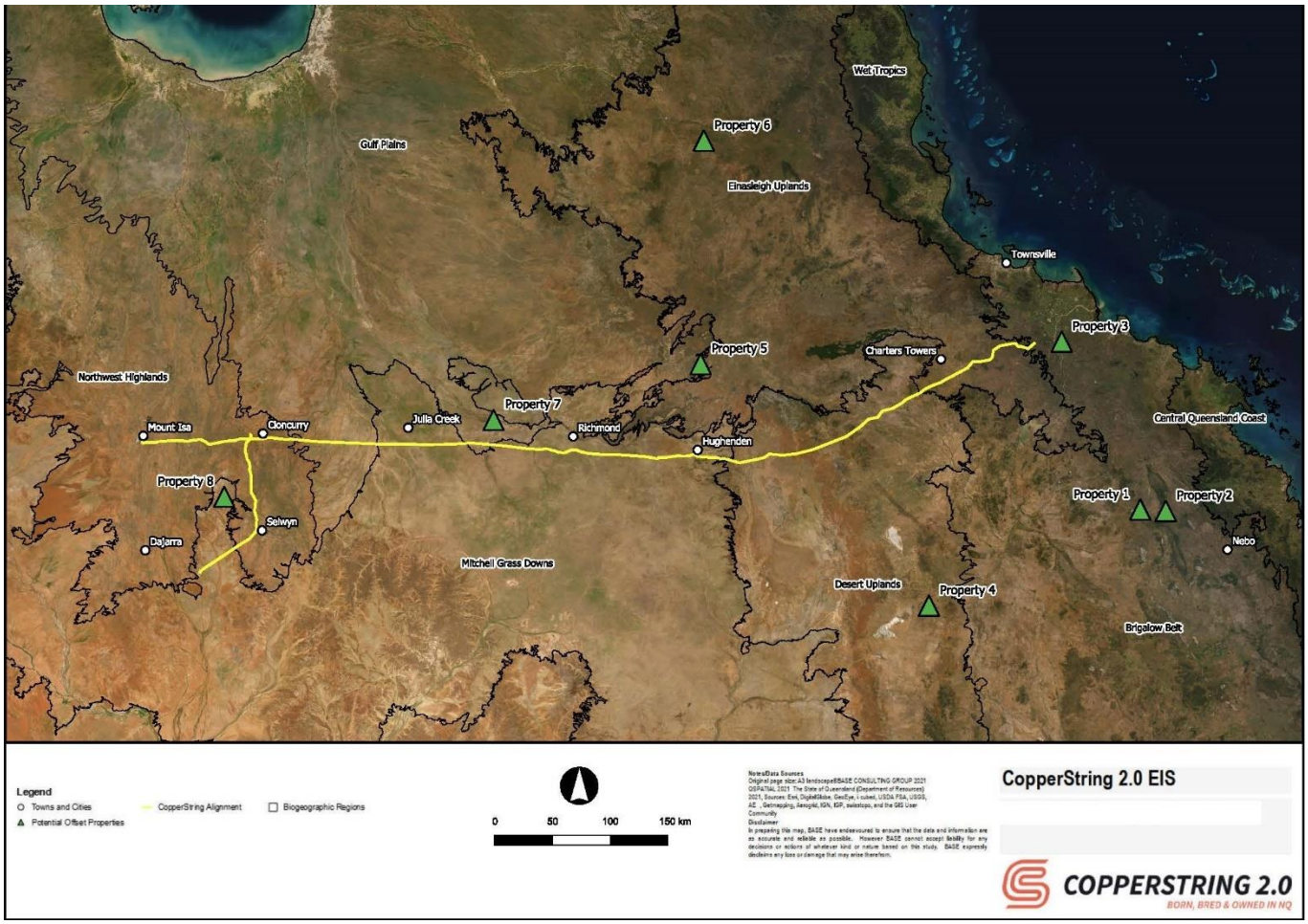

Figure 6.7 Potential biodiversity offset properties[54]

6.2.5 Submissions

The key issues regarding MNES impacts raised in submissions on the EIS include the following:

- the need for development of an environment offset strategy
- uncertainty on the extent of rehabilitation works proposed / rehabilitation of cleared areas
- potential for introduction of highly invasive pest and weed species along the project corridor, such as non-native grader grass and/or thatch grass not palatable to livestock
- management measures for disposal of cleared weeds
- potential mortality of bird species (i.e. night parrot) from direct strike with construction and maintenance vehicles and direct collision with transmission infrastructure, and the need for monitoring of species mortality
- the requirement to better define species presence and areas of native vegetation clearing along the project corridor following detailed design.

This report has considered each submission received and the responses provided by the proponent in evaluation of the project. Assessment of key matters is provided below.

[54] From the project EIS, updated in the draft biodiversity offset management strategy dated 2 August 2022.

6.3 Ecologically sustainable development

As defined in Part 1, section 3A of the EPBC Act, the principles of ecologically sustainable development are:

- the integration principle: decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations
- the precautionary principle: if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation
- the intergenerational principle: the present generation should ensure that the health diversity and productivity of the environment is maintained or enhanced for the benefit of future generations
- the biodiversity principle: the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making
- the valuation principle: improved valuation, pricing and incentive mechanisms should be promoted.

This report has considered the above principles in evaluation of project impacts.

This report is the culmination of an environmental impact assessment process addressing economic, environmental, social and equitable considerations which included a public consultation process and the consideration of submissions lodged by the public, private organisations and government agencies.

All long-and short-term impacts on MNES for the project would be managed through the recommended conditions set for the Commonwealth Minister for the Environment (Appendix 3). This report has adopted a precautionary approach and support for the biodiversity principle by including a condition requiring offsets for MNES which would supplement the proponent's management and impact mitigation measures.

A public comment period enabled the submitters to raise issues about the project in a fair and equitable manner. This evaluation of the project has considered these issues to ensure the interests of all stakeholders were considered and the intergenerational principle was applied.

This report considers that the adoption of a comprehensive set of recommended conditions for the project (Appendix 3) would allow for the project to be constructed, operated, rehabilitated and decommissioned in a sustainable manner, having regard to potential environmental risks to protect MNES and the protection of the environment for future generations.

This report is satisfied that potential impacts of the project would be suitably compensated through the provision of offset areas in respect of areas disturbed by the project.

6.4 Listed threatened species and communities

In deciding whether or not to approve the proposal for the purposes of a subsection of section 18 or section 18A of the EPBC Act, and what conditions (if any) to attach to such an approval, the Commonwealth Minister for the Environment must not act inconsistently with Australia's obligations under:

- the Convention on Biological Diversity
- the Convention on Conservation of Nature in the South Pacific (Apia Convention)
- the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

- a recovery plan or threat abatement plan (TAP) for threatened species.

The Commonwealth Minister for the Environment must also, in deciding whether to approve the taking of the action, have regard to any approved conservation advice for the threatened species or ecological community that are likely to be or would be significantly impacted by the project.

This section assesses the project against the objectives and priority actions of conservation advice, recovery plans and TAPs for the relevant threatened species and communities. The SRI of the project on threatened fauna are also considered in this section.

For the EIS assessment, a search of the EPBC Act protected matters search tool (PMST) was utilised to provide an indication of the threatened species and communities which may occur within and surrounding the project study area. This was then ground-truthed during surveys undertaken for the EIS assessment. The adequacy of the surveys undertaken for each species was checked against relevant EPBC Act survey guidelines.

The proponent was required to complete comprehensive field surveys to confirm the occurrence of MNES including threatened species. This report notes that agencies with an interest in biodiversity (including the Commonwealth Department of Climate Change, Energy, the Environment and Water [DCCEEW]) generally agreed that the survey effort undertaken by the proponent for listed threatened species was adequate for the purposes of assessment at this stage of project development.

6.4.1 Methodology of assessment – overview

6.4.1.1 Desktop assessment

The EIS reviewed the ecological assessments undertaken as part of the previous CopperString EIS process, including survey efforts, to generate predictive habitat mapping to inform targeted selection of survey sites. These ecological assessments were also used by the proponent to determine localised route alignments for the project to avoid previously identified areas of ecological significance. The corridor selection process is discussed further in section 6.2.4.1 above.

The desktop assessment also included searches of Australian and Queensland government databases for records of relevant environmental values within the study area, including but not limited to:[55]

- EPBC Act 1999 Protected Matters Search Tool (Australian Government)
- Wildlife Online database (Queensland Government)
- Atlas of Living Australia (Australian Government)
- WildNet database (Queensland Government)
- Flora Survey Trigger Mapping (Queensland Government)
- Regulation Vegetation Management Map (Queensland Government)
- Regional Ecosystem Description Database (Queensland Government)
- Broad Vegetation Group Map (Queensland Government)
- Essential Habitat Map, version 7.2 (Queensland Government).

[55] Refer to Volume 4, Attachment E Revised Information MNES, section 18.3.4 for full list of government databases searched.

6.4.1.2 Field assessment

Field surveys conducted within the study area for the project were undertaken between September 2019 and May 2021 and were timed to account for seasonal variation in ecological assemblages.

In total, the survey effort equates to 88 field days spread across the entire project corridor. This is comprised of 736 flora sites, 454 fauna/habitat sites and 64 aquatic sites over 30 days pre-wet season and 103 flora sites, 177 fauna/habitat sites and 19 aquatic sites over 58 days post-wet season.

These survey sites were selected following and informed by the desktop assessment, and targeted areas of high ecological value and those areas not surveyed as part of the previous CopperString EIS process due to land access or logistical constraints.

Habitat features recorded during the field assessment to document the value of habitats included:

- structure and complexity of vegetation at canopy, shrub, and ground layers
- substrate type and structural complexity of ground level microhabitats
- presence of refuges and resources such as fallen timber, hollow-bearing trees, leaf litter, nests, waterbodies, boulder piles and outcrops
- habitat condition based on existing land use and associated disturbance due to vegetation clearing, fragmentation, grazing, fire, weeds and pest infestation
- presence and condition of key resources for targeted conversation significant species.

6.4.1.3 Occurrence of MNES

6.4.1.3.1 Likelihood of occurrence

A likelihood of occurrence assessment for flora and fauna species of conservation significance was undertaken for the EIS. It considered factors including species habitat preferences, known distribution, previous records from the region, occurrence of habitat in the study area and field observations. Species were then categorised as either ‘unlikely to occur’, ‘may occur’, ‘likely to occur’ or ‘confirmed present’, as follows:

- species considered ‘unlikely to occur’ had either not been recorded in the region, the study area was outside their known distribution, or suitable habitat was unavailable in the study area
- species that ‘may occur’ had not previously been recorded in the region but the study area contains marginal suitable habitat and was within the known species distribution range
- species determined ‘likely to occur’ had previously been recorded in the region and suitable habitat is present in the study area
- species listed as ‘confirmed present’ are those that were recorded in the field surveys undertaken in the study area for the EIS assessment.

6.4.1.3.2 Predictive habitat modelling and suitable habitat mapping

Predictive modelling was undertaken to identify areas that support or likely to support habitat for species protected under the EPBC Act or the Queensland *Nature Conservation Act 1992* (NC Act) in the study area. The modelling was initially used to recognise habitat requirements for conservation significant species identified by the desktop analysis and species ‘confirmed present’ or considered ‘likely to occur’ for the previous CopperString EIS process, to inform targeted selection of survey sites.

Following field assessments and to identify suitable habitat for threatened species and communities that have been 'confirmed present' or considered as 'likely to occur' based on the desktop assessment and field data, predictive habitat mapping was refined taking into consideration the:

- essential habitat factors (Queensland Government)
- known distribution
- preferred habitat characteristics of each species from the SPRAT database

The EIS assessment considered the relevance of suitable habitat for each threatened species to their habitat requirement (i.e. breeding, non-breeding or foraging habitat), movements and lifecycle and the remaining suitable habitat at local (within 2.5 km) and regional (within 10 km) scales.

6.4.1.4 Adverse impact assessment

To assess the nature and extent of an impact on threatened species and communities protected under the EPBC Act and NC Act either 'confirmed present' or 'considered likely to occur' within the study area and to determine whether the impact is adverse or significant, the EIS utilised a concept design (as discussed in section 6.2.4 above).

The EIS stated that the final siting and configuration of project components including conductor size, transmission tower structure type, height and size and tower foundations would not be confirmed until detailed design is complete. As such, this report acknowledges that detailed design may offer significant opportunities for optimisation and reduction in disturbance footprints (e.g. increase in the distance between transmission towers); however the current concept design provides for a reliable, precautionary quantification of predicted impacts.

To increase certainty of predicted impacts based on the concept design, the EIS considered the following across the project corridor:

- mapped landscape types based on broad vegetation groups:
  - low open woodland to wooded spinifex grassland (eucalypt/acacia dominated) on slopes, crests and scarps
  - mixed low woodland with spinifex (gidgee/mulga/eucalypt dominated) on plains
  - open forest to open woodland (eucalypt/melaleuca/belah dominated) on flat to undulating plains
  - cleared grazing land with scattered trees
  - riparian zone and fringing vegetation along ephemeral channels, watercourses and channelised floodplains
  - tussock/hummock grassland
- tree density data to identify the type of clearing required (very light, light, medium or heavy) and allow an accurate estimate of vegetation along the project corridor
- canopy height data to derive the percentage of canopy cover that has vegetation greater than 3.5 m in height within the conductor clearance zones that may require clearing, cutting, or trimming (as shown in Figure 6.5)
- the type and duration of the disturbance (temporary or permanent) for each construction and operation project activity as detailed in Table 6.2.
- construction methodology (i.e. the basis of the stringing construction methodology is for stringing to be undertaken by helicopters which requires a 6 m wide area to be cleared to ground level directly underneath the transmission line).

Table 6.2 Description of project construction and operation activities

Temporary project activity description- Construction		Permanent project activity description- Operation	
Access tracks	• 6 m wide unsealed track generally contained within the project corridor • Suitable for dry weather use for 4WDs at low speed • Vegetation cleared to ground level including root stock • Rehabilitated consistent with surrounding grassland cover	Access tracks	• 3 m wide unsealed track generally contained within the project corridor • Suitable for dry weather use for 4WDs at low speed • Vegetation cleared to ground level including root stock • No active rehabilitation proposed
Brake and winch sites	• Tensioning of transmission lines required every 5 km to 10 km along the project corridor • Between 0.16 ha and 0.24 ha per site • Vegetation cleared to ground level including root stock • Rehabilitated to state generally consistent with the natural environment	Tower pads	• Extends 6 m in all directions around the transmission tower base • Approximately 0.084 ha per site • Vegetation cleared to ground level including root stock and earth graded and rolled • No active rehabilitation proposed
Tower assembly areas	• Approximately 0.33 ha per site • Vegetation cleared to ground level including root stock • Rehabilitated to state generally consistent with the natural environment	CEV Huts	• Between 0.48 ha and 0.7 ha per site • Security fenced to restrict unauthorised access • Vegetation cleared to ground level including root stock • No active rehabilitation proposed
Laydown/ delivery areas Construction camps	• Laydown/delivery areas would be located at either camps or substations • Laydown/delivery areas would be approximately 6.25 ha in size for the construction areas associated with the transmission line, and 25 ha in size for each substation • Construction camp areas • Vegetation cleared to ground level including root stock • Rehabilitated to state generally consistent with the natural environment	Substations	• Between 1 ha and 40 ha per construction footprint and 0.6 ha and 15 ha per infrastructure footprint • Security fenced to restrict unauthorised access • Vegetation cleared to ground level including root stock • No active rehabilitation proposed
Transmission line clearing (below 1 m) (line of sight)	• 6 m wide area directly below the transmission lines along the project corridor • Required for wire stringing by helicopter, energisation, allow for cable movement and to minimise future vegetation growth	Transmission line clearing (conductor clearance zone – above 3.5 m)	• Ensures acceptable clearances are maintained between electrical infrastructure and vegetation for safety • Clearing or trimming of vegetation over 3.5 m in height within the conductor clearance zone

Temporary project activity description- Construction		Permanent project activity description- Operation	
	• Vegetation cleared to ground level • Rehabilitated consistent with surrounding grassland cover • Natural regeneration of vegetation allowed up to a height of 3.5 m		• Vegetation cut-back at a 45 degree angle from tower footing extending beyond easement

6.4.2 Threatened ecological communities

An ecological community is a naturally occurring group of plants, animals and other organisms that are interacting in a unique habitat. Its structure, composition and distribution are determined by environmental factors such as soil type, position in the landscape, altitude, climate and water availability. An ecological community becomes threatened when it is at risk of extinction.

A search of the PMST identified only one threatened ecological community (TEC) listed as 'endangered' under the EPBC Act with the potential to occur within and surrounding the study area, being Community of native species dependent on natural discharge of groundwater from the Great Artesian Basin (GAB).

The EIS found that no mapped or recorded regional ecosystems (RE) (2.3.39, 4.3.22, 5.3.23, 6.3.23, 10.3.31 and 11.3.22) corresponding with this TEC are located within 5 km of the project corridor. The closest active discharge spring in the GAB is located approximately 50 km north.

Whilst not identified in a PMST search, the previous survey work undertaken in 2010/2011 for the previous CopperString EIS process identified the Semi-evergreen vine thickets (SEVT) of the Brigalow Belt (North and South) and Nandewar Bioregions TEC within the study area. The SEVT TEC is listed as endangered under the EPBC Act.

The project has been designed to avoid several patches of the SEVT TEC, such that the closest SEVT TEC patch is located approximately 1 km from the project corridor (as shown in Figure 6.8).

This report concludes that any potential direct or indirect impacts to the SEVT TECs would be avoided through corridor selection and the distance between construction and operational activities and the SEVT TEC.

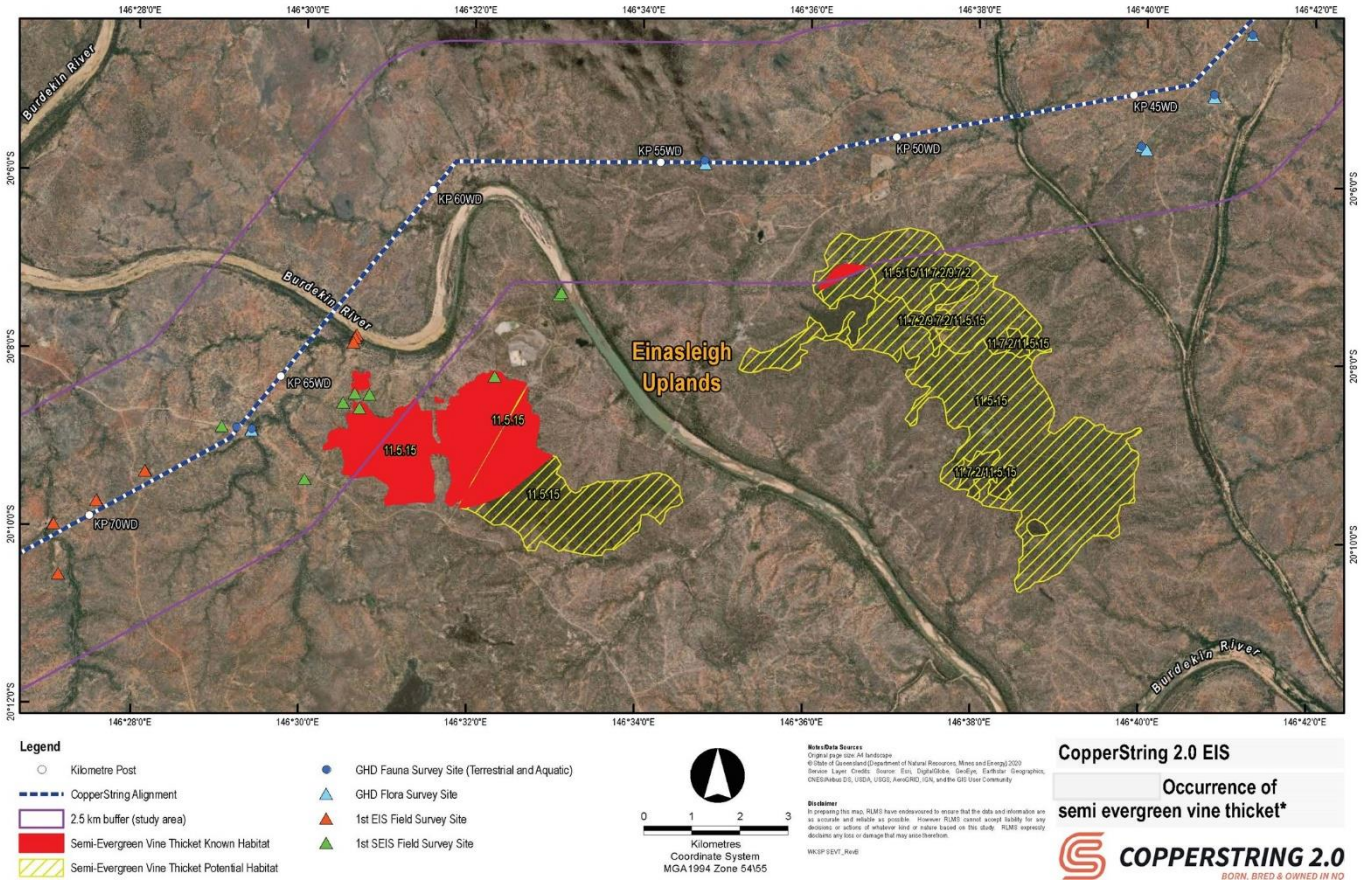

Figure 6.8 Avoidance of TEC through corridor selection[56]

6.4.3 Threatened flora

A desktop search, including PMST and Wildlife Online databases, identified 9 threatened flora species with the potential to occur within the study area and surrounds (up to 2.5 km either side of the study area). The *Terms of Reference for an environmental impact statement: CopperString project* [57] also required consideration of 2 additional listed threatened flora species not identified in the desktop Surveys for listed threatened flora species were undertaken by the proponent in accordance with the Queensland *Flora Survey Guidelines – Protected Plants*.[58] Flora ground surveys were conducted during 8 periods at:

- 110 flora sites in September 2019
- 123 flora sites in December 2019
- 75 flora sites in September 2020
- 60 flora sites within the Ballara Nature Refuge in October 2020
- 284 flora sites between October and November 2020
- 84 flora sites in January 2021
- 46 flora sites in March 2021
- 57 flora sites in May 2021.

[56] From the project EIS, Chapter 18. Updated version provided by proponent for this report
[57] https://eisdocs.dsdip.qld.gov.au/CopperString/2019/Final%20terms%20of%20reference/copperstring-final-terms-of-reference.pdf
[58] Queensland Government, Flora Survey Guidelines – Protected Plants, Department of Environment and Science, 2020, Viewed May 2022, https://www.qld.gov.au/__data/assets/pdf_file/0028/99901/gl-wl-pp-flora-survey.pdf.

An assessment of the likelihood of occurrence for each flora species determined 2 species were recorded during field surveys and 'confirmed present', one species was considered 'likely to occur' with mapped potential habitat identified within the project corridor and the remaining 8 species were considered to either 'may occur' or 'unlikely to occur', as outlined in Table 6.3.

The EIS presented the view that SRI are unlikely for those threatened species not identified during surveys and considered only to 'may occur' or 'unlikely to occur' with the project corridor. The lack of historical species records combined with the survey effort undertaken by the proponent indicated that the project corridor is unlikely to support populations of these threatened species. This report accepts this finding based on the evidence presented in the EIS.

Only the 3 threatened species identified as either 'confirmed present' or considered 'likely to occur' were further assessed in the EIS.

Table 6.3 EPBC Act listed threatened flora species

Scientific name	Common name	EPBC Act status	Likelihood of occurrence
Acacia crombiei	Pink gidgee	Vulnerable	**Likely to occur**
Aristida granitica	-	Endangered	Unlikely to occur
Bulbophyllum globuliforme	Miniature moss-orchid	Vulnerable	Unlikely to occur
Dichanthium setosum	Bluegrass	Vulnerable	May occur
Eucalyptus raveretiana	Black ironbox	Vulnerable	**Confirmed present**
Leichhardtia brevifolia	-	Vulnerable	Unlikely to occur
Livistona lanuginosa	Waxy cabbage palm	Vulnerable	**Confirmed present**
Omphalea celata	-	Vulnerable	Unlikely to occur
Tephrosia leveillei	-	Vulnerable	Unlikely to occur
Eucalyptus paedoglauc	Mount Stuart ironbark	Vulnerable	May occur
Dichanthium queenslandicum	King blue-grass	Endangered	Unlikely to occur

6.4.3.1 Pink gidgee (*Acacia crombiei*)

6.4.3.1.1 Background

The pink gidgee is listed as 'vulnerable' under the EPBC Act. The species is endemic to Queensland and occurs in small, isolated populations in Central Queensland, mostly within an area 100 km south and 150 km north-west of Hughenden. The species occurs on wooded downs in woodland and open woodland often associated with gidgee and whitewood, on alluvial, sandstone and basalt derived soils. Its distribution is known to overlap with the Community of native species dependent on natural discharge of groundwater from the GAB TEC (considered in section 6.4.2 above).

The EIS identified that the known distribution of species consists of 15 subpopulations, all located outside of the study area.

Pink gidgee was not recorded within the study area during field surveys undertaken as part of the EIS assessment, however suitable habitat has been mapped within the Renewable Energy Hub and CopperString Core sections within RE polygons containing all or some of the REs; 4.3.3, 4.3.4, 4.3.8, 4.3.14, 4.3.19, 4.3.20, 4.3.23, 4.9.1, 4.9.7, 4.9.8, 4.9.11, 9.8.5, 9.8.6, 9.8.7, 9.10.4, 9.12.18, 10.3.15, and 10.4.5.

6.4.3.1.2 Recovery plans, conservation advice and threat abatement

There are no threat abatement or recovery plans relevant to this species. The species has an approved conservation advice: The species has an approved conservation advice: *Approved Conservation Advice for Acacia crombiei (Pink gidgee)*[59] which identifies the key threats to the species as habitat loss, disturbance and modification.

Priority recovery and threat abatement actions for the pink gidgee in the conservation advice that are relevant to the project include:

- minimising adverse impacts from land use at known sites
- undertaking appropriate seed collection and storage
- linking, enhancing or establishing additional populations
- implementing national translocation protocols where establishing additional populations is considered necessary and feasible.

6.4.3.1.3 Impacts and mitigation

Direct removal of habitat

The EIS estimates that the construction and operation of the project would result in the clearance and/or disturbance of approximately 219.41 ha (143.39 ha for construction and 76.02 ha for operation) of suitable pink gidgee habitat. While not recorded during field surveys for the EIS, the proponent has committed that any previously undetected individuals would be identified through pre-clearance surveys and impacts avoided or minimised where possible.

If individual occurrences are identified in pre-clearance surveys, the proponent has committed to, through detailed design and micro-siting, span across lower-height individual trees (typically less than 10 m) and avoid the removal of surrounding open woodland areas using higher transmission towers (i.e. up to 75 m) and adjusted span distances. The EIS indicated that this would allow vegetation below 20 m to be retained and any mature trees over 20 m trimmed for safety and maintenance requirements only, and therefore anticipates no individual specimens would be impacted by the project.

This report acknowledges that where mapped suitable habitat cannot be avoided through design considerations, the proponent has identified through the Framework Environmental Management Plan (Framework EMP) that transmission towers and associated infrastructure would, where possible, be sited in either previously disturbed areas or in locations with the least likelihood to result in adverse impacts.

This report considers the clearance/disturbance area of 219.41 ha to be the maximum impact scenario which would likely be reduced where avoidance measures committed to by the proponent are implemented. This report therefore agrees that the loss of individuals of this species (if any) is unlikely to result in an SRI on this species.

This report includes recommendations for the Commonwealth Minister for the Environment to condition the proponent to undertake a pre-clearance survey to determine the actual number of individual trees (if any) that would be impacted and use the results of that survey to inform the offset requirement for the species.

---

[59] Commonwealth of Australia, *Approved Conservation Advice for Acacia crombiei (Pink gidgee)*, Threatened Species Scientific Committee, Department of the Environment, Water, Heritage and the Arts, Canberra, 2008, viewed 28 April 2022, **http://www.environment.gov.au/biodiversity/threatened/species/pubs/10927-conservation-advice.pdf**.

Increased occurrence of weeds

Prickly acacia, parkinsonia and buffel grass were all recorded within the study area and could contribute to the degradation of suitable habitat for the pink gidgee.[60] The prickly acacia and parkinsonia are both Category 3 restricted matters under the Queensland *Biosecurity Act 2014* and landowners have a 'general biosecurity obligation' to take all reasonable and practical steps to minimise the risks associated with invasive plants on a person's land.

The proponent has committed to the preparation and implementation of site and stage-specific biosecurity management plans as part of the CEMP prior to the commencement of construction which will include species-specific weed prevention, management and monitoring measures to control invasive weed species. The proponent is expected to consult with the relevant local government and landholder/s during the development of biosecurity management plans for the project.

As outlined in the concept biosecurity plan for the project,[61] the proponent will undertake post rehabilitation monitoring and reporting of temporary project activity construction areas (temporary construction areas) on a monthly basis for a minimum period of 2 years to confirm temporary construction areas have been successfully rehabilitated and no longer require ongoing weed management. If ongoing weed infestations are reported, the proponent has identified through the Framework EMP that any infestations would be removed and disposed of appropriately and a review of the existing weed control procedures would be undertaken.

The proponent's commitments to implement weed management measures are appropriate to maintain suitable pink gidgee habitat.

6.4.3.1.4 Significant residual impacts and offsets

The EIS estimates that there is approximately 658.6 ha of suitable pink gidgee habitat within the project corridor. This habitat has not been considered to be habitat critical to the survival of the species due to the lack of species presence. The proponent has committed to undertaking pre-clearance surveys to identify the presence of pink gidgee in areas to be cleared.

Based on the EIS assessment, it is considered that the potential clearance of up to 219.41 ha of suitable pink gidgee habitat would not result in an SRI, noting that no individuals of this species have been identified in field surveys, any undetected individuals would be avoided, and appropriate weed management would occur over the lifetime of the project.

Recommended conditions are included in this report to the Commonwealth Minister for the Environment requiring the proponent to undertake a pre-clearance survey to confirm the presence of the species and to avoid these occurrences to ensure no significant impact to the species. Where an SRI is determined to be likely for the species, a biodiversity offset would be required under the EPBC Act.

6.4.3.2 Black ironbox (*Eucalyptus raveretiana*)

6.4.3.2.1 Background

The black ironbox is listed as 'vulnerable' under the EPBC Act. The species has a wide distribution in central coastal and sub-coastal areas of Queensland, from south of Townsville to Nebo, around Rockhampton and areas 100 km west of that city. The species usually occurs along the banks of rivers, creeks and other watercourses, and sometimes on river flats or open woodland and its distribution is known to overlap with the SEVT TEC (considered in section 6.4.2 above).

[60] Prickly acacia and Parkinsonia are Identified as Weeds of National Significance
[61] EIS Volume 3, Appendix U – Concept biosecurity plan.

The survey effort undertaken as part of the EIS assessment recorded 11 individuals within approximately 85 m of the project corridor along Oaky Creek, with one individual being impacted by a rubber vine infestation.

Two populations of black ironbox were also recorded during plot surveys undertaken in 2010/2011 for the previous CopperString EIS process. This included 7 specimens along the western bank of the Burdekin River crossing and 38 specimens along the western bank at Oaky Creek. Habitats observed in previous survey efforts were heavily degraded by rubber vine and chinese apple infestations at Kirk River and Pandanus Creek crossings.

The EIS mapped suitable habitat for the species based on both the current EIS and previous EIS survey effort and species habitat preferences, using RE polygons that contain REs 9.3.1, 8.3.3 and 11.3.25 (as mixed or single RE polygons) only along watercourses that are of stream order 4 or higher. The EIS considered suitable habitat for the species to only occur within the eastern extent of the Renewable Energy Hub section.

6.4.3.2.2 Recovery plans, conservation advice and threat abatement

There are no threat abatement or recovery plans relevant to this species. The species has an approved conservation advice: *Approved Conservation Advice for Eucalyptus raveretiana (Black Ironbox)*[62] which identifies the key threats to the species as habitat disturbance, smothering by rubber vine, and increased fire frequency from fuel associated with weeds.

Priority recovery and threat abatement actions for the black ironbox in the conservation advice that are relevant to the project include:

- minimising adverse impacts from land use at known sites
- identifying and removing weeds (especially rubber vine) and managing sites to prevent introduction of invasive weeds
- developing and implementing a suitable fire management strategy
- undertaking appropriate seed collection and storage
- linking, enhancing or establishing additional populations
- implementing national translocation protocols where establishing additional populations is considered necessary and feasible.

6.4.3.2.3 Impacts and mitigation

Direct removal of habitat

The EIS estimates that the construction and operation of the project would result in the clearance and/or disturbance of approximately 2.95 ha (1.53 ha for construction and 1.42 ha for operation) of suitable black ironbox habitat. Occurrences of black ironbox within the project corridor have been considered in the EIS as potential 'important' habitat due to their location near the north-western limit of the species range within a sub-population.

Due to the concentrated location of the species within the riparian corridor of selected waterways, specifically Oaky Creek and the Burdekin River, the EIS states that through pre-clearance surveys and

[62] Commonwealth of Australia, *Approved Conservation Advice for Eucalyptus raveretiana (Black Ironbox)*, Threatened Species Scientific Committee, Department of the Environment, Water, Heritage and the Arts, Canberra, 2008, viewed 28 April 2022, **http://www.environment.gov.au/biodiversity/threatened/species/pubs/16344-conservation-advice.pdf**.

subsequent detailed design, transmission towers and associated infrastructure would be sited to span across lower-height trees and/or avoid any removal of individuals of this species.

Where mature trees are greater than 20 m in height and within 5 m of the transmission line at maximum sag where the species may meet with the electrical infrastructure, periodical maintenance trimming of individual specimens would be required throughout the life of the project. The proponent proposes to undertake trimming outside of the flowering and fruiting period to prevent any disruption to species reproduction, which is expected to be reflected in the Operational Environmental Management Plan (OEMP) for the project. This report acknowledges trimming would retain the individual specimen and negate the need for complete removal. This report recommends that the CEMP and OEMP for the project include mitigation and management measures identified in the EIS.

The clearance/disturbance area to be the maximum impact scenario and would likely be reduced where avoidances measures committed to by the proponent are implemented. This evaluation therefore agrees with the EIS that the loss of individuals of this species (if any) is unlikely to result in an SRI on this species.

This report includes recommendations for the Commonwealth Minister for the Environment (Appendix 3) to condition the proponent to undertake a pre-clearance survey to determine the actual number of trees that would be impacted and use the results of that survey to inform the offset requirement for the species and to include measures in the species management plan (SMP) requiring the proponent undertake trimming outside of the flowering and fruiting period.

Increased occurrence of pest and weeds

As discussed above, the Conservation Advice identifies invasive weeds, particularly rubber vine as a key threat to the black ironbox. Field surveys undertaken for the EIS indicate a number of individual specimens in the project corridor are under threat from rubber vine infestation. The rubber vine is a Category 3 restricted matter under the Queensland *Biosecurity Act 2014* and landowners have a 'general biosecurity obligation' to take all reasonable and practical steps to minimise the risks associated with invasive plants on a person's land.

The proponent has committed to the preparation and implementation of site and phase-specific biosecurity management plans as part of the CEMP and OEMP, as detailed for the pink gidgee, that would include prevention, management and monitoring measures that address pest and weed impacts on the black ironbox.

Increased fire risk

Fire poses a threat to areas of black ironbox which are more infested with invasive weed species, particularly pasture grasses such as buffel grass, which is known to increase the risk (frequency and intensity) of bushfire.

Fire could start as a result of sparks from machinery, accidents, collision between vegetation and electrical infrastructure and the maloperation or failure of transmission infrastructure components, which would then cause fires to expand into the surrounding area, including areas of black ironbox habitat.

The proponent has committed to develop and implement an emergency management plan and bushfire management plans for the construction and operation of the project, which would include emergency procedures to be followed in the event of a fire and measures to address the risk of bushfire. The proponent would undertake measures to exclude fire from the site, including firebreaks (i.e. vegetation management), warning systems and appropriate storage and handling of flammable chemicals and materials.

This report acknowledges that the transmission easement may act as a firebreak and subsequently limit the capacity of fires to burn out entire areas of habitat. For example, during construction clearing of all vegetation to ground level to accommodate the 6 m access track and 6 m line of sight for wire stringing would accommodate a 12 m wide firebreak along the entire project corridor.

6.4.3.2.4 Significant residual impacts and offsets

The EIS estimates that there is approximately 7.27 ha of suitable black ironbox habitat within the project corridor. Based on the EIS assessment, this report recognises potential for clearance or disturbance of up to 2.95 ha of suitable black ironbox habitat. This clearance/disturbance area is considered to be the maximum impact scenario and would likely be reduced where avoidance measures committed to by the proponent are implemented. This evaluation therefore agrees with the EIS that the loss of individuals of this species (if any) is unlikely to result in an SRI on this species.

This report notes that the proponent has committed to undertaking pre-clearance surveys to identify the presence of black ironbox in areas to be cleared and avoid occurrences of the species through design considerations.

Recommended conditions are included in this report to the Commonwealth Minister for the Environment (Appendix 3) requiring the proponent to undertake a pre-clearance survey to confirm the presence of the species and to avoid these occurrences to ensure no significant impact to the species. Where an SRI is determined to be likely for the species, a biodiversity offset would be required under the EPBC Act.

6.4.3.3 Waxy cabbage palm (*Livistona lanuginosa*)

6.4.3.3.1 Background

The waxy cabbage palm is listed as ‘vulnerable’ under the EPBC Act. The species is endemic to the Burdekin-Ravenswood-Cape River area inland from Ayr, where it is usually found on the tributaries of the Burdekin River (but not the Burdekin River itself). The main occurrence of the species is along the lower Cape River; however, intact populations also occur on the Campaspe River and Oaky Creek and their tributaries.

All known populations of waxy cabbage palm are growing on sandy, ephemeral watercourses or their floodplains. In periodic severe drought conditions, only stands growing on permanent soaks in stream beds survive.

The EIS mapped suitable habitat for the species based on both the current EIS and previous EIS survey effort and essential habitat factors, using RE polygons that contain REs 9.3.1, 10.3.6, 10.3.13, 10.3.14, 10.3.31, 11.3.4, 11.3.25 (as mixed or single RE polygons). It is noted in the EIS that the extent of suitable habitat mapping is broader than what species records indicate, to account for dispersal along river systems.

The survey effort undertaken for the EIS recorded 10 individuals at the eastern tributary of the Campaspe River (Oaky Creek) within the Renewable Energy Hub section. Surveys undertaken in 2010/2011 for the previous CopperString EIS process also confirmed species presence at the Campaspe River however the project corridor for this project was moved further south to avoid this population.

This report agrees with the argument presented in the EIS that the occurrence of waxy cabbage palm within the project corridor is part of an important population due to:

- only 7 distinct populations being recorded in Queensland
- the recorded locations for this project near to the north-western limit of the species range.

6.4.3.3.2 Recovery plans, conservation advice and threat abatement

There are no threat abatement or recovery plans relevant to this species. The species has an approved conservation advice: *Approved Conservation Advice for Livistona lanuginosa (Waxy Cabbage Palm)*.[63]

Priority recovery and threat abatement actions for the waxy cabbage palm in the conservation advice that are relevant to the project include:

- managing threats to areas of vegetation that contain populations/occurrences/remnants of the species
- minimising adverse impacts from land use at known sites
- ensuring infrastructure or development activities do not adversely impact known populations
- managing any changes to hydrology that may result in changes to the water table levels, increased run-off, sedimentation or pollution and any disruptions to water flows
- managing sites to prevent introduction of invasive weeds and identifying and removing weeds in way which does not have a significant adverse impact (i.e. methods other than chemical mechanisms)
- developing and implementing a suitable fire management strategy.

6.4.3.3.3 Impacts and mitigation

Direct removal of habitat

The EIS estimates that the construction and operation of the project would result in the clearance and/or disturbance of approximately 26.38 ha (12.63 ha for construction and 13.75 ha for operation) of suitable waxy cabbage palm habitat.

Across the Renewable Energy Hub section of the project corridor, the known location/s of the species is concentrated within the riparian corridors and adjacent alluvial plains of selected waterways (Campaspe River and Oaky Creek). The EIS states that through pre-clearance surveys and subsequent detailed design, transmission towers and associated infrastructure would be micro-sited (e.g. higher towers placed close to riparian areas) to span across lower-height trees and/or avoid any removal of the species, including supporting habitat. As the species height is typically less than 20 m, the EIS considers most occurrences could be spanned with no trimming or maintenance requirements. The proponent has committed to the location of transmission towers outside of any watercourse or its riparian zone and for transmission lines to span across riparian habitat to avoid occurrences of threatened flora species. In the event transmission towers need to be placed in waterways, specific design and construction requirements would be considered at these locations to minimise impacts.

At one location along the project corridor, an area of known habitat is approximately 750 m wide which exceeds the greatest span distance between transmission towers, being up to 600 m. It is acknowledged a transmission tower would be required to be placed within area of known habitat and expects the proponent would construct the tower between braided channels in the narrowest section of a waterway crossing to avoid existing channels.

This report includes recommendations for the Commonwealth Minister for the Environment (Appendix 3) to condition the proponent to undertake a pre-clearance survey to determine the actual area of waxy cabbage palm that would be impacted and use the results of that survey to inform the offset requirement for the species.

---

[63] Commonwealth of Australia, *Approved Conservation Advice for Eucalyptus raveretiana (Waxy Cabbage Palm)*, Threatened Species Scientific Committee, Department of the Environment, Water, Heritage and the Arts, Canberra, 2008, viewed 28 April 2022, **http://www.environment.gov.au/biodiversity/threatened/species/pubs/64581-conservation-advice.pdf**.

Increased occurrence of pest and weeds

As discussed above, the Conservation Advice identifies inappropriate management methods (i.e. chemical) of invasive weeds as a key threat to the waxy cabbage palm. Field surveys undertaken for the EIS indicate a number of invasive weeds currently exist in the riparian habitats inhabited by the waxy cabbage palm, including the rubber vine and parthenium. The rubber vine and parthenium are Category 3 restricted matters under the Queensland *Biosecurity Act 2014* and landowners have a 'general biosecurity obligation' to take all reasonable and practical steps to minimise the risks associated with invasive plants on a person's land.

The proponent has committed to the preparation and implementation of site and phase-specific biosecurity management plans as part of the CEMP and OEMP, as detailed for the pink gidgee, that would include prevention, management and monitoring measures that address pest and weed impacts on the waxy cabbage palm. It is expected that species specific biosecurity treatment procedures include the prohibition of chemicals for weed control in proximity to known occurrences of the waxy cabbage palm, throughout the life of the project.

Increased fire risk

As discussed in section 6.4.3.2 above, fire could start as a result of sparks from machinery, accidents, collision between vegetation and transmission lines, the maloperation or failure of transmission infrastructure components and the spread or extent of invasive weed species. The project may cause fires to expand into a variety of habitats across the project corridor, including areas of waxy cabbage palm habitat.

The proponent has committed to the preparation and implementation of emergency management plans and bushfire management plans to be included as part of the CEMP and OEMP.

The proponent is proposing to develop and implement emergency management plans and bushfire management plans during the construction and operation of the project, which would include emergency procedures to be followed in the event of a fire and measures to address the risk of bushfire. The proponent would undertake measures to exclude fire from the site, including firebreaks (i.e. vegetation management), warning systems and appropriate storage and handling of flammable chemicals and materials.

It is acknowledged that the transmission easement may act as a fire break and subsequently limit the capacity of fires to burn out entire areas of habitat. For example, during construction clearing of all vegetation to ground level to accommodate the 6 m access track and 6 m line of sight for wire stringing would create a 12 m wide firebreak along the entire project corridor.

Indirect - changes to hydrology

No potential impacts on hydrological regimes or groundwater interactions, as assessed in section 5.3 of this report, are predicted to impact on threatened flora species.

6.4.3.3.4 Significant residual impacts and offsets

The EIS identifies approximately 57.78 ha of suitable waxy cabbage palm habitat within the project corridor. The proponent has committed to undertaking pre-clearance surveys to identify the presence of waxy cabbage palm in areas to be cleared and avoid occurrences of the species through design considerations (e.g. micro-siting).

Based on the EIS assessment, this report recognises the potential clearance or disturbance of up to 26.38 ha of suitable waxy cabbage palm habitat. This clearance/disturbance area is considered to be the maximum impact scenario and would likely be reduced where avoidance measures committed to by the

proponent are implemented. The evaluation in this report therefore agrees with the EIS that the loss of individuals of this species (if any) is unlikely to result in an SRI on this species.

Recommended conditions are included in this report to the Commonwealth Minister for the Environment (Appendix 3) requiring the proponent to undertake a pre-clearance survey to confirm the presence of the species and to avoid these occurrences to ensure no significant impact to the species. Where an SRI is determined to be likely for the species, a biodiversity offset would be required under the EPBC Act.

6.4.3.4 Coordinator-General's conclusion: threatened flora species

This report is satisfied that the EIS has considered the potential impacts that the project could have on threatened flora species. The conclusions in the EIS that SRI for threatened flora species are unlikely to occur are supported.

I note that disturbance areas will be finalised during detailed design and once actual on-ground extent of impacts has been determined, the proponent would confirm offset requirements under the EPBC Act. I expect that an appropriate biodiversity offset would be delivered for any SRI to threatened flora species.

This report includes recommended conditions to the Commonwealth Minister for the Environment requiring the proponent to undertake a pre-clearance survey to confirm the presence of threatened flora species and to avoid these occurrences to ensure no significant impact to the flora species. Where an SRI is determined to be likely for the species, a biodiversity offset would be required under the EPBC Act.

6.4.4 Threatened fauna

The EIS included search outputs from the PMST which identified a number of threatened fauna species with the potential to occur within the study area and surrounds. Surveys for listed threatened species were undertaken by the proponent in accordance with the relevant Australian and Queensland government survey guidelines, including:

- EPBC Act *Survey guidelines for Australia's Threatened Reptiles*
- EPBC Act *Survey guidelines for Australia's Threatened Birds*
- EPBC Act *Survey guidelines for Australia's Threatened Bats*
- EPBC Act *Survey guidelines for Australia's Threatened Mammals*
- EPBC Act *Draft Referral guidelines for the nationally listed Brigalow Belt reptiles*
- EPBC Act *Referral Guidelines for the vulnerable koala*
- *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (Version 3).

Of those species identified in the PMST search, the EIS identified a number of those with suitable habitat present or previously recorded within the study area ('likely to occur') or observed species presence onsite during surveys ('confirmed present'), as summarised in Table 6.4. This report concludes that the surveys undertaken for listed threatened species are adequate for the assessment.

The EIS concluded that SRI for those threatened species not identified during surveys and considered only to 'may occur' or 'unlikely to occur' with the study area are unlikely. The lack of historical species records combined with the survey effort undertaken by the proponent indicated that the project corridor is unlikely to support populations of these threatened species. This report accepts this finding based on the evidence presented in the EIS.

The 10 threatened species which were either 'confirmed present' or considered 'likely to occur' were further assessed in the EIS and are considered in this evaluation.

Table 6.4 Listed threatened species likely to occur or confirmed present within the project corridor

Likely to occur - listed threatened species previously recorded or with known suitable habitat present within the project corridor – likely to occur	Confirmed present - listed threatened species identified within the project corridor during surveys – confirmed present
• red goshawk (Erythrotriorchis radiatus) – vulnerable • night parrot (Pezoporus occidentalis) – endangered • painted honeyeater (Grantiella picta) – vulnerable • Australian painted-snipe (Rostratula Australia) – endangered • ornamental snake (Denisonia maculata) – vulnerable • plains death adder (Acanthophis hawkei) – vulnerable	• squatter pigeon (southern) (Geophaps scripta scripta) – vulnerable • koala (Phascolarctos cinereus) – vulnerable • black-throated finch (southern) (Poephila cincta cincta) • Julia Creek dunnart (Sminthopsis douglasi)

The grey falcon was listed as a 'threatened species' under the EPBC Act after the controlled action decision for this project. As such, evaluation for this species is not required within Chapter 6 of this report and this report for this species is provided in section 5.2 as a matter of state environmental significance.

The white-throated needletail was also listed as a 'threatened species' under the EPBC Act after the controlled action decision for this project; however, was already listed as 'migratory species' under the EPBC Act. As such, evaluation for this species is provided in section 6.5.

6.4.4.1 Koala

6.4.4.1.1 Background

The koala was listed as 'vulnerable' under the EPBC Act when the controlled action decision was made for the project. On 12 February 2022, the EPBC Act listing status for the koala was upgraded from 'vulnerable' to 'endangered' by the Commonwealth Minster for the Environment. In accordance with section 158A of the EPBC Act, when a listed threatened species or a listed TEC becomes listed in another category representing a higher degree of endangerment, controlled action decisions made before the listing are not affected. As such, the up-listing does not impact consideration of the project impacts, however a national recovery plan for the koala was released in April 2022. The Commonwealth Minister for the Environment must not make decisions inconsistent with that recovery plan, which is discussed below.

The koala is endemic to Australia and has a wide, yet patchy distribution across coastal and inland areas of eastern Queensland. The majority of known habitat is concentrated along the south-eastern coast; however, the species has been recorded as far north as Cooktown, including the central west region of Julia Creek. The quality of habitat in inland semi-arid and arid regions in western Queensland (Mitchell Grass Downs, Desert Uplands and Einasleigh Uplands bioregions) is poorly defined. Due to the long, linear nature of the project, the EIS has considered koala habitat across inland, coastal, and inland semi-arid and arid areas, as shown in Figure 6.9 to Figure 6.11.

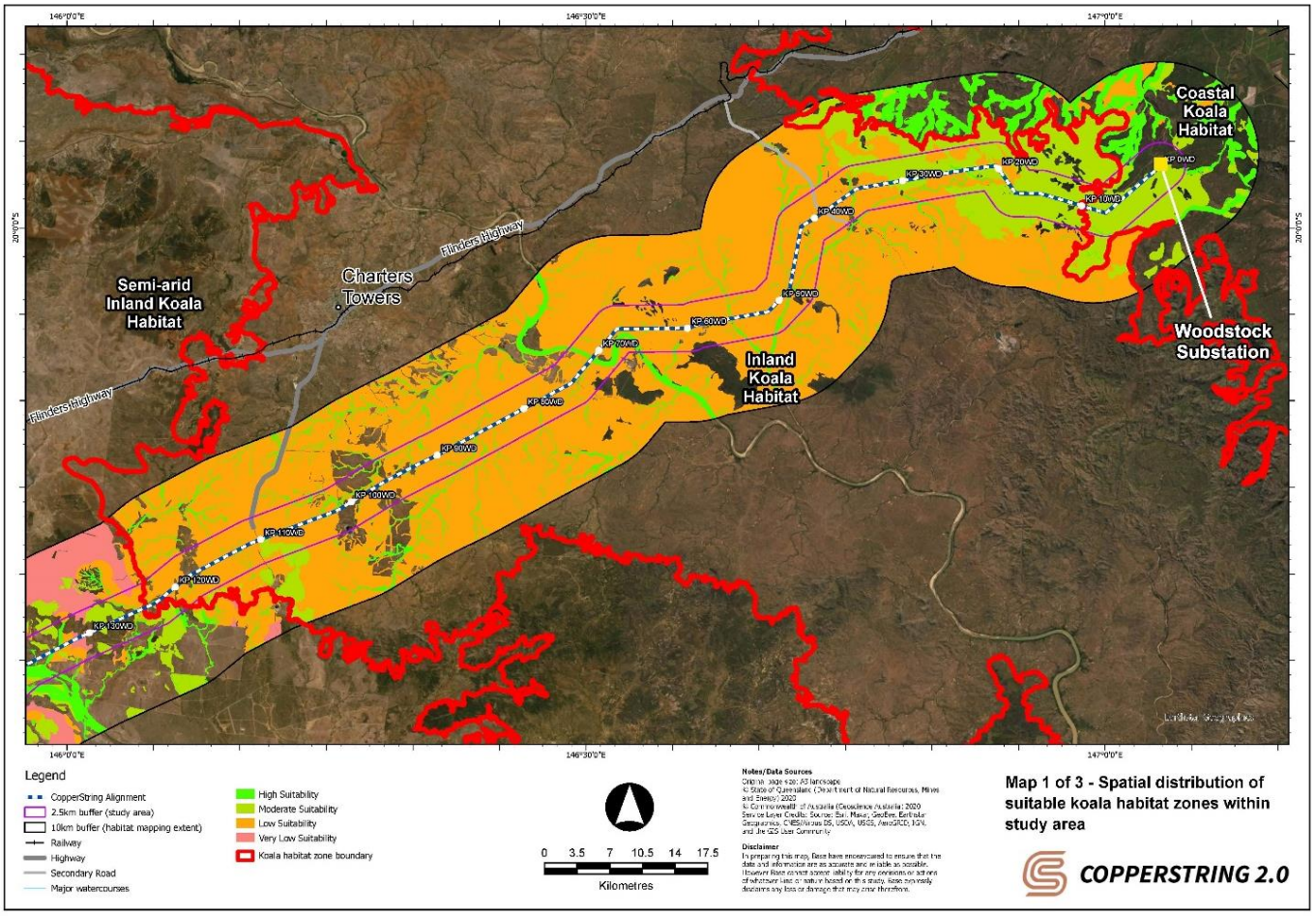

Figure 6.9 Coastal, inland and inland semi-arid areas across the project corridor (1 of 3)[64]

[64] Figures 6.9 to 6.11 - from the project EIS, Chapter 18. Updated version provided by proponent for this report.

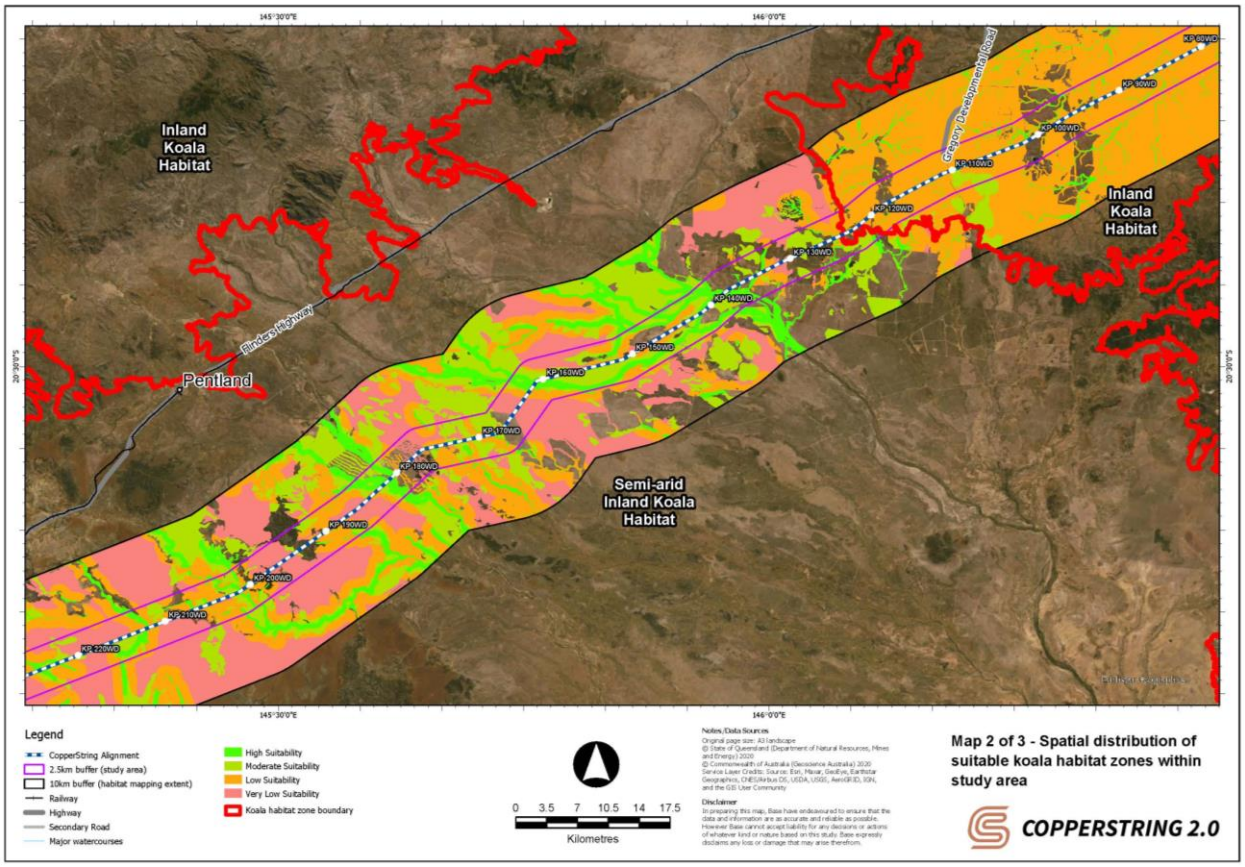

Figure 6.10 Coastal, inland and inland semi-arid areas across the project corridor (2 of 3)

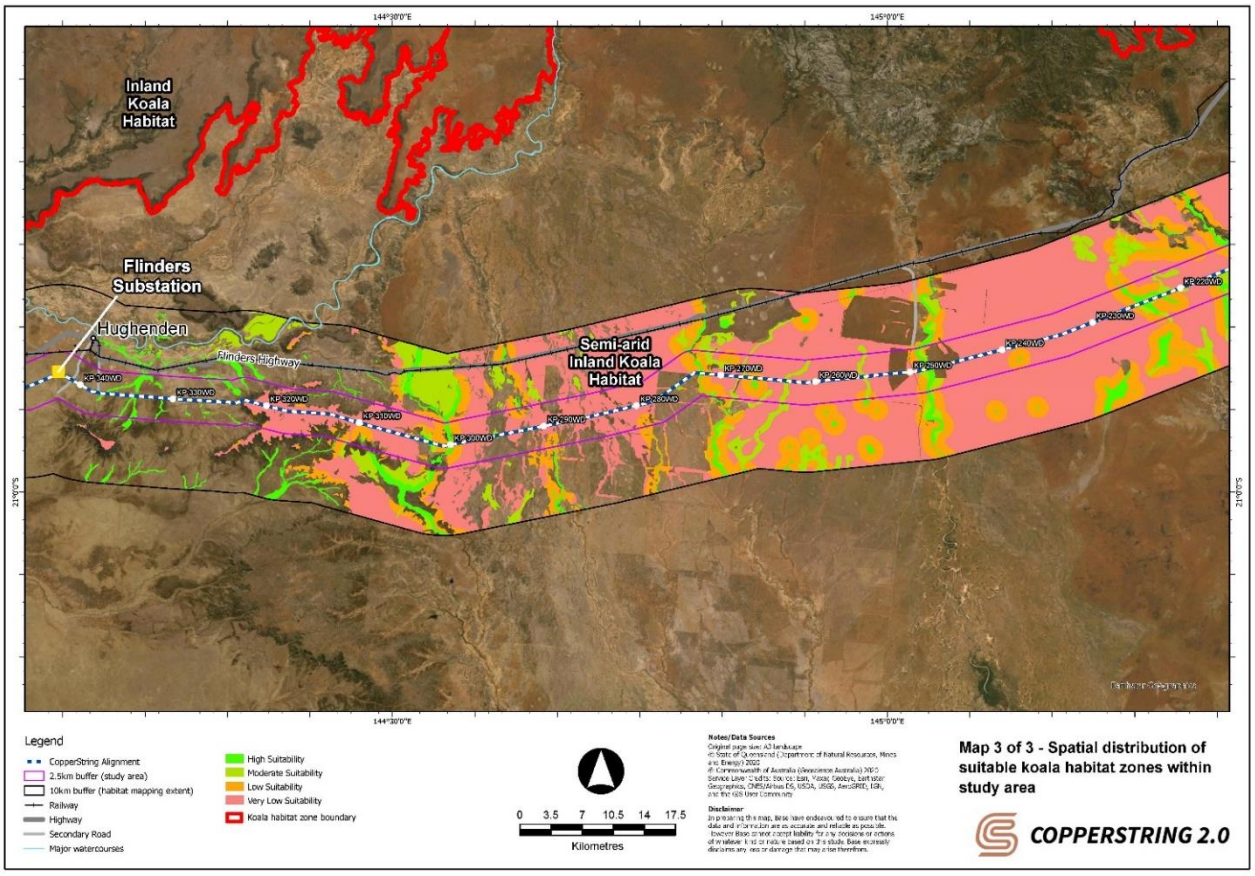

Figure 6.11 Coastal, inland and inland semi-arid areas across the project corridor (3 of 3)

Koala habitat is considered within any forest, woodland or shrubland and is defined by availability (presence and density) and nutritional quality of food trees, presence of suitable resting trees and microclimates, age and structure of vegetation, history and impediments to dispersal.

The survey effort undertaken as part of the EIS assessment confirmed koala presence at 16 locations (a single koala observed at one location and koala pellets observed at 15 locations) within the study area mostly within riparian woodland near Woodstock, Pentland and Prairie. Historically, the species has been recorded near Hughenden, Prairie, Pentland, Charters Towers and Ravenswood.

As shown in Figure 6.9 to Figure 6.11, mapped suitable habitat for the koala is limited to the Renewable Energy Hub section of the project corridor. The EIS indicates the quality and condition of habitat observed varied substantially with areas of high value habitat generally located along watercourses (i.e. Emu Creek near Prairie and Campaspe River east of Pentland) with a high density and connectivity of mature food trees. All high, moderate and low value habitat[65] within the project corridor is considered habitat critical to the survival of the species.

6.4.4.1.2 Recovery plans, conservation advice and threat abatement

Following the updated listing status for the koala, the *National Recovery Plan for the Koala (Phascolarctos cinereus) (combined populations of Queensland, New South Wales and the Australian Capital Territory)*[66] (the recovery plan) came into effect on 8 April 2022.

The approved conservation advice' for the koala, *Conservation Advice for Phascolarctos cinereus (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory, came into effect on 12 February 2022*.[67]

Key threats to the koala identified in the recovery plan and conservation advice relevant to the project include:

- loss, modification, fragmentation and degradation of native vegetation
- the predicted intensification and frequency of the effects of climate change (drought, heatwaves and bushfire) on populations due to the ongoing reduction in the availability of climate-suitable habitat
- mortality due to disease, vehicle strikes and dog attacks
- altered fire regimes and population-level recovery
- decline in habitat quality due to the emergence of myrtle rust (a plant disease) leading to defoliation, loss of reproductive capacity and dearth in eucalypts, lillypillies, paperbarks and tea-trees.

Relevant priority conservation and recovery and threat abatement actions in the conservation advice and recovery plan include:

- in the first instance avoid:
  - clearing of habitat used for feeding and resting and during extreme events (i.e. heatwaves, drought/fire refuge)
  - reducing connectivity between patches of habitat used for feeding, resting, community and dispersing

[65] As defined in EIS Volume 4, Attachment E – Revised MNES and MSES, Table 18-23
[66] Commonwealth of Australia, *National Recovery Plan for the Koala (Phascolarctos cinereus) (combined populations of Queensland, New South Wales and the Australian Capital Territory)*, Department of Agriculture, Water and the Environment, Canberra, 2022. Viewed 4 May 2022, **http://www.awe.gov.au/environment/biodiversity/threatened/publications/recovery/koala-2022**
[67] Commonwealth of Australia, *Conservation Advice for Phascolarctos cinereus (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory*, Department of Agriculture, Water and the Environment, Canberra, 2022. Viewed 8 April 2022, **http://www.environment.gov.au/biodiversity/threatened/species/pubs/85104-conservation-advice-12022022.pdf**.

- activities that would expose koalas to additional threats (i.e. dogs, vehicles) during ground movement between resting and feeding trees.

- where avoidance cannot be achieved:
  - developing and implementing planning protocols to prevent the loss of 'important habitat', koala populations or connectivity areas
  - developing and implementing plans to mitigate the risk of vehicle strike and dog predation
  - investigating formal conservation arrangements, management agreements and covenants on private land
  - developing and implementing options for vegetation recovery and reconnection in regions containing fragmented koala populations.

There is currently no TAP under the EPBC Act relevant to the koala.

6.4.4.1.3 Impacts and mitigation

Direct clearance of habitat

Habitat loss resulting from land clearance is recognised as the primary adverse effect on habitat critical to the survival of the koala. The EPBC significant impact guidelines considers that an action that is likely to have a real chance or possibility of adversely affecting habitat critical to the survival of a species is likely to have a significant impact.[68]

The EIS estimates that the construction and operation of the project would result in a total clearance and/or disturbance of approximately 393.21 ha (242.99 ha for construction and 150.22 ha for operation) of habitat identified as critical to the survival of the species, including 115.44 ha of high value habitat, 90.3 ha of medium value habitat, and 187.48 ha of low value habitat. As outlined in Table 6.4Table 6.2 above, all vegetation within these impact areas would be required to be cleared to ground level or trimmed/cut to outside of the conductor clearance zone (generally all vegetation above 3.5 m).

The EIS argued that areas of medium and low value habitat cleared for project activities, excluding fenced substation sites up to 40 ha in size, across coastal and inland areas (0-124KP) (see Figure 6.9) would not result in an SRI as the medium and low value habitat in these areas contain a widely spread canopy without primary or secondary koala food trees. As such, the loss of habitat within these areas are considered by the EIS not to adversely reduce the area of occupancy or lead to a decrease in the size of an important population of the species.

It is noted that proponent's clearing contractor undertook a tree density analysis as part of the EIS assessment which indicated some of these medium and low value habitat areas may contain denser vegetation with koala food trees, particularly along ephemeral gullies near the interface between coastal and inland areas. Until pre-clearance surveys are undertaken during the detailed design phase to confirm the presence of koala food trees within the coastal and inland areas, the proponent's conclusion that that there would not be an SRI on the koala within these areas of medium and low value habitat is not accepted.

The medium and low value habitat found within semi-arid areas (125-342KP) (see Figure 6.11) is identified in the EIS to contain a widely spread canopy frequently without primary or secondary food

[68] Commonwealth of Australia, *Matters of National Environmental Significance: Significant impact guidelines 1.1*, Department of the Environment, Water, Heritage and the Arts, 2013. Viewed 3 May 2022, **https://www.awe.gov.au/sites/default/files/documents/nes-guidelines_1.pdf**.

trees. The proponent's conclusion that a loss of isolated, scattered food trees would not be an SRI is not accepted.

The recovery plan defines koala habitat as the 'total' set of resources required by the species to meet the needs of individual survival and reproduction including:

- individual food and shelter trees and other resources within their home range, and
- the patch size, form and context of home ranges within the landscape, including:
  - patches of forest, riparian, linear and roadside vegetation associations
  - open ground, corridors and scattered paddock trees for breeding or dispersal.

In accordance with the recovery plan, the importance of open ground between isolated, scattered trees for movement between food and shelter trees within a fragmented landscape is acknowledged. As such, the loss of this type of habitat may have an impact on the survival of individual koalas.

Habitat mapped as being of very low value has been characterised in the EIS by its lower height (average height of 10 m), widely dispersed canopy cover generally without primary and secondary food trees, and distance from drought refuge. Subsequently, the EIS did not include the loss of 178.27 ha of very low value habitat in calculation of koala residual impact areas. This conclusion is accepted as these areas are unlikely to support the koala.

Following the acceptance of the draft EIS and revised draft EIS as the final EIS, the proponent provided an updated draft BOMS which provides updated impact figures and offset calculations for the koala. The updated offset obligation reflects the inclusion of calculated impact areas for all project activities within all high, medium and low value habitat within the project corridor, expanding beyond figures presented in the EIS.

As a slow-moving/sedentary species unlikely to be able to flee the clearing zone, and local abundance there is a potential for mortality or injury during construction works.

Avoidance, mitigation and management measures

The EIS states that the concept design has sought to position infrastructure within the project corridor to avoid and/or span areas of high value riparian vegetation adjacent to watercourses, where the majority of koala records exist. During detailed design, the proponent is expected to further refine the siting of transmission towers and associated infrastructure at a localised scale to minimise the direct loss of koala habitat. This would be achieved through pre-clearance surveys and micro-siting within known and potential habitat areas of conservation significant species.

The proponent has committed to the preparation and implementation of various management plans as part of the CEMP and OEMP, including:

- a flora and vegetation management plan, which would include measures to ensure clearing is undertaken sequentially, and any areas of vegetation to be retained, including habitat for the koala, are clearly identified and avoided (where possible)
- a traffic management plan for each construction site with designated access routes, speed limits and sensitive ecological areas
- a fauna management plan, which would include general avoidance, mitigation and management measures and monitoring, survey and reporting requirements to assess the persistency and health of species and rehabilitation of cleared areas required temporarily during construction

- a rehabilitation plan (and site and stage-specific rehabilitation sub-plans), which would include measures for rehabilitating land cleared within the corridor and not required during the operation and maintenance of the project.

The proponent has also committed to the preparation and implementation of SMPs as part of the fauna management plan for the conservation significant species that would be impacted by the project, including the koala. The SMPs for the koala is expected to include standard requirements for targeted pre-clearance surveys of potential habitat within the clearing footprint and measures to limit construction activities to avoid breeding seasons of threatened species, to relocate individuals identified during pre-clearance surveys by qualified and experienced fauna spotter-catchers, and to install fauna exclusion fencing and enforce speed limits onsite.

To limit injury and mortality to fauna during the construction of the project the proponent has committed to include protocols in the CEMP including management of risks associated with open excavations and trenching, and reporting for roadkill and adverse incidents.

This report includes recommendations to the Commonwealth Minister for the Environment (Appendix 3) to condition the proponent to include measures in the SMPs that would be implemented to avoid, mitigate and manage impacts to EPBC Act listed threatened species and their habitat during construction, operation and decommissioning of the project. This includes measures to prevent entrapment and mortality of EPBC Act listed threatened species within areas that are excavated including tower and substation foundations and cable trenches during construction of the project. Such measures may include minimising the time for trenches to remain open, particularly in known fauna habitat areas and the installation of temporary exclusion fencing.

Fragmentation of habitat/barrier to movement and increased risk of vehicle strike

The EIS argued that the project, particularly the 6 m wide construction access track and 6 m wide line of sight clearing located along the entire project corridor, would not result in fragmentation of the koala population into 2 or more populations nor restrict koala movement, given the abundance of the species within the wider landscape. The project corridor is also noted to intersect landscape already extensively fragmented for agricultural purposes with a large majority of project activities located within cleared or disturbed areas (as per the corridor route selection process and concept design). This report agrees that the project would not impact on fragmentation leading to restricted movement for the koala.

Avoidance, mitigation, and management measures

To limit fragmentation and reduced habitat connectivity, the proponent has committed to implement the following mitigation measures during construction as part of the CEMP and associated management plans:

- where possible, access tracks would be restricted to areas that are already disturbed and/or co-located within conductor clearance zones
- all major (hub) construction laydown areas, stockpiles, hardstand areas and areas needed for ancillary activities would be limited to areas that have already been cleared to minimise unnecessary clearing and footprints minimised where possible without compromising the safety and integrity of structures
- temporary construction areas (such as tower assembly areas and brake and winch sites) would be rehabilitated to grassland after the completion of construction works with natural revegetation expected to occur to reconnect fragmented habitats
- during the detailed design stage, areas of high habitat connectivity (e.g. riparian areas) that are intersected by the project would be identified and measures investigated that would improve or

restore connectivity across the project corridor. Measures may include the retention of vegetation between large remnant patches that hold significant habitat value

- local ecological management plans would be developed and implemented during construction for areas of high ecological sensitivity which require targeted management measures in accordance with the design specifications and recommendations outlined in the FDP to manage construction risks to these areas, including koala movement corridors.

The proponent has also committed to implement mitigation measures as part of the OEMP to mitigate barrier effects on fauna movement during operation of the project, which would include measures such as targeted rehabilitation and revegetation of temporary construction areas to maintain and increase habitat connectivity and use of designated access tracks and waterway crossing points to minimise disruption to wildlife movement.

The EIS identifies the risk that increased in traffic movements during construction may have the potential to result in vehicle strike causing injury or mortality. Operation of the project (i.e. maintenance activities) would be expected to generate minimal, sporadic vehicle movements unlikely to pose a significant risk to fauna.

To address the increased risk of vehicle strike to fauna including the koala, the proponent has committed, where non-gazetted roads or tracks are located adjacent to observed breeding habitat during pre-clearance surveys, to the enforcement of 'go slow zones' with an on-site speed limit of 40 km/hr for vehicles and machinery.

Increased fire risk

Fire could start as a result of sparks from machinery, accidents, collision between vegetation and transmission lines, the maloperation or failure of transmission infrastructure components and the spread or extent of invasive weed species. The project may cause fires to expand into a variety of habitats across the project corridor; however, this report accepts the conclusion that the transmission easement may act as a fire break and subsequently limit the capacity of fires to burn out entire areas of habitat.

Avoidance, mitigation, and management measures

The proponent is proposing to develop and implement an emergency management plans and bushfire management plans for the construction and operation of the project, which would include emergency procedures to be followed in the event of a fire and measures to address the risk of bushfire. The proponent would undertake measures to exclude fire from the site, including firebreaks (i.e. vegetation management), warning systems and appropriate storage and handling of flammable chemicals and materials.

Spread of disease

Koalas are threatened primarily by diseases such as chlamydia and koala retrovirus and this report acknowledges that the diseases may occur in the koala populations found on and around the project corridor. The EIS considers that the project would not include activities likely to result in the spread of a disease that may cause the species to decline. However, it is considered that any koalas identified during pre-clearance surveys that are subsequently translocated could act to spread disease as both diseases are considered by the recovery plan to be prevalent in koala populations in Queensland.

Avoidance, mitigation, and management measures

As stated above, the proponent has committed to the preparation and implementation of a SMP for the species to be impacted by the project. It is expected that koala management measures in the SMP include provisions to address the spread of diseases relevant to the koala. Measures targeted at

minimising stress for the species, which is linked with an increase in the expression of chlamydia in koalas, include sequential clearing, site speed limits, use of experienced spotter-catchers during clearing and the requirement to allow koalas to self-disperse.

Increased risk of dog attack

Mortality in koalas due to wild dog attack is one of the key threats to the species. Wild dogs were not observed within the project corridor during field surveys. However, the EIS considers wild dogs are likely to occur across the coastal koala habitat and may be drawn to prey opportunities presented by the cleared linear project corridor or facilitate greater regional movement. Despite this, the EIS considers that the project would not result in increased levels of threat of dog attack for the koala as these threats are already present in the existing environment.

Avoidance, mitigation, and management measures

The proponent has committed to prepare and implement site and phase-specific biosecurity management plans as part of the project CEMP and OEMP, which would include specific measures to control individual pest species identified within the project corridor in accordance with the Queensland Biosecurity Regulation 2016. A relevant biosecurity management plan is expected to include measures such as trapping and removing any wild dogs identified onsite to reduce the risk of dog attack.

Disturbance from noise, vibration and artificial lighting

The EIS considered that the construction and operation of the project may cause localised increases in noise, vibration and lighting disturbance in habitats adjacent to the project activities which may cause disruption of foraging, breeding and nesting behaviours. Nocturnal animals would be more susceptible to noise, vibration and lighting disturbance, due to their sensitivity to noise and light.

The EIS predicted that any potential noise, vibration and lighting-related impact to fauna within surrounding habitat would be localised and minor, with continuous disturbance unlikely to occur at one location for a long period of time due to the progressive construction methodology along the project corridor. Therefore, significant impacts to fauna resulting from noise, vibration and lighting impacts resulting from the construction and operation of the project are not expected to occur. This report agrees that noise, vibration and artificial lighting from construction or operation of the project is unlikely to result in an adverse impact on the koala.

Avoidance, mitigation, and management measures

The proponent has committed to implement the following mitigation measures during construction and operation as part of the CEMP and OEMP:

- site lighting would be kept to the minimum required for safety purposes and no permanent artificial lighting will be used on transmission towers or supporting infrastructure
- activities would be scheduled during standard work daytime hours, where possible, to reduce the need for artificial lighting and to reduce noise and vibration impacts
- vehicle movements would be controlled to reduce the unnecessary generation of vehicle noise.

6.4.4.1.4 Significant residual impacts and offsets

In summary and based on the information provided in the EIS, the clearance of approximately 393.21 ha of habitat critical to the survival of the koala, as outlined in Table 6.5, may result in an SRI to the species and would require biodiversity offsets under the EPBC Act.

This report does not agree with the SRI area presented in the EIS for the koala. A larger SRI area is concluded by this report due to the following key considerations:

- a conservative, precautionary approach has been taken in estimating whether clearing impacts should be considered an SRI
- clearing of vegetation for construction and operation of the project, as such removal of dense tree vegetation canopies, would result in an instant loss of habitat critical to the survival of the koala, including food and non-food trees
- natural rehabilitation to pre-disturbance quality can take a considerable period of time based on climatic and substrate factors and continuing pressures from the operational use of the area
- temporary and permanent project activity impact areas have been considered cumulatively along the entire 1,000 km project corridor.

Table 6.5 Significant residual impact area totals for the koala

Habitat value	Temporary project activity – construction (ha)	Permanent project activity – operation (ha)	Total (ha)
High	68.235	47.200	115.435
Medium	51.980	38.320	90.300
Low	122.775	64.700	187.475
			393.210

Since acceptance of the final EIS, the proponent has provided an updated draft BOMS that reflects the SRI area totals for this species as identified in Table 6.5. These SRI area totals are considered by this evaluation report to be the maximum acceptable for this project. Updated SRI areas for each stage of construction would be confirmed through pre-clearance surveys and during detailed design, prior to commencement of clearing for the relevant stage. The actual SRI would then be confirmed by a post-construction audit.

The updated draft BOMS identified where suitable offsets for this species may be provided, subject to confirmation of actual SRI impact areas. Reporting on actual SRI areas must include quality scoring for the impacted areas, to determine ultimate offset obligation in line with the EPBC Act assessment guide and calculator. Potential offset properties have been identified in the updated draft BOMS that would provide for offset of SRIs along the whole project.

This report includes recommended conditions to the Commonwealth Minister for the Environment (Appendix 3):

- defining maximum koala habitat disturbance limits and requirements for the proponent to provide offsets for the SRI for the koala
- requiring that a SMP be prepared for the koala. The plan must align with the EPBC Act requirements, recovery plan, conservation advice and any relevant TAP. The SMP also includes a requirement for the proponent to:
  - ensure that a 40 km/hr speed limit is enforced within the project corridor where non-gazetted roads or tracks are located within and/or adjacent to koala habitat areas
  - ensure that clearing within koala habitat is undertaken sequentially and outside of peak breeding season as a priority
- requiring that all land temporarily cleared for the construction of the project and not required for use during operation (also referred to as rehabilitation areas) be reinstated to the pre-disturbed state and monitored for an appropriate period of time to ensure establishment and long-term sustainability.

6.4.4.1.5 Coordinator-General's conclusion: koala

The EIS has satisfactorily considered the potential impacts that the project could have on the koala.

The project is expected to result in an SRI to the koala. Conditions to the Commonwealth Minister for the Environment are recommended in this report (Appendix 3) requiring a SMP be developed and implemented for the koala, and that an appropriate biodiversity offset is delivered for impacts to koala habitat.

In consideration of the proposed mitigation and management measures, proponent commitments, the draft BOMS and conditions recommended in this report, this report concludes that the approved conservation advice for this species has been considered; the proposed management actions are not inconsistent with the relevant conservation advice and recovery plan; and the impacts on the koala are not unacceptable.

6.4.4.2 Squatter pigeon (southern)

6.4.4.2.1 Background

The squatter pigeon is listed as 'vulnerable' under the EPBC Act. The known distribution of the squatter pigeon extends south from the Burdekin-Lynd divide in the southern region of the Cape York Peninsula to the Border Rivers region of northern NSW, and from the east coast to Hughenden, Longreach and Charleville in Queensland. The species occurs in remnant and regrowth open forest and woodland dominated by Eucalyptus, Corymbia, Acacia and Callitris species with tussock grassy understorey within 3 km of permanent water sources such as rivers, creeks and waterholes.

The squatter pigeon was observed throughout most of the eastern extent of the study area during the survey effort undertaken for the EIS. Observations were predominantly within highly disturbed environments where water was permanently available. Surveys undertaken for the previous CopperString EIS process also confirmed species at 28 locations in flocks up to 27 in the eastern extent of the project corridor.

Breeding and foraging habitat for the squatter pigeon within the project corridor is restricted to well-draining, gravelly, sandy or loamy soils with a tussock-grassy understorey which the EIS has mapped to occur throughout most of the Renewable Energy Hub and CopperString Core sections (refer to Figure 6.12).

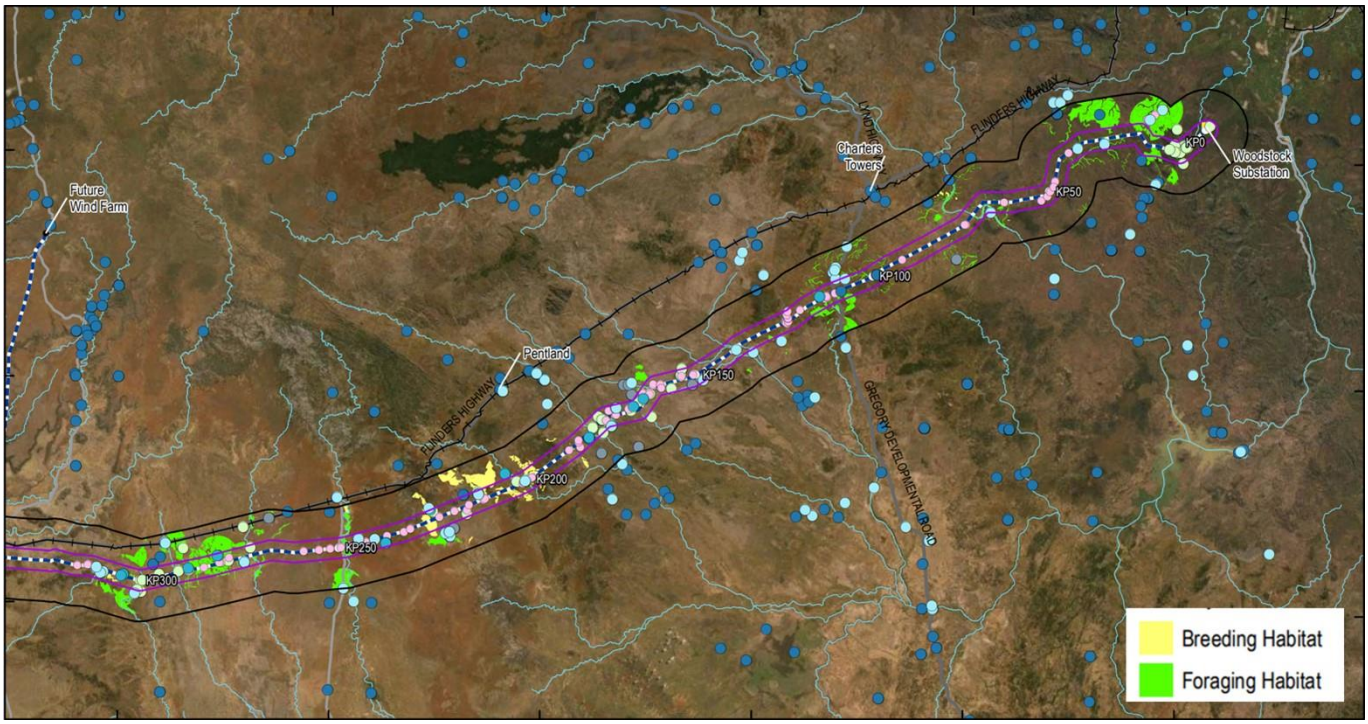

Figure 6.12 Records and distribution of suitable habitat for the squatter pigeon within the study area

6.4.4.2.2 Recovery plans, conservation advice and threat abatement

There is no recovery plan relevant to the squatter pigeon. The species has an approved conservation advice: *Approved Conservation Advice for Geophaps scripta (Squatter pigeon (southern))*.[69] Key threats to this species identified in the conservation advice relevant to the project include:

- ongoing clearance and fragmentation of habitat for farming or development
- habitat degradation by invasive weeds including buffel grass *(Cenchrus ciliaris)*
- inappropriate fire regimes
- predation from feral cats and foxes.

Key priority recovery and threat abatement actions include:

- protecting, rehabilitating and managing threats to areas of vegetation that support important populations
- developing and implementing management plans for the control and eradication of feral herbivores (including grazing stock) in areas inhabited by the squatter pigeon
- implementing appropriate recommendations outlined in the TAPs.

The following TAPs are relevant to the species:

- *Threat abatement plan for predation by feral cats*[70]

[69] Commonwealth of Australia, Approved Conservation Advice for Geophaps scripta (Squatter pigeon (southern)), Department of the Environment, Canberra, 2015. Viewed 4 May 2022, **http://www.environment.gov.au/biodiversity/threatened/species/pubs/64440-conservation-advice-31102015.pdf**

[70] Commonwealth of Australia, Threat abatement plan for predation by feral cats, Department of the Environment, Canberra, 2015. Viewed May 2022, **http://www.environment.gov.au/system/files/resources/78f3dea5-c278-4273-8923-fa0de27aacfb/files/tap-predation-feral-cats-2015.pdf**.

- *Threat abatement plan for competition and land degradation by rabbits*[71]
- *Threat abatement plan for predation by the European red fox*.[72]

6.4.4.2.3 Impacts and mitigation

Direct clearance of habitat

The EIS identified that the construction and operation of the project would result in a total clearance and/or disturbance of approximately 63.26 ha (38.63 ha for construction and 24.63 ha for operation) of potential breeding, foraging and dispersal habitat for the squatter pigeon.

Avoidance, mitigation, and management measures

The proponent has committed to the preparation and implementation of a flora and vegetation management plan, traffic management plan, fauna management plan and a SMP as part of the CEMP, as detailed for the koala, and would include measures that address the project's impacts on the squatter pigeon. Pre-clearance surveys to be undertaken during the detailed design phase will identify the location of breeding places for the species which will be clearly marked to ensure these areas are avoided where possible in accordance with measures outlined the flora and vegetation management plan.

Due to the species' sedentary nature, the squatter pigeon is specifically susceptible to mortality or injury during construction works because of clearing activities, including an increase in traffic movements. The proponent proposes to flush areas of potential habitat immediately prior to clearing (i.e. spotter-catcher to walk in front of clearing machinery) to allow dispersion from construction sites ahead of machinery. Further, to reduce the potential for vehicle collision, the proponent has committed to, as part of the traffic management plan, erect warning signs on access tracks (construction and operational) that intersect locations in which the species has been confirmed present and maintain a register of all sightings to ensure areas of high risk of collision are identified.

Increased fire risk

Fire could start as a result of sparks from machinery, accidents, collision between vegetation and transmission lines, the maloperation or failure of transmission infrastructure components and the spread or extent of invasive weed species. The project may cause fires to expand into a variety of habitats across the project corridor; however, this report accepts the conclusion that the transmission easement may act as a fire break and subsequently limit the capacity of fires to burn out entire areas of habitat.

Avoidance, mitigation, and management measures

The proponent has committed to develop and implement emergency management plans and bushfire management plans for the construction and operation of the project, which would include emergency procedures to be followed in the event of a fire and measures to address the risk of bushfire. The proponent would undertake measures to exclude fire from the site, including firebreaks (i.e. vegetation management), warning systems and appropriate storage and handling of flammable chemicals and materials.

---

[71] Commonwealth of Australia, Threat abatement plan for competition and land degradation by rabbits, Department of the Environment and Energy, Canberra, 2016. Viewed May 2022, **http://www.environment.gov.au/system/files/resources/78f3dea5-c278-4273-8923-fa0de27aacfb/files/tap-predation-feralcats-2015.pdf**

[72] Commonwealth of Australia, Threat abatement plan for predation by the European red fox, Department of the Environment, Water, Heritage and the Arts, Canberra, 2008. Viewed May 2022, **http://www.environment.gov.au/biodiversity/threatened/publications/tap/predation-european-red-fox**.

Increased occurrence of weeds and pests

The nature of the project as a long linear corridor is likely to facilitate the spread of feral cats and foxes, key predators for the squatter pigeon, and subsequently increase predation pressures on threatened species. While rabbits pose a threat through competition for food resources and through contributing to the degradation of habitat for the squatter pigeon, rabbits were not observed within the study area. Buffel grass was recorded within the study area and is known to contribute to squatter pigeon habitat degradation through competition with grass species that provide food for the squatter pigeon and reducing vegetative cover.

In Queensland, the European red fox is a Category 3, 4, 5 and 6 restricted matter and the feral cat is a Category 3, 4, and 6 restricted matter under the Queensland *Biosecurity Act 2014*. Under this Act, landowners have a 'general biosecurity obligation' to take all reasonable and practical steps to minimise the risks associated with invasive plants and animals on a person's land.

Avoidance, mitigation, and management measures

The proponent has committed to prepare and implement site and phase-specific biosecurity management plans (also referred to as weed and pest management plan) as part of the CEMP and OEMP, which would include specific measures to control individual pest and weed species, such as feral cats, foxes and buffel grass identified within the project corridor, in accordance with the Queensland Biosecurity Regulation 2016.

As outlined in the concept biosecurity plan for the project,[73] the proponent would undertake post rehabilitation monitoring and reporting of temporary construction areas for a minimum period of 2 years to confirm temporary construction areas have been successfully rehabilitated and no longer require ongoing weed management. If weed infestations are reported, the proponent would be expected to remove and dispose of any infestations appropriately and subsequently undertake a review of the existing weed control procedures.

The proponent has also committed to the preparation of a waste management plan as part of the CEMP to ensure responsible waste management practices are implemented during construction works, including the appropriate disposal and removal of waste from site. Waste management practices would ensure the introduction/attraction of pest species to the construction site is minimised.

It is considered that the proponent's commitments to implement pest and weed management measures would ensure the spread of invasive species within the project corridor is minimised and is therefore not inconsistent with the relevant TAPs for the squatter pigeon.

Disturbance from noise, vibration and artificial lighting

The EIS considers that the squatter pigeon would be susceptible to indirect impacts including noise, vibration and artificial lighting impacts mainly during construction for the project. As the potential impacts would be similar for all species, further discussion is provided in the assessment of impacts to the koala in section 6.4.4.1.

6.4.4.2.4 Significant residual impacts and offsets

The EIS considered that only the removal of 0.56 ha of potential foraging and breeding habitat, located within specified CEV hut sites which are located near a water source, would result in an SRI to the squatter pigeon. No rehabilitation of CEV hut sites is proposed by the proponent and therefore vegetation must be permanently cleared for the CEV hut site, access track and a bushfire clearance

[73] From the project EIS Volume 3, Appendix U – Concept biosecurity plan.

zone to maintain and avoid fire hazards. The EIS argued that all remaining project activities (temporary and permanent) would not result in an SRI for the following reasons:

- the local population is not considered among the important populations as it is at the northern extent of the sub-species range where squatter pigeons are locally abundant
- the species already utilises habitats subject to fragmentation (cattle grazing, tractor network, dams), occurring in sparse, open woodland habitats
- access to water sources and local on-ground connectivity between breeding and habitat would be maintained throughout all stages of the project.

Based on the information provided, this report does not agree with the SRI area presented in the EIS for the squatter pigeon. A larger SRI is concluded by this report due to the following key considerations:

- a conservative, precautionary approach has been taken in estimating whether clearing impacts should be considered an SRI
- clearing of vegetation for temporary infrastructure/activities would result in an instant loss of habitat, including breeding, foraging and dispersal habitat
- natural rehabilitation to pre-disturbance quality can take a considerable period of time based on climatic and substrate factors and continuing pressures from the operational use of the area
- the clearance of breeding habitat to ground level with rehabilitation to grassland only, as such removal of dense tree vegetation canopies has been considered likely to reduce the opportunity for breeding
- temporary construction activities including the construction of roads, structures and/or hard surfaces and association earthwork or excavation works would lead to the loss and degradation of squatter pigeon habitat
- temporary and permanent project activity impact areas have been considered cumulatively along the entire 1,000 km project corridor
- construction is proposed to occur during peak breeding season.

This report considers that the clearance 50.82 ha of potential squatter pigeon habitat for the project activities outlined in Table 6.6 may result in an SRI to the species and if so, require the provision of biodiversity offsets under the EPBC Act.

Table 6.6 Significant residual impact totals for the squatter pigeon

Habitat type	Temporary project activity – construction (ha)	Permanent project activity – operation (ha)	Total
Breeding	31.38	10.67	42.05
Foraging	7.25	1.52	8.77
			50.82

Since acceptance of the final EIS, the proponent has provided an updated draft BOMS that reflects the SRI area totals for this species as identified in Table 6.6 These SRI area totals are considered by this evaluation/report to be the maximum acceptable for this project. Updated SRI areas for each stage of construction would be confirmed through pre-clearance surveys and during detailed design, prior to commencement of clearing for the relevant stage. The actual SRI would then be confirmed by a post-construction audit.

The updated draft BOMS identified where suitable offsets for this species may be provided, subject to confirmation of actual SRI impact areas. Reporting on actual SRI areas must include quality scoring for

the impacted areas, to determine ultimate offset obligation in line with the EPBC Act assessment guide and calculator. Potential offset properties have been identified in the updated draft BOMS that would provide for offset of SRIs along the whole project.

This report includes recommended conditions to the Commonwealth Minister for the Environment (Appendix 3):

- defining maximum squatter pigeon habitat disturbance limits and requirements for the proponent to provide offsets for the SRI for the squatter pigeon
- requiring that a SMP be prepared for the squatter pigeon; the plan must align with the EPBC Act requirements, recovery plan, conservation advice and any relevant TAP. The SMP also includes a requirement for the proponent to:
  - ensure that areas of potential habitat are flushed immediately prior to any clearing works
  - maintain a register of squatter pigeon sightings and provide warning signs at suitable intervals along access tracks which pass through areas of confirmed presence
- requiring that all rehabilitation areas be reinstated to the pre-disturbed state and monitored for an appropriate period of time to ensure establishment and long-term sustainability.

6.4.4.2.5 Coordinator-General's conclusion: squatter pigeon

The EIS has satisfactorily considered the potential impacts that the project could have on the squatter pigeon.

The project is expected to result in an SRI to the squatter pigeon. Conditions to the Commonwealth Minister for the Environment are recommended in this report (Appendix 3) requiring a SMP be developed and implemented for the squatter pigeon, and that an appropriate biodiversity offset is delivered for impacts to for squatter pigeon habitat.

In consideration of the proposed mitigation and management measures, proponent commitments, the draft BOMS and conditions recommended in this report, it is concluded that the approved conservation advice for this species has been considered; the proposed management actions are not inconsistent with the relevant conservation advice; and the impacts on the squatter pigeon are not unacceptable.

6.4.4.3 Black-throated finch

6.4.4.3.1 Background

The black-throated finch (BTF) is listed as 'endangered' under the EPBC Act. The range of species distribution has experienced a significant decline in recent decades and is now confined to a few scattered locations throughout northern Queensland, including sites near Townsville and Charters Towers. The nomadic species inhabits grassy woodland dominated by eucalypts, paperbarks or acacias, in close proximity to water sources and with an abundance of seeding grasses.

The BTF was observed within the Renewable Energy Hub section during the survey effort undertaken as part of the EIS assessment and the previous CopperString EIS process. Historically, the species has been recorded at multiple locations within and surrounding the eastern extent of the study area. The *Significant impact guidelines for the endangered black-throated finch (southern) (Poephila cincta cincta)* recognizes the area between Prairie and Torrens Creek as an important area for the species.

As shown in Figure 6.13, mapped suitable habitat for the BTF, including seasonal and permanent breeding habitat, is abundant throughout the Renewable Hub section of the project corridor.

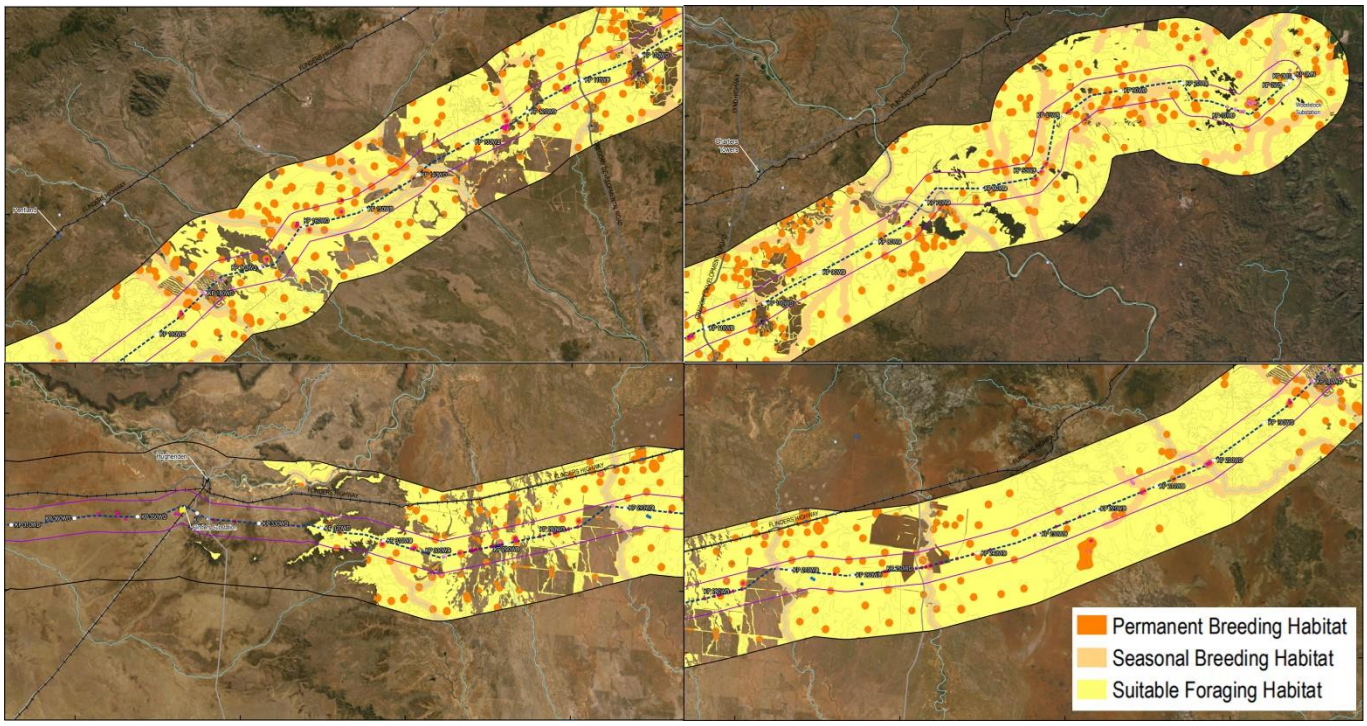

Figure 6.13 Records and distribution of suitable habitat for the black-throated finch within the study area (chainage KP0 to KP340)

6.4.4.3.2 Recovery plans, conservation advice and threat abatement

There is no approved conservation advice relevant to the BTF. The species has an approved recovery plan: *National recovery plan for the black-throated finch southern subspecies* (Poephila cincta cincta).[74] Key threats to this species identified in the conservation advice relevant to the project include:

- ongoing clearance and fragmentation of woodland, riverside habitats and wattle shrubland
- habitat degradation by invasive pest and exotic weed species (i.e. grasses)
- inappropriate fire regimes
- predation from introduced predators.

Key priority recovery and threat abatement actions include:

- protecting and enhancing habitat where the species is known to occur including monitoring management effectiveness
- implementing appropriate recommendations outlined in the TAPs.

The following TAPs are relevant to the species:

- *Threat abatement plan to reduce the impacts on northern Australia's biodiversity by the five listed grasses*[75]
- *Threat abatement plan for competition and land degradation by rabbits.*

[74] Commonwealth of Australia, National recovery plan for the black-throated finch southern subspecies (Poephila cincta cincta), Black-throated Finch Recovery Team, Department or Environment and Climate Change (NSW) and Queensland Parks and Wildlife Service, 2008. Viewed 4 May 2022, **https://www.awe.gov.au/sites/default/files/documents/p-cincta.pdf**

[75] Commonwealth of Australia, Threat abatement plan to reduce the impacts on northern Australia's biodiversity by the five listed grasses, Department of the Sustainability, Environment, Water, Population and Communities, Canberra, 2012. Viewed May 2022, **https://www.awe.gov.au/sites/default/files/documents/five-listed-grasses-tap.pdf**.

6.4.4.3.3 Impacts and mitigation

Direct clearance of habitat

The EIS estimated that the construction and operation of the project would result in a total clearance and/or disturbance of approximately 705.9 ha (413.16 ha for construction and 292.74 ha for operation) of potential breeding (permanent, semi-permanent and seasonal) and foraging habitat for the BTF.

Avoidance, mitigation, and management measures

The proponent has committed to the preparation and implementation of a flora and vegetation management plan, traffic management plan, fauna management plan and a SMP as part of the CEMP, as detailed for the koala, and would include measures that address the project's impacts on the BTF.

The EIS identified that important habitat areas for the species such as key drinking sites and breeding habitat surrounding waterbodies have been largely avoided through the concept design. To further minimise vegetation clearance impacts to these areas, the proponent has committed to undertake pre-clearance surveys during the detailed design phase to identify and avoid, where possible through micro-siting, breeding habitat in proximity to permanent waterbodies.

Fragmentation of habitat/barrier to movement and increased risk of vehicle strike

The EIS argued that project would not result in fragmentation of the BTF population into 2 or more populations nor restrict BTF movement given no physical barriers (i.e. fencing) would be constructed along the project corridor (excluding individual substation and CEV hut sites). The EIS anticipates the species would continue to utilise the project corridor without restriction.

Avoidance, mitigation, and management measures

To limit fragmentation and reduced habitat connectivity, the proponent has committed to implement mitigation measures during construction and operation as part of the CEMP and OEMP, as discussed in section 6.4.4.1 for the koala. This report is satisfied that the measures committed to by the proponent would address risks of impacts on BTF due to habitat fragmentation and vehicles.

Increased fire risk

Fire could start as a result of sparks from machinery, accidents, collision between vegetation and transmission lines, the maloperation or failure of transmission infrastructure components and the spread or extent of invasive weed species. The project may cause fires to expand into a variety of habitats across the project corridor; however, this report accepts the conclusion that the transmission easement may act as a fire break and subsequently limit the capacity of fires to burn out entire areas of habitat.

Avoidance, mitigation, and management measures

The proponent is proposing to develop and implement an emergency management plans and bushfire management plans for the construction and operation of the project, which would include emergency procedures to be followed in the event of a fire and measures to address the risk of bushfire. The proponent would undertake measures to exclude fire from the site, including firebreaks (i.e. vegetation management), warning systems and appropriate storage and handling of flammable chemicals and materials.

Increased occurrence of weeds and pests

Hymenachne was predicted to occur within the study area based on a desktop assessment undertaken for the EIS; however, the weed species was not recorded during field surveys. Hymenachne is one of the 5 introduced grasses listed in the TAP and is known to contribute to BTF habitat degradation and food

availability through the competition with grass species providing food for the BTF. The remaining 4 introduced grasses are not predicted to occur within or surrounding the project corridor.

In Queensland, the hymenachne is a Category 3 restricted matter under the Queensland *Biosecurity Act 2014*. Under this Act, landowners have a 'general biosecurity obligation' to take all reasonable and practical steps to minimise the risks associated with invasive plants and animals on a person's land.

Avoidance, mitigation, and management measures

The proponent has committed to prepare and implement site and phase-specific biosecurity management plans (also referred to as weed and pest management plan) as part of the CEMP and OEMP, which would include specific measures to control individual pest and weed species, including introduced grass identified within the project corridor, in accordance with the Queensland Biosecurity Regulation 2016.

Disturbance from noise, vibration and artificial lighting

The EIS considers that the BTF would be susceptible to indirect impacts including noise, vibration and artificial lighting impacts mainly during construction for the project. As the potential impacts would be similar for all species, further discussion is provided in the assessment of these impacts to the koala in section 6.4.4.1.

6.4.4.3.4 Significant residual impacts and offsets

The EIS considered that the removal and/or disturbance of 52.81 ha of breeding habitat (permanent and seasonal) for permanent project activities in proximity of water sources, including open forests and riparian zones, would result in an SRI as breeding of the species within these areas may be hindered. The only temporary project activity considered by the EIS to result in an SRI was for line of sight clearing of permanent breeding habitat within the riparian zone.

The EIS argued that clearing for temporary and permanent activities within foraging habitat and clearing for temporary activities within the remaining breeding habitat (excluding line of sight clearing of permanent breeding areas within the riparian zone) would not result in an SRI for the following reasons:

- there is sufficient foraging habitat adjacent to construction sites to sustain the species throughout the construction period
- construction is unlikely to impact species breeding as most of the construction would be scheduled during the dry season
- breeding habitat surrounding waterbodies have been largely avoided with potential breeding habitat to be further surveyed to identify opportunity for avoidance of impacts through micro-siting.

Based on the information provided, this report does not agree with the SRI area presented in the EIS for the BTF. A larger SRI area is concluded by this report due to the following key considerations:

- a conservative, precautionary approach has been taken in estimating whether clearing impacts should be considered an SRI
- clearing of vegetation for temporary infrastructure/activities would result in an instant loss of habitat, including foraging habitat
- natural rehabilitation to pre-disturbance quality can take a considerable period of time based on climatic and substrate factors and continuing pressures from the operational use of the area
- the clearance of breeding habitat to ground level with rehabilitation to grassland only, as such removal of dense tree vegetation canopies has been considered likely to reduce the opportunity for breeding

- temporary construction activities including the construction of roads, structures and/or hard surfaces and associated earthwork or excavation works would lead to the loss and degradation of BTF habitat
- temporary and permanent project activity impact areas have been considered cumulatively along the entire 1,000 km project corridor
- proper management of the habitat of the southern subspecies of the BTF is critical to the survival of the species.

A significant impact on the BTF (southern) is likely if an action threatens to disrupt access to or availability of one or more the 3 key resources (water, seeding grasses and nesting trees).

This report considers that the clearance 705.9 ha of potential BTF habitat for the project activities outlined in Table 6.7 may result in an SRI to the species and would require biodiversity offsets under the EPBC Act.

Table 6.7 Significant residual impact totals for the black-throated finch

Habitat type	Temporary project activity – construction (ha)	Permanent project activity – operation (ha)	Total (ha)
Permanent and semi-permanent breeding outside of riparian zone	36.49	22.83	59.32
Breeding within riparian zone	34.80	25.25	60.05
Seasonal breeding	320.94	223.56	544.50
Foraging	20.93	21.10	42.03
			705.90

Since acceptance of the final EIS, the proponent has provided updated draft BOMS that reflects the SRI area totals for this species as identified in Table 6.7. These SRI area totals are considered by this evaluation report to be the maximum acceptable for this project. Updated SRI areas for each stage of construction would be confirmed through pre-clearance surveys and during detailed design, prior to commencement of clearing for the relevant stage. The actual SRI would then be confirmed by a post-construction audit.

The updated draft BOMS identified where suitable offsets for this species may be provided, subject to confirmation of actual SRI impact areas. Reporting on actual SRI areas must include quality scoring for the impacted areas, to determine ultimate offset obligation in line with the EPBC Act assessment guide and calculator. Potential offset properties have been identified in the updated draft BOMS that would provide for offset of SRIs along the whole project.

This report includes recommended conditions to the Commonwealth Minister for the Environment (Appendix 3):

- defining the maximum BTF habitat disturbance limits and requirements for the proponent to provide offsets for the SRI for the BTF
- requiring that a SMP be prepared for the BTF. The plan must align with the EPBC Act requirements, recovery plan, conservation advice and any relevant TAP. The SMP also includes a requirement for the proponent to ensure that no clearing of vegetation is undertaken within 400 m of nesting sites
- requiring that all rehabilitation areas be reinstated to the pre-disturbed state and monitored for an appropriate period of time to ensure establishment and long-term sustainability.

6.4.4.3.5 Coordinator-General's conclusion: black-throated finch

The EIS has satisfactorily considered the potential impacts that the project could have on the BTF.

The project is expected to result in an SRI to the BTF. Conditions to the Commonwealth Minister for the Environment are recommended in this report (Appendix 3) requiring a SMP be developed and implemented for the BTF, and that an appropriate biodiversity offset is delivered for impacts to BTF habitat.

In consideration of the proposed mitigation and management measures, proponent commitments, the draft BOMS and conditions recommended in this report, it is concluded that the proposed management actions are not inconsistent with the relevant recovery plan; and the impacts on the BTF are not unacceptable.

6.4.4.4 Night parrot

6.4.4.4.1 Background

The night parrot is listed as 'endangered' under the EPBC Act. The exact distribution of the species is unknown with few substantiated observations since 1935 from remote arid and semi-arid regions of Queensland. Despite numerous unverified sightings, several dedicated searches and public campaigns there have been only 2 areas (western Queensland and the Pilbara in Western Australia) where reliable records indicate that populations may persist.

Most habitat records are of Triodia (spinifex) grasslands and/or chenopod shrublands in the arid and semi-arid zones with roosting and nesting sites consistently reported as within clumps of dense vegetation, primarily old and large spinifex clumps. The species was not recorded within the study area during field surveys undertaken for the EIS; however, one patch of spinifex (Triodia longiceps) grassland (RE 1.5.2) suitable for nesting habitat was recorded 3.8 km west of the project corridor within Ballara Nature Refuge (the nature refuge). Patches of low value feeding habitat were also observed approximately 10 km south of the nature refuge.

A '*Potential Night Parrot Habitat Desktop Analysis'*[76] (provided within, and referred to as 'the EIS') was undertaken by Leseberg, Healy and Murphy (NRM Adaptive) in 2021 to further assess the potential for the occurrence of the night parrot and suitable habitat along the project corridor, with the results of this analysis providing for the basis of the suitable night parrot roosting and foraging habitat mapped. The EIS concluded suitable habitat does occur within the study area which could support the night parrot, as shown in Figure 6.14.

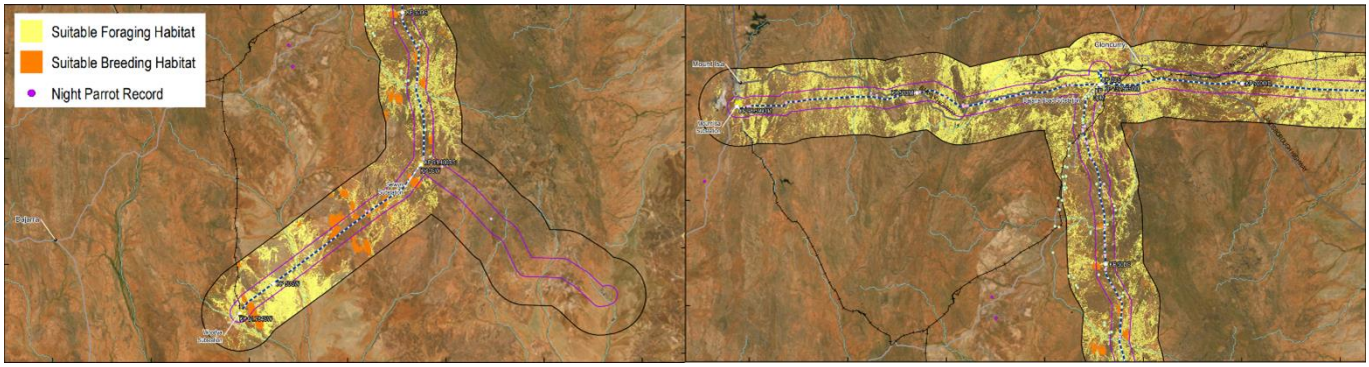

Figure 6.14 Records and distribution of suitable habitat for the Night parrot within the study area

[76] Revised draft EIS, Volume 4, Attachment F, available via: https://eisdocs.dsdip.qld.gov.au/CopperString/2022/Final%20EIS/Desktop%20analysis.PDF.

6.4.4.4.2 Recovery plans, conservation advice and threat abatement

There is no specific recovery plan for this species. The species has an approved conservation advice: *Approved Conservation Advice for Pezoporus occidentalis (Night parrot)*.[77]

Due to the cryptic nature of the species, key threats to the decline of species listed in the conservation advice relevant to the project are assumed only and include:

- habitat loss through clearing
- collision with fencing
- predation by feral animals (i.e. cats and foxes)
- soil disturbance, erosion and loss, degradation of habitat around water points and competition for food caused by feral herbivores
- increased fire events, human and non-human induced, leading to loss of roosting/nesting habitat.

Relevant priority recovery and threat abatement actions listed in the conservation advice and draft referral guidelines include:

- avoiding habitat clearance
- avoiding or minimising the use of fencing in areas likely to be traversed by the species, or alternatively construct fences in a manner that avoids or minimises risks
- eliminating or minimising key threats (such as cats and foxes) at known sites
- implementing fire management to supress fires in habitat.

The night parrot is listed as a species that may be adversely affected by pest animal species in the following TAPs:

- *Threat abatement plan for competition and land degradation by rabbits*[78]
- *Threat abatement plan for predation by feral cats*
- *Threat abatement plan for predation by the European red fox.*

6.4.4.4.3 Impacts and mitigation

Potential impacts of the project on the night parrot identified in the EIS and the desktop analysis include:

- the short-term risk to long-term stable roost sites, which are also critical for breeding, as a result of disturbance to the species during construction of the project, and
- the ongoing risk to night parrot due to collision with the transmission powerlines
- disturbance and displacement through noise, vibration and lighting.

Clearance of habitat

The EIS indicates important potential habitat areas for the night parrot are located from Cloncurry south to Selwyn (refer to Figure 6.15) and from Selwyn south-west to the Phosphate Hill mine (refer to Figure 6.16) within the project corridor. Due to the topography (rugged and rock range country with

[77] Commonwealth of Australia, Approved Conservation Advice for Pezoporus occidentalise (Night parrot), Department of the Environment, Canberra, 2016. Viewed May 2022, **http://www.environment.gov.au/biodiversity/threatened/species/pubs/59350-conservation-advice-15072016.pdf**

[78] Commonwealth of Australia, Threat abatement plan for competition and land degradation by rabbits, Department of the Environment and Energy, Canberra, 2017. Viewed May 2022, **http://www.environment.gov.au/biodiversity/threatened/publications/tap/competition-and-land-degradation-rabbits-2016**.

significant tree and shrub cover) and lack of credible historical records, the sections of the project corridor from Cloncurry west to Mount Isa, or from Cloncurry to the east were considered unlikely to represent important potential habitat for the species.

As shown in Figure 6.16 the floodplain of the Burke River consists of the largest area of potential foraging habitat and is bordered by patches of potential suitable roosting habitat (long unburnt, open Triodia). The EIS concludes this area as the most likely within the project corridor to support the species.

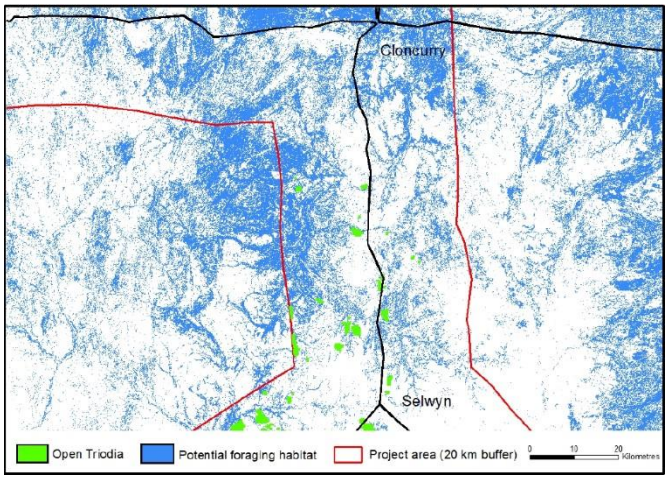

Figure 6.15 Alignment from Cloncurry south to Selwyn

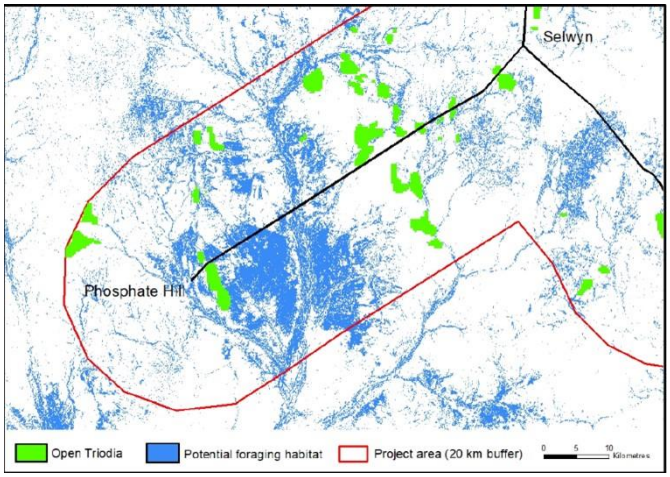

Figure 6.16 Alignment from Selwyn southwest to Phosphate Hill mine

The EIS estimates that the construction and operation of the project would result in a total clearance and/or disturbance of approximately 308.292 ha of potential foraging and roosting habitat for the night parrot. The EIS identifies that all habitat within the proximity of known records of the night parrot would be considered habitat critical to the survival of the species. However, as there no known records of the species within the project corridor, suitable habitat was not considered critical habitat. This conclusion is not accepted as it is considered that all potential foraging and roosting habitat is critical habitat for the night parrot.

The species is known to occupy long-term stable roost sites for several years either in a pair or a small group, and though they can move roost sites, rarely do. Due to the lack of information available regarding the significance of impact of construction activity in proximity to a roost site would represent to the species, the EIS considered any roost site within 1 km of the project corridor to be at risk of disturbance during construction.

Avoidance, mitigation, and management measures

The proponent has committed to undertake targeted surveys for the species prior to any clearing works, including the deployment of song meters to detect any individuals within proximity to construction sites. The EIS concludes where night parrots are not detected, it is unlikely the construction site (and 1 km buffer) include long-term, stable roost sites.

The proponent has committed to the preparation and implementation of a flora and vegetation management plan, traffic management plan, fauna management plan and a SMP as part of the CEMP, as detailed for the above for the koala. These would include measures that address the project's impacts on the night parrot, including a requirement for the proponent to conduct permanent monitoring of a site where a night parrot has been detected during construction and for a twelve-month period post-construction.

Risk of collision with powerlines

The night parrot is known to travel large distances between their roost site and foraging grounds at night, and while there is minimal evidence on flight heights, expert observations suggest the species is likely to reach heights well above ground level. The EIS notes that despite being a nocturnal species, the night parrot's lack of visual acuity and partiality to travel large distances at height during the night-time means that the species, if present, would be susceptible to collision with powerlines, causing injury or mortality.

The EIS concludes collision with powerlines within the section of the project corridor from Cloncurry south to Selwyn, as shown in Figure 6.15, is unlikely due to the suitable roosting and foraging habitat to the west of the alignment and low likelihood the species would cross to the suitable feeding habitat to the east. Suitable roosting and foraging habitat associated with the Burke River floodplain is located directly adjacent to the project corridor to the east and west, as shown in Figure 6.16, and would therefore represent an ongoing collision risk to the species as it crosses the alignment.

Avoidance, mitigation, and management measures

The desktop analysis recommends the proponent installs high visibility tags every 20 m and reflective tape to alert birds to the presence of powerlines and reduce the likelihood of collision within areas of suitable habitat. This report expects the proponent to implement these measures as part of their CEMP and OEMP.

Increased occurrence of weeds and pests

As the potential pest and weed impacts would be similar for the squatter pigeon, further discussion is provided in the assessment of impacts to the squatter pigeon in section 6.4.4.2.

Disturbance from noise, vibration and artificial lighting

The EIS considers that the night parrot would be susceptible to indirect impacts including noise, vibration and artificial lighting impacts mainly during construction for the project. As the potential impacts would be similar for all species, further discussion is provided in the assessment of impacts to the koala in section 6.4.4.1.

6.4.4.4.4 Significant residual impacts and offsets

The EIS did not consider the removal and/or disturbance of 308.292 ha of suitable habitat for the project would result in an SRI for the following reasons:

- the risk to the species is generally considered to be associated with the potential for direct impacts on the species rather than a loss of habitat
- habitat connectivity would be maintained by the natural revegetation of ground cover and microhabitats and through restrictive clearing (i.e. selective removal of trees)
- no indication that there is habitat critical to the breeding cycle of an important population
- targeted pre-surveys will further minimise impact on breeding or nesting habitat through micro-siting
- any roost site within 1 km of the alignment is at risk of disturbance due to a construction activity. If the species are not detected, it is very unlikely the site represents a long-term stable roost site.

Based on the information provided, this report does not agree with the SRI area presented in the EIS for the night parrot. A larger SRI area is concluded by this report due to the following key considerations:

- a conservative, precautionary approach has been taken in estimating whether clearing impacts should be considered an SRI

- clearing of vegetation for construction and operation of the project would result in an instant loss of critical habitat
- natural rehabilitation to pre-disturbance quality can take a considerable period of time based on climatic and substrate factors and continuing pressures from the operational use of the area
- temporary and permanent project activity impact areas have been considered cumulatively along the entire 1,000 km project corridor.

This report considers that the clearance of 308.292 ha of potential habitat for the night parrot for the project activities outlined in Table 6.8 may result in an SRI to the species requiring offsets, and if so, require the provision of biodiversity offsets under the EPBC Act.

Table 6.8 Significant residual impact total for the night parrot

Habitat type	Temporary project activity – construction (ha)	Permanent project activity – operation (ha)	Total
Foraging	132.687	63.040	195.727
Breeding	84.415	28.150	112.565
			308.292

Since acceptance of the final EIS, the proponent has provided updated draft BOMS that reflects the SRI area totals for this species as identified in Table 6.8. These SRI area totals are considered by this report to be the maximum acceptable for this project. Updated SRI areas for each stage of construction would be confirmed through pre-clearance surveys and during detailed design, prior to commencement of clearing for the relevant stage. The actual SRI would then be confirmed by a post-construction audit.

The updated draft BOMS identified where suitable offsets for this species may be provided, subject to confirmation of actual SRI impact areas. Reporting on actual SRI areas must include quality scoring for the impacted areas, to determine ultimate offset obligation in line with the EPBC Act assessment guide and calculator. Potential offset properties have been identified in the updated draft BOMS that would provide for offset of SRIs along the whole project.

This report includes recommended conditions for the Commonwealth Minister for the Environment (Appendix 3):

- defining maximum night parrot habitat disturbance limits and requirements for the proponent to provide offsets for the SRI for the night parrot
- requiring that a SMP be prepared for the night parrot. The plan must align with the EPBC Act requirements, recovery plan, conservation advice and any relevant TAP. The SMP also includes a requirement for the proponent to:
  - install high visibility and reflective tape at suitable intervals along the transmission line where it passes through areas of suitable night parrot habitat
  - undertake permanent monitoring of any site where a night parrot is detected for the duration of construction and for a twelve-month period post-construction
- requiring that all rehabilitation areas be reinstated to the pre-disturbed state and monitored for an appropriate period of time to ensure establishment and long-term sustainability.

6.4.4.4.5 Coordinator-General's conclusion: night parrot

The EIS has satisfactorily considered the potential impacts that the project could have on the night parrot.

The project is expected to result in an SRI to the night parrot. Conditions to the Commonwealth Minister for the Environment are recommended in this report (Appendix 3) requiring a SMP be developed and implemented for the night parrot, and that an appropriate biodiversity offset is delivered for impacts to night parrot habitat.

In consideration of the proposed mitigation and management measures, proponent commitments, the draft BOMS and conditions recommended in this report, it is concluded that the approved conservation advice for this species has been considered; the proposed management actions are not inconsistent with the relevant conservation advice; and the impacts on the night parrot are not unacceptable.

6.4.4.5 Australian painted snipe

6.4.4.5.1 Background

The Australian painted snipe is listed as 'endangered' under the EPBC Act. The distribution of the species is considered widespread and not limited to a geographic distribution and has been recorded at wetlands in all states of Australia. The EIS states the species preferred habitat includes the fringe of a wide variety of permanent and/or temporary shallow, brackish and freshwater wetlands.

The species was not observed during surveys undertaken for the current EIS nor the previous EIS; however, the EIS indicates the species has been previously recorded within the project corridor. All areas of wetlands (lacustrine or palustrine) from Hughenden west to Mount Isa, and south of Cloncurry are considered potential suitable habitat for the species.

6.4.4.5.2 Recovery plans, conservation advice and threat abatement

There is no recovery plan or TAP relevant for the species. The species has an approved conservation advice: *Approved Conservation Advice for Rostratula australis (Australian painted snipe)*.[79] Key threats to this species identified in the conservation advice relevant to the project include:

- loss and degradation of wetlands
- predation by foxes and feral cats
- replacement of native wetland vegetation by invasive weeds.

Key priority recovery and threat abatement actions include:

- ensuring there is no disturbance in known habitat areas, particularly where the species is known to breed
- controlling and managing access on private land and other land tenure
- managing any changes to hydrology that may cause changes to water table levels, runoff, salinity, algal blooms, sedimentation or pollution
- managing any other known, potential or emerging threats including inappropriate fire regimes and infrastructure development, weeds (i.e. parkinsonia (*Parkinsonia aculeata*)), predation from foxes and feral cats.

[79] Commonwealth of Australia, Approved Conservation Advice for Rostratula australis (Australian painted snipe), Department of Sustainability, Environment, Water, Population and Communities, Canberra, 2013. Viewed May 2022, http://www.environment.gov.au/biodiversity/threatened/species/pubs/77037-conservation-advice.pdf.

6.4.4.5.3 Impacts and mitigation

Direct clearance of habitat

The EIS indicates that there are no wetlands of national or international importance within the project corridor and broader locality, and all major wetlands and waterbodies representative of potential foraging habitat have been avoided through concept design. Construction within wetland areas may pose construction methodology complications, such as waterlogged soils and machinery access.

Based on the information in the EIS, the project may result in a total clearance and/or disturbance of approximately 234.135 ha (168.77 ha for construction and 65.37 ha for operation) of potential suitable habitat for the Australian painted snipe associated with ephemeral watercourses.

It is considered that the distribution of the Australian painted snipe within the project corridor is non-uniform and concentrated around areas with adequate water availability. As a nomadic species, the EIS concludes that the local population of the species would already transition to sites outside of the project corridor and therefore the project is unlikely to fragment an existing population into 2 or more populations.

No known roosting sites have been recorded within the project corridor and the EIS argued that the extent of foraging habitat removal is unlikely to impact on the breeding success of the species. This report is not satisfied with this conclusion, as these areas would still provide breeding habitat for the species and the loss of these areas may be significant.

It is acknowledged that important areas for the Australian painted snipe in the past have included the Murray-Darling Basin (preferred habitat for breeding), Queensland Channel Country and Fitzroy Basin of Central Queensland. Despite the project corridor not being located within any of these known important areas, it is considered that the preservation of all wetland habitat suitable for breeding as critical to the species' survival.

Avoidance, mitigation and management measures

The proponent has committed to the preparation and implementation of a flora and vegetation management plan, traffic management plan, fauna management plan and a SMP as part of the CEMP, as detailed for the koala in section 6.4.4.1, and would include measures that address the project ’s impacts on the Australian painted snipe. Pre-clearance surveys undertaken during the detailed design phase will identify the location of suitable habitat for the species which the proponent has committed to clearly marked as ‘no-go’ zones to ensure these areas are avoided where possible in accordance with measures outlined the flora and vegetation management plan.

Indirect habitat degradation

The EIS indicates that construction of the project may lead to a reduction in habitat quality because of localised dust, erosion, run-off and sedimentation caused by vegetation clearing works, increased vehicle movements and earthworks. The project corridor is also noted to intersect landscape already experiencing high levels of erosion and sedimentation attributable to existing land clearing, grazing activities and degradation by invasive weed species.

Any adverse weather conditions (i.e. high rainfall, strong winds) experienced during the construction phase may exacerbate the potential impact of erosion and sedimentation particularly in locations where topsoil is exposed following the removal of vegetation.

Sediment runoff is proposed to be managed through the rehabilitation of temporary construction sites as soon as practicable to establish ground cover and limit the duration that disturbed ground surfaces are exposed to erosive processes, as discussed in section 6.4.4.1 for the koala.

Avoidance, mitigation and management measures

The proponent has committed to the preparation and implementation of an erosion and sediment control plan for the project, which would include measures to avoid, manage or mitigate potential risk to soils, including specific reference to management/mitigation of risks associated with salinity.

To further minimise dust, erosion, run-off and sedimentation impacts during construction and operation, the proponent has committed to implement the following mitigation measures:

- where possible, construction would be undertaken during periods of minimal rainfall when ephemeral watercourses are dry reducing the potential for downstream impacts
- weather conditions would be monitored, and temporary controls established; all construction activities will cease where weather conditions have the potential to distribute dust or increase run-off and sedimentation
- dust suppression would be undertaken regularly and monitored for effectiveness
- the duration of in-stream works will be minimised, and existing waterway crossings would be utilised as a priority
- stabilisation of disturbed areas would be undertaken after disturbance with priority given to areas of steeper gradient.

Increased occurrence of weeds and pests

Foxes and feral cats have been identified as threats to the Australian painted snipe and were recorded within the study area during the survey effort undertaken for the EIS. Buffel grass was also recorded within the study area and is known to contribute to the habitat degradation of wetland habitat.

As the potential pest and weed impacts would be similar for the squatter pigeon, further discussion is provided in the assessment of impacts to the squatter pigeon in section 6.4.4.2.

Disturbance from noise, vibration and artificial lighting

The EIS considers that the Australian painted snipe would be susceptible to indirect impacts including noise, vibration and artificial lighting impacts mainly during construction for the project. As the potential impacts would be similar for all species, further discussion is provided in the assessment of impacts to the koala in section 6.4.4.1.

6.4.4.5.4 Significant residual impacts and offsets

The EIS did not consider the removal and/or disturbance of 234.135 ha of suitable habitat for the project would result in an SRI for the following reasons:

- all wetland habitats will be avoided or spanned, with all major wetlands and waterbodies with the potential to provide foraging habitat avoided through corridor selection, including infrastructure/activity placement
- the distribution of the species in the study area is non-uniform and concentrated around areas with adequate available water and the project corridor has been selected to avoid the majority of these areas
- indirect degradation of ephemeral water bodies that may impact habitat of the Australian painted snipe will be mitigated through the implementation of an erosion and sediment control plan
- habitat in the project corridor is not considered a known roosting site/s

- implementation of weed management practices and pest fauna control measures may serve as a benefit for the species.

Until detailed design and certainty of the location of project infrastructure/activities, the extent of loss and degradation to wetland habitats (to be spanned or avoided) is unknown within riparian zones along the project corridor.

Based on the information provided, this report does not agree with the SRI area presented in the EIS for the Australian painted snipe. A conservative approach has been taken and the report considers that the cumulative clearance of 219.153 ha of Australian painted snipe suitable habitat for all project activities (excluding conductor zone clearing), outlined in Table 6.9, may result in an SRI to the species and would require biodiversity offsets under the EPBC Act. Clearing within the conductor clearance zone will allow for all vegetation below 3.5 m to be retained.

Table 6.9 Significant residual impact totals for the Australian painted snipe

Habitat type	Temporary project activity – construction (ha)	Permanent project activity – operation (ha)	Total
Riparian zone	168.765	50.388	**219.153**

Since acceptance of the final EIS, the proponent has provided updated draft BOMS that reflects the SRI area totals for this species as identified in Table 6.9. These SRI area totals are considered by this evaluation report to be the maximum acceptable for this project. Updated SRI areas for each stage of construction would be confirmed through pre-clearance surveys and during detailed design, prior to commencement of clearing for the relevant stage. The actual SRI would then be confirmed by a post-construction audit.

The updated draft BOMS identified where suitable offsets for this species may be provided, subject to confirmation of actual SRI impact areas. Reporting on actual SRI areas must include quality scoring for the impacted areas, to determine ultimate offset obligation in line with the EPBC Act assessment guide and calculator. Potential offset properties have been identified in the updated draft BOMS that would provide for offset of SRIs along the whole project.

This report includes recommended conditions to the Commonwealth Minister for the Environment (Appendix 3):

- defining maximum Australian painted snipe habitat disturbance limits and requirements for the proponent to provide offsets for the SRI for the Australian painted snipe
- requiring that a SMP be prepared for the Australian painted snipe. The plan must align with the EPBC Act requirements, recovery plan, conservation advice and any relevant TAP
- requiring that all rehabilitation areas be reinstated to the pre-disturbed state and monitored for an appropriate period of time to ensure establishment and long-term sustainability.

Post detailed design, updated impact figures and offset calculations to determine the offset obligation would need to be updated to reflect what habitat will be impacted.

6.4.4.5.5 Coordinator-General's conclusion: Australian painted snipe

The EIS has satisfactorily considered the potential impacts that the project could have on the Australian painted snipe.

The project is expected to result in an SRI to the Australian painted snipe. Conditions to the Commonwealth Minister for the Environment are recommended in this report (Appendix 3) requiring a

SMP be developed and implemented for the Australian painted snipe, and that an appropriate biodiversity offset is delivered for impacts to Australian painted snipe habitat.

In consideration of the proposed mitigation and management measures, proponent commitments, the draft BOMS and conditions recommended in this report, it is concluded that the approved conservation advice for this species has been considered; the proposed management actions are not inconsistent with the conservation advice; and the impacts on the Australian painted snipe are not unacceptable.

6.4.4.6 Painted honeyeater

6.4.4.6.1 Background

The painted honeyeater is listed as 'vulnerable' under the EPBC Act. The species inhabits mistletoes in eucalypt forests/woodlands, riparian woodlands of black box and river red gum, box-ironbark-yellow gum woodlands, acacia dominated woodlands, paperbarks, casuarinas, *Callitris* and trees on farmland or gardens. The species feeds almost exclusively on mistletoe fruit and flowers which are in higher abundance in woodland areas with a high number of mature trees and is known to nest where mistletoe is readily available.

The project corridor is located near the northern extent of the range of the painted honeyeater. The species was not recorded within the study area during field surveys undertaken as part of the EIS assessment, however, suitable habitat was identified within all remnant regional ecosystem vegetation west of Charters Towers, as shown in Figure 6.17. A high abundance of mistletoe was also recorded within the Renewable Energy Hub section highlighted in the green box in Figure 6.17.

Figure 6.17 Records and distribution of suitable habitat for the painted honeyeater within the study area

6.4.4.6.2 Recovery plans, conservation advice and threat abatement

There is no recovery plan or TAP relevant for the species. The species has an approved conservation advice: *Approved Conservation Advice for Grantiella picta (Painted honeyeater)*.[80] Key threats to this species identified in the conservation advice relevant to the project include:

- ongoing clearance and fragmentation of habitat for agriculture or development
- collision with road vehicles
- predation from invasive species (e.g. black rats) and competition with other bird species.

Key priority recovery and threat abatement actions include:

- ensuring no further clearance of suitable habitat and protecting all woodland from clearing in which the species have been regularly sighted including remnant roadside vegetation and regrowth
- promoting management of woodland remnants and regrowth, including the maintenance of adequate populations of mature trees and trees that host the mistletoe species
- promoting revegetation and land reclamation that recreates woodland habitat.

6.4.4.6.3 Impacts and mitigation

Direct impacts - clearance of habitat

The EIS estimated that the construction and operation of the project would result in the clearance and/or disturbance of approximately 1,639.9 ha (1,131.77 ha for construction and 508.13 ha for operation) of potential painted honeyeater foraging habitat.

The EIS indicated that the habitat within the project corridor is not critical habitat for the species, and that there is no breeding habitat impacted by the project as records of breeding for the species are generally 400 km or more south of the project corridor. The EIS determined there is suitable habitat (particularly eucalypt woodland and open forest) available within the greater region and therefore considers that vegetation clearing required to be undertaken for the project would not significantly impact the painted honeyeater.

This report acknowledges that the conservation advice indicates the species is becoming increasingly uncommon in north-west Queensland and under current trends may become extinct or absent from the extremes of its northern distribution. Therefore, this report considers that the project may have an SRI on foraging habitat that may be used by the species, due to the loss of mature trees and canopy cover.

This report does not agree with the assumption that no habitat critical to the survival of the species is intersected by the project corridor. As there is potential habitat in the area for the painted honeyeater, this may be a potential impact for the species. It is also considered that the species may use areas of eucalypt woodland and open forest with mistletoe growing on them for breeding.

Avoidance, mitigation, and management measures

The proponent has committed to the preparation and implementation of a flora and vegetation management plan, traffic management plan, fauna management plan and a SMP as part of the CEMP, as detailed for the koala, and would include measures that address the project's impacts on the painted honeyeater.

[80] Commonwealth of Australia, Approved Conservation Advice for Grantiella picta (Painted honeyearter), Department of Environment, Canberra, 2015. Viewed May 2022, http://www.environment.gov.au/biodiversity/threatened/species/pubs/470-conservation-advice.pdf.

To further minimise vegetation clearance impacts, the proponent has committed to undertake pre-clearance surveys during the detailed design phase which would distinguish areas of woodlands with high abundances of mistletoes and areas with no mistletoes. Those areas with high abundances of mistletoes or with an abundance of mature eucalypts able to host mistletoes would be avoided through micro-siting.

Impacts - fragmentation of habitat/barrier to movement and increased risk of vehicle strike

The EIS considered that project would not result in fragmentation of the painted honeyeater population into 2 or more populations nor restrict species movement given no physical barriers (i.e. fencing) would be constructed along the project corridor (excluding individual substation and CEV hut sites). The EIS anticipates the species would continue to utilise the project corridor without restriction following the completion of construction.

The painted honeyeater is specifically susceptible to mortality or injury during construction works because of clearing activities, including an increase in traffic movements and associated vehicle collision. The proponent proposes to flush areas of potential habitat immediately prior to clearing (i.e. spotter-catcher to walk in front of clearing machinery) to allow dispersion from construction sites ahead of machinery.

Avoidance, mitigation, and management measures

To limit fragmentation and reduced habitat connectivity and minimise vehicle collision, the proponent has committed to implement mitigation measures during construction and operation as part of the CEMP and OEMP, as discussed in section 6.4.4.1 for the koala.

Increased occurrence of weeds and pests

The black rat and rabbit have been identified as threats to the painted honeyeater. The EIS indicated the black rat has been historically recorded within the study area and are renowned bird predators, preying on their eggs and young (nest predation). While rabbits pose a threat through competition for food resources and through contributing to the degradation of habitat for the painted honeyeater, rabbits have not been observed within the study area.

As the potential pest and weed impacts would be similar for the squatter pigeon, further discussion is provided in the assessment of impacts to the squatter pigeon in section 6.4.4.2.

Disturbance from noise, vibration and artificial lighting

The EIS considers that the painted honeyeater would be susceptible to indirect impacts including noise, vibration and artificial lighting impacts mainly during construction for the project. As the potential impacts would be similar for all species, further discussion is provided in the assessment of impacts to the koala in section 6.4.4.1.

6.4.4.6.4 Significant residual impacts and offsets

The EIS did not consider that the removal and/or disturbance of 1,639.9 ha of suitable habitat for the project would result in an SRI for the following reasons:

- potential habitat for the species is continuous with the surrounding landscape, with distribution largely dictated by the presence of mistletoe (favoured feeding resource)
- temporarily disturbed areas will naturally revegetate to grassland upon completion of construction with woody vegetation expected to return longer term to re-inhabit the tree canopy

- the project is unlikely to lead to a decrease in the extent of occurrence of the painted honeyeater nor lead to a long-term decrease in the size of any populations of the species that may visit the project corridor
- habitat intersected by the project is not considered habitat critical to the survival of the species.

Based on the information provided, this report does not agree with the SRI area presented in the EIS for the painted honeyeater. A conservative approach has been taken and the report considers that the cumulative clearance of 945.57 ha of painted honeyeater suitable habitat for all project activities (excluding conductor zone clearing), outlined in Table 6.10, may result in an SRI to the species and would require biodiversity offsets under the EPBC Act. Clearing within the conductor clearance zone will allow for all vegetation below 3.5 m to be retained.

Table 6.10 Significant residual impact totals for the painted honeyeater

Habitat type	Temporary project activity – construction (ha)	Permanent project activity – operation (ha)	Total
Foraging/breeding	688.21	257.36	**945.57**

Since acceptance of the final EIS, the proponent has provided updated draft BOMS that reflects the SRI area totals for this species as identified in Table 6.10. These SRI area totals are considered by this report to be the maximum acceptable for this project. Updated SRI areas for each stage of construction would be confirmed through pre-clearance surveys and during detailed design, prior to commencement of clearing for the relevant stage. The actual SRI would then be confirmed by a post-construction audit.

The updated draft BOMS identified where suitable offsets for this species may be provided, subject to confirmation of actual SRI impact areas. Reporting on actual SRI areas must include quality scoring for the impacted areas, to determine ultimate offset obligation in line with the EPBC Act assessment guide and calculator. Potential offset properties have been identified in the updated draft BOMS that would provide for offset of SRIs along the whole project.

This report includes recommended conditions to the Commonwealth Minister for the Environment (Appendix 3):

- defining maximum painted honeyeater habitat disturbance limits and requirements for the proponent to provide offsets for the SRI for the painted honeyeater
- requiring that a SMP be prepared for the painted honeyeater. The plan must align with the EPBC Act requirements, recovery plan, conservation advice and any relevant TAP
- requiring that all rehabilitation areas be reinstated to the pre-disturbed state and monitored for an appropriate period of time to ensure establishment and long-term sustainability.

Post detailed design, updated impact figures and offset calculations to determine the offset obligation would need to be updated to reflect what habitat will be impacted.

6.4.4.6.5 Coordinator-General's conclusion: painted honeyeater

The EIS has satisfactorily considered the potential impacts that the project could have on the painted honeyeater.

The project is expected to result in an SRI to the painted honeyeater. Conditions to the Commonwealth Minister for the Environment are recommended in this report (Appendix 3) requiring a SMP be developed and implemented for the Australian painted snipe, and that an appropriate biodiversity offset is delivered for impacts to painted honeyeater habitat.

In consideration of the proposed mitigation and management measures, proponent commitments, the draft BOMS and conditions recommended in this report, it is concluded that the approved conservation advice for this species has been considered; the proposed management actions are not inconsistent with the conservation advice; and the impacts on the painted honeyeater are not unacceptable.

6.4.4.7 Julia Creek dunnart

6.4.4.7.1 Background

The Julia Creek dunnart is listed as 'vulnerable' under the EPBC Act. The species is endemic to north-western Queensland, where it occurs in areas within the Mitchell Grass Downs and Desert Uplands bioregions associated with tussock Mitchell grasslands on cracking clay soils.

The species was not recorded within the study area during field surveys undertaken as part of the EIS assessment, though has been historically recorded within cracking clay pastures surrounding Julia Creek. Suitable habitat was identified within the CopperString Core section of the project corridor, as shown in Figure 6.18, supported by 646 Wildlife Online records, 3 Queensland Museum records and 2 recordings from 2010/2011 surveys undertaken as part of the previous EIS process.

Habitat type where the Julia Creek dunnart could potentially occur within the project corridor includes REs 4.3.14, 4.3.15, 4.3.19, 4.3.20, 4.9.1, 4.9.5, 4.9.7, 4.9.8, 2.3.3 and 2.9.1.

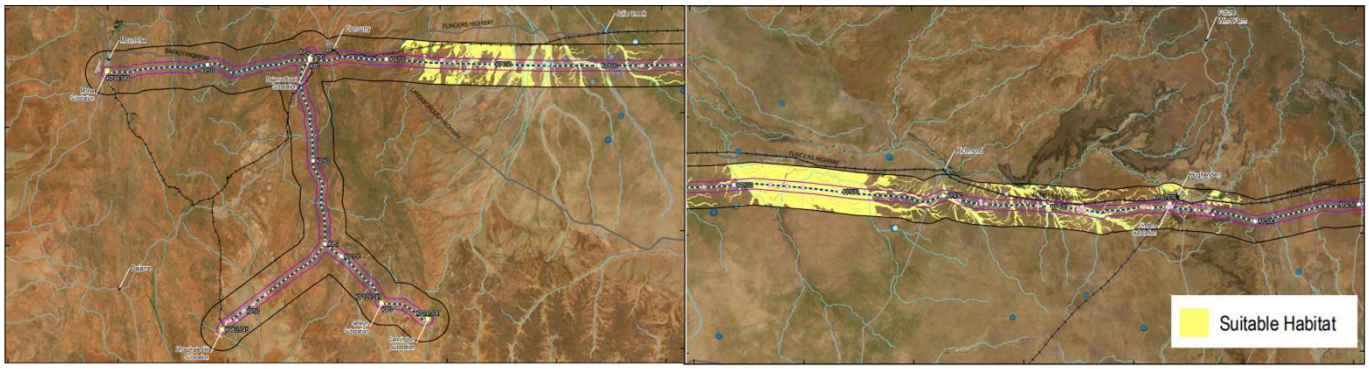

Figure 6.18 Records and distribution of suitable habitat for the Julia Creek dunnart within the study area

6.4.4.7.2 Recovery plans, conservation advice and threat abatement

The species has both an approved conservation advice: *Approved Conservation Advice for Sminthopsis douglasi (Julia Creek dunnart)*[81] and a national recovery plan: *National recovery plan for the Julia Creek dunnart (Sminthopsis douglasi)*.[82]

Key threats to this species identified in the conservation advice and recovery plan relevant to the project include:

- habitat degradation and resource depletion by feral herbivores (e.g. sheep) and weed invasion (e.g. prickly acacia and other woody weeds)
- inappropriate fire regimes
- predation from feral cats and foxes.

[81] Commonwealth of Australia, Approved Conservation Advice for Sminthopsis douglasi (Julia Creek dunnart), Department of Environment and Energy, Canberra, 2016. Viewed May 2022, http://www.environment.gov.au/biodiversity/threatened/species/pubs/305-conservation-advice-07122016.pdf

[82] Commonwealth of Australia, National recovery plan for the Julia Creek dunnart (Sminthopsis douglasi), Department of the Environment, Water, Heritage and the Arts, Canberra, 2009. Viewed May 2022, http://www.environment.gov.au/biodiversity/threatened/publications/recovery/juliacreek-dunnart.

Key priority recovery and threat abatement actions include:

- maintaining the extent and density of grass cover in habitat areas
- continuing and expanding implementation of pest animal (e.g. feral cats) and plant control programs.

The following TAPs are relevant to the species:

- Threat abatement plan for predation by feral cats
- Threat abatement plan for predation by the European red fox.

6.4.4.7.3 Impacts and mitigation

Direct impacts - clearance of habitat

The EIS estimated that the construction and operation of the project would result in a total clearance and/or disturbance of approximately 243.87 ha (184.27 ha for construction and 59.6 ha for operation) of potential breeding and foraging habitat for the Julia Creek dunnart. The EIS identified that breeding habitat consisting of tussock Mitchell Grass grasslands on cracking clay soils habitat within the project corridor is critical habitat for the species.

Construction of the project is expected to be undertaken predominately during the dry season (autumn/winter), the period in which the Julia Creek dunnart shelters within cracks in the soil. After rain periods when soil cracks close, the species shelters under vegetation as an alternative. During construction, earthworks would impact the integrity of the soil crack networks through the compaction of soil and further prevent the natural process of cracking and/or drying. The loss of or stripping of topsoil can also alter flora diversity and abundance for vegetative shelter for the species. The EIS indicated pre-clearance surveys would be undertaken during the detailed design phase to distinguish areas of cracking clay soil and non-cracking clay soils to direct micro-siting of transmission towers and associated infrastructure to avoid areas with a high density of deep cracking clay.

As a nocturnal species which shelters in ground habitat during the day, the Julia Creek dunnart is specifically susceptible to mortality or injury during construction works because of clearing activities, including an increase in traffic movements. The proponent has committed to identify the location of breeding habitat for the species through pre-clearance surveys which will be clearly marked as ‘no-go’ zones for construction activities to ensure these areas are avoided where possible.

The proponent has committed to the preparation and implementation of a flora and vegetation management plan, traffic management plan, fauna management plan and a SMP as part of the CEMP, as detailed for the koala, and would include measures that address the project’s impacts on the Julia Creek dunnart.

Impacts on fragmentation of habitat/barrier to movement

To limit fragmentation and reduced habitat connectivity, the proponent has committed to implement mitigation measures during construction and operation as part of the CEMP and OEMP, as discussed in section 6.4.4.1 for the koala.

Increased occurrence of weeds and pests

The nature of the project as a long linear corridor is likely to facilitate the spread of feral cats and foxes, key predators for the Julia Creek dunnart, and subsequently increase predation pressures on threatened species. Prickly acacia was recorded within the study area in high densities and is out-competing understorey plants and changing the structure of the habitat required by the Julia Creek dunnart with more than 7 million hectares of the Mitchell Grasslands infested within Queensland.

In Queensland, the European red fox is a Category 3, 4, 5 and 6 restricted matter; the feral cat is a Category 3, 4, and 6 restricted matter and prickly acacia is a Category 3 restricted matter under the Queensland *Biosecurity Act 2014.* Under this Act, landowners have a 'general biosecurity obligation' to take all reasonable and practical steps to minimise the risks associated with invasive plants and animals on a person's land.

As the potential pest and weed impacts would be similar for the squatter pigeon, further discussion is provided in the assessment of impacts to the squatter pigeon in section 6.4.4.2.

Increased fire risk

Fire could start as a result of sparks from machinery, accidents, collision between vegetation and transmission lines, the maloperation or failure of transmission infrastructure components and the spread or extent of invasive weed species. The project may cause fires to expand into a variety of habitats across the project corridor; however, this report accepts the conclusion that the transmission easement may act as a fire break and subsequently limit the capacity of fires to burn out entire areas of habitat.

The proponent is proposing to develop and implement an emergency management plans and bushfire management plans for the construction and operation of the project, which would include emergency procedures to be followed in the event of a fire and measures to address the risk of bushfire. The proponent would undertake measures to exclude fire from the site, including fire breaks (i.e. vegetation management), warning systems and appropriate storage and handling of flammable chemicals and materials.

Disturbance from noise, vibration and artificial lighting

As a nocturnal species, the EIS considers that the Julia Creek dunnart would be susceptible to indirect impacts including noise, vibration and artificial lighting impacts mainly during construction for the project. As the potential impacts would be similar for all species, further discussion on these impacts is provided in the assessment of impacts to the koala in section 6.4.4.1.

6.4.4.7.4 Significant residual impacts and offsets

The EIS did not consider the removal and/or disturbance of 243.87 ha of suitable habitat for the project would result in an SRI for the following reasons:

- given local prevalence of habitat, any local habitat loss is unlikely to have significant impact on local or regional availability of habitat
- micro-siting of infrastructure to avoid areas of high microhabitat value will reduce potential for direct mortality of individuals and ensure impacts to potential suitable breeding habitat is minimised (high density of cracking clays)
- locations where this species occurs within the project corridor is currently used for cattle grazing, and exotic species are already present.

This report considers access tracks used during construction and operations would result in an increase in the loss of habitat for shelter sites by compacting soil cracks. Insufficient evidence has been provided to ensure that construction access tracks would return to pre-construction status.

Based on the information provided, this report does not agree with the SRI presented in the EIS for the Julia Creek dunnart. A conservative approach has been taken and the report considers that the cumulative clearance of 243.28 ha of Julia Creek dunnart suitable habitat for the project activities outlined in Table 6.11 may result in an SRI to the species and would require biodiversity offsets under the EPBC Act.

Table 6.11 Significant residual impact totals for the Julia Creek dunnart

Habitat type	Temporary project activity – construction (ha)	Permanent project activity – operation (ha)	Total
Mitchell grasslands	146.29	47.22	193.51
Riparian	37.98	11.79	49.77
			243.28

Since acceptance of the final EIS, the proponent has provided updated draft BOMS that reflects the SRI area totals for this species as identified in Table 6.11. These SRI area totals are considered by this report to be the maximum acceptable for this project. Updated SRI areas for each stage of construction would be confirmed through pre-clearance surveys and during detailed design, prior to commencement of clearing for the relevant stage. The actual SRI would then be confirmed by a post-construction audit.

The updated draft BOMS identified where suitable offsets for this species may be provided, subject to confirmation of actual SRI impact areas. Reporting on actual SRI areas must include quality scoring for the impacted areas, to determine ultimate offset obligation in line with the EPBC Act assessment guide and calculator. Potential offset properties have been identified in the updated draft BOMS that would provide for offset of SRIs along the whole project.

This report includes recommended conditions for the Commonwealth Minister for the Environment (Appendix 3):

- defining maximum Julia Creek dunnart habitat disturbance limits and requirements for the proponent to provide offsets for the SRI for the Julia Creek dunnart
- requiring that a SMP be prepared for the Julia Creek dunnart. The plan must align with the EPBC Act requirements, recovery plan, conservation advice and any relevant TAP
- requiring that all rehabilitation areas be reinstated to the pre-disturbed state and monitored for an appropriate period of time to ensure establishment and long-term sustainability.

6.4.4.7.5 Coordinator-General's conclusion: Julia Creek dunnart

The EIS has satisfactorily considered the potential impacts that the project could have on the Julia Creek dunnart.

The project is expected to result in an SRI to the Julia Creek dunnart. Conditions to the Commonwealth Minister for the Environment are recommended in this report (Appendix 3) requiring a SMP be developed and implemented for the Julia Creek dunnart, and that an appropriate biodiversity offset is delivered for impacts to Julia Creek dunnart.

In consideration of the proposed mitigation and management measures, proponent commitments, the draft BOMS and conditions recommended in this report, it is concluded that the approved conservation advice for this species has been considered; the proposed management actions are not inconsistent with the relevant recovery plan; and the impacts on the Julia Creek dunnart are not unacceptable.

6.4.4.8 Red goshawk

6.4.4.8.1 Background

The red goshawk is listed as 'vulnerable' under the EPBC Act. The species distribution is known to be patchy and vast across coastal and sub-coastal regions of northern and eastern Australia, though lack of recent sightings suggests the species range may have contracted to the north with a stronghold in north-east Queensland.

The species is largely a sedentary species (occupying the same territory throughout the year), with large home ranges of up to 200 km^2. The preferred foraging habitat for the species is semi-closed eucalypt woodlands, tall open forests, gallery rainforests, swamp sclerophyll forests and rainforest margins with a mosaic of vegetation types, large prey populations (birds), and in proximity to permanent water. Nesting is typically restricted to tall trees (more than 20 m tall) which are located within 1 km of a watercourse or wetlands.

The species (including nesting sites) was not recorded within the project corridor during field surveys undertaken as part of the EIS assessment. However, the EIS considered that the species has the potential to use the project corridor based on the existing records and the presence of suitable habitat within the most eastern and western extents of Renewable Energy Hub section of the project corridor to support foraging and nesting.

6.4.4.8.2 Recovery plans, conservation advice and threat abatement

The species has both an approved conservation advice: *Approved Conservation Advice for Erythrotriorchis radiatus (red goshawk)*.[83] and a national recovery plan: *National recovery plan for the red goshawk (Erythrotriorchis radiatus)*.[84] There is no TAP relevant for the species.

Key threats to this species identified in the conservation advice and recovery plan relevant to the project include:

- widespread clearance, degradation and fragmentation of habitat and/or loss of nesting sites for agriculture
- altered fire regimes including reduced fire frequencies leading to vegetation thickening and a reduction in habitat suitability
- changes in prey availability caused by the loss or degradation of freshwater wetlands, loss of hollow-bearing trees in which prey breed.

Key priority recovery and threat abatement actions include:

- protecting and managing species territories, including limiting access to known nest sites and reducing habitat fragmentation and degradation
- identifying important populations and nest localities and implementing monitoring programs
- identifying the extent of impact of habitat fragmentation on prey density and population persistency.

6.4.4.8.3 Impacts and mitigation

Direct impacts - clearance of habitat

The EIS estimated that the construction and operation of the project would result in the clearance and/or disturbance of approximately 164.5 ha (80.82 ha for construction and 83.7 ha for operation) of potential red goshawk foraging habitat. The EIS indicated that, subject to detailed design, riparian vegetation clearing for waterway crossings has been avoided and minimised as far as practicable through spanning, utilising existing crossings and/or cleared areas for access tracks and placement of transmission towers away from fringing vegetation.

---

[83] Commonwealth of Australia, Approved Conservation Advice for Erythrotriorchis radiatus (Red goshawk), Department of the Environment, Canberra, 2015. Viewed May 2022, **http://www.environment.gov.au/biodiversity/threatened/species/pubs/942-conservation-advice-31102015.pdf**

[84] Commonwealth of Australia, National recovery plan for the red goshawk (Erythrotriorchis radiatus), Department of Sustainability, Environment, Water, Population and Communities, Canberra, 2012. Viewed May 2022, **http://www.environment.gov.au/biodiversity/threatened/recovery-plans/national-recovery-plan-red-goshawk-erythrotriorchis-radiatus**.

All vegetation clearing would result in a more open vegetative structure for the species communities within and adjacent to the project corridor. As an ambush species, the EIS considers a more open canopy could reduce the species' ability to forage within and surrounding the project corridor. This report agrees with the argument in the EIS that due to the linear nature of the project over a large geographic range and the roaming nature of the species, the project would only result in very minor, localised loss of habitat. In total the project would have an impact on 0.488% of suitable habitat within a 2.5 km buffer of the project corridor. The species is expected to continue to utilise available foraging habitat surrounding the project corridor.

Despite the survey effort reporting a minimum number of trees suitable for breeding purposes throughout the project corridor, it is considered that any loss and/or disturbance to nesting sites would adversely reduce breeding success for the species. The EIS considered habitat critical to the survival of the species as breeding habitat. To address impacts to breeding habitat, the proponent has committed to undertake pre-clearance surveys to identify and avoid current and potential nesting sites within the clearance footprints by micro-siting infrastructure. Qualified fauna spotter-catchers will be present during pre-clearance surveys to further reduce the likelihood nest sites are not sighted.

Indirect impacts – noise, vibration and lighting pollution

The EIS considers that the red goshawk would be susceptible to indirect impacts including noise, vibration and artificial lighting impacts mainly during construction for the project. As the potential impacts would be similar for all species, further discussion is provided in the assessment of impacts to the koala in section 6.4.4.1.

6.4.4.8.4 Significant residual impacts and offsets

Based on the information provided in the EIS, this report considers the removal and/or disturbance of 164.5 ha of habitat would not result in an SRI as nesting sites are expected to be avoided entirely and there is substantive foraging habitat surrounding the immediate project corridor.

The species frequently inhabit areas where large and diverse bird populations occur, including the painted honeyeater and Australian painted snipe. Offsets required for these other bird species are expected to also protect potential habitat for the red goshawk, where the offsets are located within this species' range.

6.4.4.8.5 Coordinator-General's conclusion: red goshawk

The EIS has satisfactorily considered the potential impacts that the construction and operation of the project could have on the red goshawk. Proponent commitments and identified mitigation and management measures will minimise impacts to this species and offsets required for other threatened bird species are expected to also benefit this species.

6.4.4.9 Ornamental snake

6.4.4.9.1 Background

The ornamental snake is listed as 'vulnerable' under the EPBC Act. The species is known only to occur in the Brigalow Belt Bioregion and drainage systems of the Fitzroy and Dawson River catchments in Queensland and prefers woodlands and open forests associated with moist areas, particularly gilgai mounds and depressions in REs on land zone 4,[85] but also lake margins and wetlands.

[85] Land zone 4: clay plains.

The species was not recorded within the project corridor during field surveys undertaken as part of the EIS assessment; however, 4 Wildlife Online records and one Queensland Museum record indicated presence of the species within the study area. The project corridor and concept design has been selected to avoid these areas.

Suitable habitat was observed at 5 separate locations within the Renewable Energy Hub section between the Cape River and Campaspe River and CopperString Core section within belah and gidgee woodlands with scattered gilgais with a high abundance of groundcover.

6.4.4.9.2 Recovery plans, conservation advice and threat abatement

There is no specific recovery plan for this species, however the *Draft referral guidelines for the nationally listed Brigalow Belt reptiles is relevant*.[86]

The species has an approved conservation advice: *Approved Conservation Advice for Denisonia maculata (Ornamental Snake)*.[87]

Key threats to the species listed in the conservation advice relevant to the project include:

- habitat loss and fragmentation through clearing
- habitat degradation through overgrazing by stock, especially cattle, or grazing of gilgais during the wet season leading to soil compaction and compromised soil structure
- alteration of landscape hydrology and water quality in and around gilgai environments
- poisoning through cane toad ingestion
- predation by feral animals
- invasive weeds.

Relevant priority recovery and threat abatement actions listed in the conservation advice and draft referral guidelines include:

- avoiding habitat clearance
- maximising the establishment of reserves to protect suitable habitat and landscape connectivity, or implementation of buffer zones to protect areas of suitable habitat
- implementing habitat management and monitoring plans specific to the species
- identifying populations of high conservation priority and minimising adverse impacts from land use at known sites
- controlling key threats (such as introduced pests including pigs and cane toads) to manage threats at known sites and implement pest management plans
- monitoring construction works to check for trapped reptiles every 3 days
- implementing water management plans.

---

[86] Commonwealth of Australia, Draft Referral guidelines for the nationally listed Brigalow Belt reptiles, Department of Sustainability, Environment, Water, Population and Communities, Canberra, 2011. Viewed May 2022, **http://www.environment.gov.au/system/files/resources/570964ac-15bf-4e07-80da-848fead7b0cd/files/draft-referralguidelines-comment-brigalow-reptiles.pdf**

[87] Commonwealth of Australia, Approved Conservation Advice for Denisonia maculata (Ornamental Snake), Department of the Environment, Canberra, 2014. Viewed May 2022, **http://www.environment.gov.au/biodiversity/threatened/species/pubs/1193-conservation-advice.pdf**.

The ornamental snake is listed as a species that may be adversely affected by pest animal species in the following TAPs:

- *Threat abatement plan for the biological effects, including lethal toxic ingestion, caused by cane toads*
- *Threat abatement plan for predation by feral cats*
- *Threat abatement plan for predation by the European red fox*
- *Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs*.[88]

6.4.4.9.3 Impacts and mitigation

Direct impacts – clearance of habitat

The *Draft Referral Guidelines for the Nationally Listed Brigalow Belt Reptiles* states that clearance of 2 ha or more of 'important habitat' for the ornamental snake is considered to have a high risk of significant impact. 'Important habitat' for the ornamental snake is considered:

- habitat where the species has been identified during a survey
- near the limit of the species' known range
- large patches of contiguous, suitable habitat and viable landscape corridors (necessary for the purposes of breeding, dispersal or maintaining the genetic diversity of the species over successive generations)
- a habitat type where the species is identified during a survey, but which was previously thought not to support the species.

As patches of suitable habitat for the species were identified onsite during surveys, including gilgai areas (breeding habitat) or habitat linking gilgais, the habitat provided within the project corridor is considered 'important habitat'. The EIS estimates that the construction and operation of the project would result in a total clearance and/or disturbance of approximately 94.91 ha (52.9 ha for construction and 42 ha for operation) of potential habitat for the ornamental snake.

The proponent has committed to the preparation and implementation of a flora and vegetation management plan, traffic management plan, fauna management plan and a SMP as part of the CEMP, as detailed for the koala in section 6.4.4.1, and would include measures that address the project's impacts on the ornamental snake.

Increased occurrence of weeds and pests

Feral pigs, foxes and feral cats have been identified as threats to the ornamental snake and were all recorded within the study area during the survey effort. Cane toads, which pose a threat through toxic ingestion and mortality, were also identified throughout the project corridor and are predicted to already occupy suitable habitat for the species.

In Queensland, the European red fox is a Category 3, 4, 5 and 6 restricted matter and the feral cat and feral pig is a Category 3, 4, and 6 restricted matter under the Queensland *Biosecurity Act 2014*. Under

[88] Commonwealth of Australia, Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs (Sus scrofa), Department of the Environment and Energy, Canberra, 2017. Viewed May 2022, **http://www.environment.gov.au/system/files/resources/b022ba00-ceb9-4d0b-9b9a-54f9700e7ec9/files/tap-feral-pigs-2017.pdf**.

this Act, landowners have a ‘general biosecurity obligation’ to take all reasonable and practical steps to minimise the risks associated with invasive plants and animals on a person’s land.

As the potential pest and weed impacts would be similar for the squatter pigeon, further discussion is provided in the assessment of impacts to the squatter pigeon in section 6.4.4.2.

Indirect impacts – noise, vibration and lighting pollution

The EIS considers that the ornamental snake would be susceptible to indirect impacts including noise, vibration and artificial lighting impacts mainly during construction for the project. As the potential impacts would be similar for all species, further discussion is provided in the assessment of impacts to the koala in section 6.4.4.1.

6.4.4.9.4 Significant residual impacts and offsets

The EIS did not consider that the removal and/or disturbance of 94.91 ha of suitable habitat for the project would result in an SRI on the ornamental snake.

Until pre-clearance surveys are completed and the extent of 'important habitat' impacted (e.g. avoidance of areas with gilgais) is known, this report considers the removal of 69.815 ha of potential ‘important habitat’ for the ornamental snake for all project activities (excluding conductor zone clearing) may result in an SRI requiring an offset under the EPBC Act. Clearing within the conductor clearance zone will allow for all vegetation below 3.5 m to be retained.

Post detailed design, updated impact figures and offset calculations to determine the offset obligation would need to be updated to reflect what habitat will be impacted.

Since acceptance of the final EIS, the proponent has provided updated draft BOMS that reflects the SRI area totals for this species as identified in Table 6.12. These SRI area totals are considered by this report to be the maximum acceptable for this project. Updated SRI areas for each stage of construction would be confirmed through pre-clearance surveys and during detailed design, prior to commencement of clearing for the relevant stage. The actual SRI would then be confirmed by a post-construction audit.

Table 6.12 Significant residual impact totals for the ornamental snake

Habitat type	Temporary project activity – construction (ha)	Permanent project activity – operation (ha)	Total
Suitable (all)	52.905	16.91	**69.815**

The updated draft BOMS identified where suitable offsets for this species may be provided, subject to confirmation of actual SRI impact areas. Reporting on actual SRI areas must include quality scoring for the impacted areas, to determine ultimate offset obligation in line with the EPBC Act assessment guide and calculator. Potential offset properties have been identified in the updated draft BOMS that would provide for offset of SRIs along the whole project.

This report includes recommended conditions for the Commonwealth Minister for the Environment (Appendix 3):

- defining the maximum ornamental habitat disturbance limits and requirements for the proponent to provide offsets for the SRI for the ornamental snake
- requiring that a SMP be prepared for the ornamental snake. The plan must align with the EPBC Act requirements, recovery plan, conservation advice and any relevant TAP
- requiring that all rehabilitation areas be reinstated to the pre-disturbed state and monitored for an appropriate period of time to ensure establishment and long-term sustainability.

6.4.4.9.5 Coordinator-General's conclusion: ornamental snake

The EIS has satisfactorily considered the potential impacts that the project could have on the ornamental snake. However, I am not satisfied that the project has provided enough information on how much 'important habitat' would be removed by the project.

The project is expected to result in an SRI to the ornamental snake. I have recommended conditions to the Commonwealth Minister for the Environment (Appendix 3) requiring a SMP be developed and implemented for the ornamental snake, and that an appropriate biodiversity offset is delivered for impacts to ornamental snake.

In consideration of the proposed mitigation and management measures, proponent commitments, the draft BOMS and conditions recommended in this report, it is concluded that the approved conservation advice for this species has been considered; the proposed management actions are not inconsistent with the conservation advice; and the impacts on the ornamental snake are not unacceptable.

6.4.4.10 Plains death adder

6.4.4.10.1 Background

The plains death adder is listed as 'vulnerable' under the EPBC Act. The exact distribution of the species is unclear though fragmented populations are known to occur in the flat, treeless, cracking-soil riverine floodplains of the Mitchell Grass Downs bioregion of western Queensland. The species distribution is known to overlap with the Community of native species dependent on natural discharge of groundwater from the GAB TEC (considered in section 6.4.2).

The species was not observed during surveys; however, suitable habitat was intermittently mapped within the Mount Isa Augmentation, Southern Connection and Woodya sections of the project corridor.

6.4.4.10.2 Recovery plans, conservation advice and threat abatement

There is no recovery plan or TAP relevant for the species. The species has an approved conservation advice: *Approved Conservation Advice for Acanthophis hawkei (plains death adder)*.[89]

Key threats to the species listed in the conservation advice relevant to the project include:

- poisoning through cane toad ingestion
- habitat modification through overgrazing by stock, especially cattle, and inappropriate fire regimes.

Relevant priority recovery and threat abatement actions listed in the conservation advice and draft referral guidelines include:

- controlling and managing key threats (i.e. cane toad and fire) at known sites and implement pest management plans and suitable fire management strategies
- implementing monitoring plans specific to the species to identify any other known, potential, or emerging threats and to monitor the progress of recovery, including the effectiveness of management actions
- controlling and managing access on private land and other land tenure.

[89] Commonwealth of Australia, Approved Conservation Advice for *Acanthophis hawkei* (plains death adder), Department of the Sustainability, Environment, Water, Population and Communities, Canberra, 2012. Viewed May 2022, https://www.environment.gov.au/biodiversity/threatened/species/pubs/83821-conservation-advice.pdf.

6.4.4.10.3 Impacts and mitigation

Direct impacts – clearance of habitat

The EIS identified that the habitat within the project corridor is not critical habitat to the survival of the species, and that the habitat utilised by the species are locally abundant within the local landscape.

The EIS estimates that the construction and operation of the project would result in a total clearance and/or disturbance of approximately 609.84 ha (437.78 ha for construction and 172.06 ha for operation) of potential habitat for the plains death adder.

As the species is an ambush predator which conceals itself amongst substrate (i.e. leaf litter) for long periods of time, the plains death adder is specifically susceptible to mortality or injury during construction works because of clearing activities, including an increase in traffic movements and entrapment in excavations. The proponent proposes to flush areas of potential habitat immediately prior to clearing (i.e. spotter-catcher to walk in front of clearing machinery) to allow dispersion from construction sites ahead of machinery or relocation to a safe area.

A reduction in availability of the species food source, such as frogs and lizards, may also occur within construction sites where ground cover is disturbed. The EIS identifies that a loss to the abundance of prey within impact areas may lead to a disruption to the breeding cycle at a localised level; however, it is unlikely the breeding cycle of an important population at the broader landscape scale would be disrupted.

The EIS concludes the impacts predicted to this species are temporary only and the plains death adder would continue to utilise all project impact areas once natural revegetation of ground cover has occurred. This report agrees with this conclusion; however, considers the operational access track, substation and CEV hut impact areas would permanently remove suitable habitat for the species as continuing use of these areas during operation would prevent natural revegetation.

The distribution of the plains death adder within the project corridor is non-uniform and can occur anywhere throughout its suitable habitat. As a nomadic species, the EIS also concluded that the local population of the species would already transition to sites outside of the project corridor and therefore the project is unlikely to fragment an existing population into 2 or more populations.

The proponent has committed to the preparation and implementation of a flora and vegetation management plan, traffic management plan, fauna management plan and a SMP as part of the CEMP, as detailed for the koala, and would include measures that address the project ’s impacts on the plains death adder.

Increased occurrence of weeds and pests

Cane toads, which pose a threat through toxic ingestion and mortality, were also identified throughout the project corridor and are predicted to already occupy suitable habitat for the species. The EIS indicates the cane toad is attributed as the cause of the decline of the plains death adder by 89% and is predicted to occupy the entirety of the species habitat by 2030.

As the potential pest and weed impacts would be similar for the squatter pigeon, further discussion is provided in the assessment of impacts to the squatter pigeon in section 6.4.4.2. The EIS concludes the implementation of pest mitigation and management measures would ensure the spread of the cane toad throughout the species suitable habitat would not be exacerbated by the project.

6.4.4.10.4 Significant residual impacts and offsets

This report agrees with the position in the EIS that the project is unlikely to have an SRI on the plains death adder where permanent and temporary project activity areas will continue to provide habitat for the

species. However, where fencing or compaction of soils (i.e. ongoing use for vehicle movements) prevents groundcover to be naturally re-established, the project would result in an SRI.

Based on the information provided in the EIS, this report considers the removal of 121.78 ha of potential suitable habitat for the plains death adder would result in an SRI to the species requiring an offset under the EPBC Act.

Table 6.13 Significant residual impact totals for the plains death adder

Habitat type	Temporary project activity – construction (ha)	Permanent project activity – operation (ha)	Total
Suitable (all)	-	121.78	**121.78**

This report includes recommended conditions to the Commonwealth Minister for the Environment (Appendix 3):

- defining the maximum plains death adder habitat disturbance limits and requirements for the proponent to provide offsets for the SRI for the plains death adder
- requiring that a SMP be prepared for the plains death adder. The plan must align with the EPBC Act requirements, recovery plan, conservation advice and any relevant TAP
- requiring that all rehabilitation areas be reinstated to the pre-disturbed state and monitored for an appropriate period of time to ensure establishment and long-term sustainability.

6.4.4.10.5 Coordinator-General's conclusion: plains death adder

The EIS has satisfactorily considered the potential impacts that the construction and operation of the project could have on the plains death adder.

The project is expected to result in an SRI to the plains death adder. Conditions to the Commonwealth Minister for the Environment are recommended in this report (Appendix 3) requiring a SMP be developed and implemented for the plains death adder, and that an appropriate biodiversity offset is delivered for impacts to the plains death adder.

In consideration of the proposed mitigation and management measures, proponent commitments, the draft BOMS and conditions recommended in this report, it is concluded that the approved conservation advice for this species has been considered; the proposed management actions are not inconsistent with the relevant conservation advice; and the impacts on the plains death adder are not unacceptable.

6.5 Listed migratory species

In deciding whether or not to approve the proposal for the purposes of a subsection of section 20 or section 20A of the EPBC Act, and what conditions (if any) to attach to such an approval, the Commonwealth Minister for the Environment must not act inconsistently with Australia's obligations under the:

- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)
- Japan-Australia Migratory Bird Agreement (JAMBA)
- China-Australia Migratory Bird Agreement (CAMBA)
- Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).

In accordance with the *Matters of National Environmental Significance: Significant impact guidelines*, an action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:

- substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species
- result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or
- seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

6.5.1 Background

A search of the PMST database and Wildlife Online databases identified 38 listed migratory species as potentially occurring within the study area. Of these, the EIS identified 9 of those with suitable habitat present or previously recorded within the project corridor or observed species presence onsite during surveys:

- Glossy ibis (*Plegadis falcinellus*)
- Caspian tern (*Hydroprogne caspia*)
- Fork-tailed swift (*Apus pacificus*)
- Oriental pratincole (*Glareola maldivarum*)
- Marsh sandpiper (*Calidris ferruginea*)
- Latham's snipe (*Gallinago hardwickii*)
- Gull-billed tern (*Gelochelidon nilotica*)
- Wood sandpiper (*Tringa glareola*)
- White-throated needletail (*Hirundapus caudacutus*).

6.5.2 Impacts and mitigation

6.5.2.1 Direct loss of habitat

Of the migratory species identified above, only the glossy ibis, marsh sandpiper, gull-billed tern and oriental pratincole were recorded within the study area during field surveys undertaken for the EIS assessment. The wood sandpiper and Caspian tern were both recorded 4 km north of the study area at the Chinaman Creek Dam and have been historically confirmed present within the study area based on previous records. Despite the fork-tailed swift, Latham's snipe and white-throated needletail not being recorded during the EIS survey effort, the EIS noted these species are known to utilise habitat within the study area.

The EIS identified non-breeding habitat likely to be impacted consists mostly of ephemeral waterbodies and watercourses which provide for sub-optimal habitat; as such the EIS determined that the habitat in the project corridor does not constitute 'important habitat'. The EIS also indicated no breeding habitat, or any single, large waterbody associated with a communal source of habitat is contained within or likely to be impacted by the project corridor.

This report considers that, although suitable non-breeding habitat may be present onsite and would be impacted by the project (352.27 ha in total) for some of the migratory species identified, there are a lack

of records to indicate that the project corridor contains an ecologically significant proportion of any of the migratory species.

Based on the information provided in the EIS, for the above listed migratory species the project would not:

- adversely impact important populations
- adversely impact habitat critical to their survival
- modify, destroy, remove or decrease the availability or quality of habitat to the extent that any of the species is likely to decline.

This report acknowledges that the concept design has been selected to largely avoid wetland areas which provide habitat for migratory species and areas of known occurrences. The proponent has committed to undertake pre-clearance surveys during the detailed design to determine opportunities to further avoid or minimise impacts to migratory species through infrastructure placement, tower heights (up to 75 m) and/or altered span distances (between 500 m to 600 m) between transmission tower locations.

The proponent has committed to the preparation and implementation of a flora and vegetation management plan, fauna management plan and a SMP as part of the CEMP, as detailed for the koala in section 6.4.4.1 and would include measures that address the project 's impacts on the migratory species.

The CEMP, which will be prepared and implemented during construction, would include measures that would address impacts on migratory species, such as weed hygiene, erosion and sediment control, hazardous materials and altered fire regimes.

6.5.2.2 Introduction of pest and weed species

As the potential weed impacts would be similar for the squatter pigeon, further discussion is provided in the assessment of impacts to the squatter pigeon in section 6.4.4.2.

6.5.2.3 Disturbances – noise, vibration and light pollution

The EIS indicates that construction activities are likely to increase noise and vibration in areas within or adjacent to migratory bird habitat. Additionally, lighting used during construction also has the potential to disturb migratory birds foraging. As the potential impacts would be similar for all species, further discussion is provided in the assessment of impacts to the koala in section 6.4.4.1.

6.5.3 Significant residual impacts and offsets

From the identification of the habitat onsite and in consideration of the number of species identified onsite during surveys, the habitat is not considered likely to be of critical importance, is not at the limit of the species range or in an area where the species is declining. Given the nature of the species as defined in SPRAT (large home ranges, foraging requirements etc.) this report is satisfied with the conclusion in the EIS that the project would not result in an SRI to the threatened migratory species listed above.

6.5.4 Coordinator-General's conclusion: listed migratory species

This report concludes that the project is unlikely to be inconsistent with any international conventions relevant to migratory species (Bonn Convention, JAMBA, CAMBA and ROKAMBA).

This report considers that the wetland habitat proposed to be removed for the project represents only a small portion of the wetland habitat available for use by migratory species at the local, regional and across the greater extent of Queensland.

7. Conclusions

In undertaking my evaluation, I have considered the EIS (comprising draft EIS and revised draft EIS), submissions on the EIS and agency advice.

I am satisfied that the requirements of the SDPWO Act have been met and that sufficient information has been provided to enable the evaluation of potential impacts, and the development of mitigation strategies and conditions.

I consider that the mitigation measures, all conditions imposed, recommendations and commitments, in this report would result in acceptable overall outcomes.

Accordingly, I recommend the CopperString Project proceed, subject to the conditions in Appendix 1, the recommendations in Appendix 2 and Appendix 3, and the proponent commitments in Appendix 4. In addition, it is expected that the proponent's commitments will be fully implemented as presented in Appendix 4 of this report.

To proceed further, the proponent will be required to obtain the following key approvals prior to project commencement:

- obtain EPBC Act approval
- obtain relevant development approvals under the Planning Act.

Chapter 6 of this report describes the extent to which the material supplied by the proponent addresses the actual or likely impacts on MNES of the controlled action for the project.

The report includes recommended conditions for proposed subsequent MIDs for the consideration of the Queensland Planning Minister under the Planning Act. The MID recommendations in this report support the mitigation measures and commitments described by the proponent in the EIS for the project.

Copies of this report will be issued to:

- the Commonwealth Minister for the Environment
- the Deputy Premier, Minister for State Development, Infrastructure, Local Government and Planning.

A copy of this report will also be available on the Department of State Development, Infrastructure, Local Government and Planning's website at **www.statedevelopment.qld.gov.au/coordinator-general/copperstring-project**.

This report will lapse 3 years following publication date of this report, unless the Coordinator-General sets another date at a future time that extends the report.

Appendix 1. Imposed conditions

This appendix includes conditions imposed by the Coordinator-General under section 54B of the *State Development and Public Works Organisation Act 1971* (SDPWO Act). In accordance with section 54D of the SDPWO Act, these conditions apply to anyone who undertakes the construction and operational aspects of the project, such as the proponent, an assignee, agent, contractor, subcontractor or licensee of the proponent.

All the conditions imposed in this appendix take effect from the date of this Coordinator-General's evaluation report. These conditions do not relieve the obligation for approvals and licences from relevant authorities required under any other Acts to be obtained for the project.

Part A. Social conditions

Condition 1. General

(a) The proponent must advise the Coordinator-General in writing of the commencement of project construction within twenty (20) business days of the date of commencement.

Condition 2. Social impact management plan

(a) The proponent must submit to the Coordinator-General for approval a finalised social impact management plan (SIMP) at least three months prior to commencement of project construction.

(b) The SIMP must outline the proposed management measures for key impacts identified in the identified in the project EIS social impact assessment.

(c) The SIMP must include a communications and stakeholder engagement plan in accordance with Condition 3.

(d) The SIMP must include a monitoring and evaluation framework that includes performance indicators and desired management outcomes for the identified key impact areas.

(e) The proponent must publish the SIMP on their website within one month of the Coordinator-General's approval of the plan.

Condition 3. Communications and stakeholder engagement plan

(a) The proponent must prepare a communications and stakeholder engagement plan (CSEP) that is to be submitted as part of the SIMP to the Coordinator-General for approval, in accordance with Condition 2 of this part.

(b) The CSEP must include the following:

(i) objectives and key performance indicators

(ii) a summary profile of the local community, focusing on potentially affected stakeholder groups

(iii) an analysis of key stakeholders and stakeholder issues

(iv) communication activities and tools

(v) roles and responsibilities for engagement

(vi) engagement schedules and/or action plan

(vii) monitoring and reporting requirements

(viii) an appropriately-scaled complaints management process

(ix) processes for incorporating stakeholder feedback into further development of project-specific impact mitigation strategies

(x) processes for providing timely notification to local job seekers and industry service providers (including Aboriginal and Torres Strait Islander businesses) regarding potential employment and procurement opportunities

(xi) reporting on land access management plans developed for each landholder to document agreed access, rehabilitation, communication and compensation arrangements

(xii) processes for providing advanced notice to the stakeholders of construction activities, including: any works which may occur outside of standard working hours; interruptions to utility services; transmission line stringing by helicopter; changed traffic or property access conditions; or periods of predicted high noise, vibration or traffic activities.

(c) The CSEP is to be reviewed and, if necessary, amended during the construction stages in response to changed circumstances or increased knowledge of impacts.

Condition 4. Reporting on the implementation of social impact management plan

(a) The proponent must report on the implementation and effectiveness of measures to manage the project's social impacts during the construction stages.

(b) The proponent is to provide an annual social impact management report (SIMR) to the Coordinator-General for each year of construction, from the commencement date of project construction.

(c) The SIMR must:

(i) describe the social impact management actions undertaken with respect to each of the key impacts identified in the project EIS social impact assessment and the effectiveness of these actions in achieving the management objectives and performance indicators established for each impact area in the SIMP.

(ii) where relevant, identify any new impacts (negative and positive) on project-affected communities from the project during the relevant construction stages and the management actions undertaken to address them.

(iii) report key themes received from consultation on the project in line with the CSEP and via complaint mechanisms, including how key complaints were resolved.

(d) Each SIMR must describe the construction workforce management and mitigation strategies that have been implemented. This must include a description of:

(i) actions undertaken to support development of the skills base and future local workforce of the regional area

(ii) the number of workers who identify as having a disability, identify as an Aboriginal or Torres Strait Islander or are female.

(e) Each SIMR is to be made publicly available on the proponent's website within one (1) month of review completion by the Coordinator-General.

Appendix 2. Recommendations

Part A. Recommended information requirements for any Ministerial Infrastructure Designation request(s)

This part identifies information requirements for any request(s) for a Ministerial Infrastructure Designation (MID) for the project. These information requirements should be satisfied when any MID request(s) are lodged for consideration by the Department of State Development, Infrastructure, Local Government and Planning.

The following recommendations for information, made under section 43 of the *State Development and Public Works Organisation Act 1971*, are provided to guide consideration of any MID request(s) made under chapter 2, part 5 of the *Planning Act 2016* for this project. These recommendations do not limit a decision maker's ability to seek additional information nor power to impose conditions on any MID.

Number/ identifier	Recommendation
1.	The location and design of the project alignment and supporting infrastructure components including in a MID request(s) should generally reflect the alignment and components of the project assessed in the EIS and evaluated in the Coordinator-General's evaluation report for the project. MID request(s) may be made for delivery the project as described in the EIS in stages.
2.	Any MID request(s) must include reference to the project EIS and the Coordinator-General's evaluation report for the project including conditions, recommendations and proponent commitments.
3.	Any MID request(s) must ensure that the current versions of State Development Assessment Provisions (SDAP), State Planning Policy (SPP) mapping and/or vegetation mapping are used and referred to in any MID request(s).
4.	Any MID requests(s) must include a report on outcomes of consultation with relevant local government councils. This report should detail: • preferred worker accommodation arrangements with each council, including: – location of accommodation, and whether this requires construction of a new facility or upgrade/use existing facility. – appropriate servicing arrangements for the facility/facilities – detail induction arrangements for each location to address potential impacts on local communities • waste disposal arrangements where use of council waste facilities has been agreed.
5.	Any MID request(s) must include a report on consultation with owners/operators of existing infrastructure (rail, road, electricity, gas) detailing agreements on crossing separations and any planned outages to operation of existing infrastructure due to commencement of the action.
6.	Any MID request(s) is to include a report on consultation with directly impacted landholders detailing: • potential locations of project infrastructure, components and activities for each property • how potential land use conflicts and amenity considerations are to be managed for each property • access and options agreements reached with landholders, and ongoing engagement or negotiations.
7.	Any MID request(s) is to include a report on consultation with the Department of Regional Development, Manufacturing and Water (DRDMW) and relevant local government councils regarding the use of existing licensed and authorised water sources during construction. This report should detail outcomes of this consultation and detailed agreed water supply solutions for construction of the project.

Number/ identifier	Recommendation
8.	Any MID request(s) must report outcomes of consultation with relevant local government councils, the Department of Agriculture and Fisheries (DAF) and other relevant government agencies regarding waterway crossings for project access tracks. This should include any requirements for waterway barrier works approvals associated with access tracks for the project identified through this consultation.
9.	Any MID request(s) is to include updated information on progression of desktop flood risk studies, including detailed hydraulic modelling, to confirm predicted project impacts to existing flood regimes. Modelling outcomes are to confirm that that project activities would not adversely impact on the safety and efficiency of local or State controlled roads and railways, and would not adversely impact on adjoining properties (including buildings and infrastructure).
10.	Any MID request(s) for the project which intersects the Ballara Nature Refuge is to specifically report on consultation progress with the Ballara Nature Refuge landholder, and on progress made by that landholder in engagement with DES regarding revocation of part of the Nature Refuge and development of an updated conservation agreement.
Transport	
11.	A traffic impact assessment (TIA) which complies with the Department of Transport and Main Roads' (DTMR) Guide to Traffic Impact Assessment 2017 is to be provided within a MID request. The TIA will include a detailed rail impact assessment, supplied to Queensland Rail and DTMR detailing the traffic volumes expected to traverse level rail crossings, the frequency and period of operation. This will include peak traffic volumes, such as daily workforce movements in addition to heavy, over dimensional vehicles that will cross rail structures including level crossings.
12.	The proponent is required to consult the Port of Townsville regarding berth availability and height restrictions for transport of project components and material and report on this consultation and outcomes in information provided to support the MID request(s).

Part B. Recommended conditions for Ministerial Infrastructure Designation

This part provides recommended conditions for determination of any future Ministerial Infrastructure Designation (MID) request(s) for the project. These recommendations are for consideration by the Department of State Development, Infrastructure, Local Government and Planning in making recommendations to the Minister responsible for administering the *Planning Act 2016*.

The following recommendations, made under section 43 of the *State Development and Public Works Organisation Act 1971*, are provided to guide consideration of any MID request(s) made under chapter 2, part 5 of the *Planning Act 2016* for this project. These recommendations do not limit a decision maker's ability to seek additional information nor power to include requirements on any MID.

Where requests for MID(s) are not lodged for this project, this section is to be considered as providing recommendations for consideration of development approvals for the project under the *Planning Act 2016*. These recommendations do not limit an assessment manager's ability to seek additional information nor power to impose conditions on any development approval required for the project.

Number	Recommended requirement
General	
1.	(a) In undertaking the action, the commitments, mitigation and management measures considered in the Coordinator-General's evaluation report for the project's environmental impact statement (EIS) are to be implemented, including: (i) proponent commitments (ii) management and mitigation measures for inclusion in a Construction Environmental Management Plan (CEMP) (iii) management and mitigation measures for inclusion an Operational Environmental Management Plan (OEMP)
2.	(a) Prior to commencement of the action, provide a report on consultation with owners/operators of existing infrastructure (rail, road, electricity, gas) detailing agreements on crossing separations and any planed outages to operation of existing infrastructure due to commencement of the action.
3.	(a) Prior to commencement of the action, the proponent must obtain in-principle support from the Department of Resources for the construction of the project as assessed in the EIS prior to registration of easements on State leasehold land.
4.	(a) Prior to the commencement of the action: (i) consult with impacted landholders regarding the final locations of project infrastructure/components as confirmed during detailed design (ii) provide information on project design and construction methods to investigate how land use conflicts and amenity considerations are to be managed for each property (iii) report on landholder consultation including confirmation of access and options agreements reached. (b) All landholder engagement associated with land access negotiations is to be conducted in accordance with the Land Access Strategy provided in the project EIS.

Number	Recommended requirement
5.	(a) Following completion of construction works for the project, submit a shape file of the final location of the transmission line towers, substations, maintenance access tracks and any other permanent infrastructure to the Department of State Development, Infrastructure, Local Government and Planning (DSDILGP) (infrastructuredesignation@dsdilgp.qld.gov.au).
Traffic impact assessment	
6.	(a) Prior to commencement of works, finalise a Traffic Impact Assessment (TIA) (State Roads) certified by a Registered Professional Engineer of Queensland (RPEQ). (b) The TIA (State Roads) must be prepared in accordance with the Department of Transport and Main Roads' (DTMR) Guide to Traffic Impact Assessment 2017 and include/address: (i) the expected traffic distribution for both light and heavy vehicles on the state-controlled road network as a result of the proposed development, identifying all traffic (haul routes) construction, access locations and intersections (ii) a breakdown of the type and number of all heavy vehicle movements (including any over mass / over dimensional vehicles) detailing: ▪ the quantities, dimensions and origin of all material to be transported ▪ whether the movements are one or two way ▪ impacts from the transportation schedule for material arriving through a port (Townsville / Brisbane). (iii) an assessment of all access locations to the state-controlled road network including access tracks / laydown areas (iv) a breakdown of all trips associated with the proposed workforce during the construction phase (v) detailed information on staging and timing of construction activities (vi) a pavement impact assessment, identifying any sections of the state-controlled road network which the project will result in Standard Axle Repetitions (SAR) exceeding 5% of the base case SARs in either direction on the road link (vii) where assessment identifies mitigation is required, recommend measures to mitigate the impacts of the project on the safety, efficiency and condition of the state-controlled road networks. (c) The TIA is to be finalised in consultation with the relevant transport authorities, such as DTMR, Queensland Rail, Department of Education, and local government councils. (d) Submit a copy of the TIA (State Roads) to DSDILGP (infrastructuredesignation@dsdilgp.qld.gov.au) and DTMR (ministerialdesignations@tmr.qld.gov.au). (e) Liaise with DTMR to obtain the necessary approvals to undertake works for any necessary intersection/accesses upgrades, other required works and impact mitigation strategies as detailed in the TIA (State Roads).

Road use management plan and traffic management plan		
7.	(a)	Prior to the commencement of works prepare a road use management plan (RUMP) and construction traffic management plan (CTMP).
	(b)	RUMP/s and CTMP/s are to be prepared in consultation with the relevant transport authorities, (DTMR, Queensland Rail, Department of Education, and local government councils). Other agencies including the Queensland Police Service (QPS), the Queensland Ambulance Service (QAS) and the Queensland Fire and Emergency Services (QFES) are to also be consultted as necessary in preparation of the RUMP/s and TMP/s.
	(c)	The CTMP must be RPEQ certified and include/address: (i) be informed by the TIA (State Roads) and TIA (Local Roads) (ii) proposed construction traffic volumes (iii) temporary road closures including emergency service access (iv) impacts on local school bus routes (v) over dimensional road loads crossing rail infrastructure (e.g. rail level crossings and rail bridges) including measures maintaining the safety and operational integrity of railway level crossings (vi) hazardous/dangerous goods transportation (vii) maintenance and remediation works in the event of road damage caused by project traffic (viii) management and maintenance of property and access tracks (ix) a communication strategy.
	(d)	Identify the necessary legislative requirements for installation of project components on DTMR land (e.g. state-controlled roads and railways), justify locating such assets on public land, and provide RPEQ certified plans and work methodology compliant with relevant legislation.
	(e)	Submit a copy of the RUMP/s and TMP/s to DTMR (ministerialdesignations@tmr.qld.gov.au), DSDILGP (infrastructuredesignation@dsdilgp.qld.gov.au) and all local government councils traversed by the project.
	(f)	The construction of the development must be undertaken in accordance with the CTMP.
8.	(a)	Provide details of construction routes, traffic volumes and vehicle details for the action to inform Australian Level Crossing Assessment Model (ALCAM) assessments, in accordance with Queensland Rail's Guide to Development in a Transport Environment.
9.	(a)	Relevant stakeholders must be engaged prior to any maintenance, upgrades or refurbishment work that may impact on the road network being undertaken during operation of the project.

Works adjacent to a railway corridor and railway crossings	
10.	**Earthworks adjacent to railway corridor** (a) Any excavation, filling/backfilling/compaction, batters, retaining structures, stormwater management measures and other works involving ground disturbance must not encroach upon or de-stabilise the existing railway corridor, including all transport infrastructure or the land supporting this infrastructure, or cause similar adverse impacts. (b) RPEQ certification with supporting documentation must be provided, prior to commencement of construction and prior to commencement of operation, to the Program Delivery and Operations Unit, North Queensland Region (North.Queensland.IDAS@tmr.qld.gov.au) within DTMR. This is to confirm that the development has been designed and constructed in accordance with part (a) of this condition.
11.	**Fencing** (a) Fencing sufficient to prevent unauthorized access by people and vehicles and must be provided along any construction site boundary with the existing railway corridor prior to and during construction, or maintained at all times where existing rail corridor fencing is in place.
12.	**Dangerous goods** (a) Dangerous goods for use during project construction must not adversely impact on the safety or operational integrity of the railway corridor. (b) At least six months prior to the commencement of use, RPEQ certification must be provided to the Program Delivery and Operations Unit, North Queensland Region within DTMR (North.Queensland.IDAS@tmr.qld.gov.au), confirming that the development has been designed in accordance with part (a) of this condition. In particular, the RPEQ certification must include supporting documentation addressing the following: (i) a risk assessment in accordance with *Risk Assessment Guide of the Guide for Development in a Transport Environment: Rail* (ii) details of the measures that have been incorporated into the design and management of the development to minimise any identified risks, including but not limited to: ▪ minimising or controlling the outbreak of fire ▪ controlling smoke and/or gas release and dispersion ▪ minimising heat build-up in structures ▪ limiting the possibility of structural components being blast damaged ▪ providing stability or contingency measures in the proposed development ▪ providing safe emergency access and egress ▪ ensuring effective containment and clean-up of dangerous goods incidents. (c) The development must provide dangerous goods management measures in accordance with parts (a) and (b) of this condition. This is to occur prior to the commencement of use and to be maintained at all times.
13.	**Railway level crossing safety** (a) The action must ensure that there is no disruption to the safety and operational integrity of railway level crossings at all times. (b) RPEQ certification must be provided, at least six months prior to the commencement of construction and at least six months prior to the commencement of use, to the Program Delivery and Operations Unit, North Queensland Region within DTMR (North.Queensland.IDAS@tmr.qld.gov.au), confirming that the development has been

	designed in accordance with part (a) of this condition. In particular, the RPEQ certification must include supporting documentation addressing the following: (i) a swept path analysis of the maximum design vehicle demonstrating adequate queuing distance between impacted railway level crossing/s and relevant intersections/access points. The minimum clearance must be 5m from the edge running rail (of the closest railway track) as per Section 5.4 – Short Stacking and Figure 3.2 – Yellow Box Marking of AS1742.7:2016 *Manual of Uniform Traffic Control Devices, Part 7: Railway* plus the length of the maximum design vehicle. (ii) written evidence that comparative Australian Level Crossing Assessment Model assessments demonstrate the development will not worsen the safety risk at the impacted railway level crossing/s or detailed design drawings showing mitigation measures in accordance with AS1742.7:2016 *Manual of Uniform Traffic Control Devices, Part 7: Railway* and other relevant standards to mitigate the identified risks. (c) The development must be carried out generally in accordance with parts (a) and (b) of this condition.
14.	**Railway noise (construction camps)** (a) Prior to the commencement of the action and to be maintained at all times, noise attenuation measures to achieve the following railway noise criteria must be provided: (i) for all private and communal open space associated with the workers camps the following external noise criteria must be met: ▪ ≤ 62 dB(A) Leq (24 hour) free field; ▪ ≤ 84 dB(A) single event maximum sound pressure level) free field; ▪ ≤ 65 dB(A) Leq (24 hour) façade corrected; and ▪ ≤ 84 dB(A) single event maximum sound pressure level) façade corrected. (ii) For all residential workforce accommodation not covered by Mandatory Part 4.4 of the Queensland Development Code, the following internal noise criteria must be met: ▪ ≤ 45 dB(A) single event maximum sound pressure level) for all habitable rooms. (b) RPEQ certification with supporting documentation must be provided, prior to the commencement of construction and prior to the commencement of use, to the Program Delivery and Operations Unit, North Queensland Region (North.Queensland.IDAS@tmr.qld.gov.au) within DTMR, confirming that the development has been designed and constructed in accordance with part (a) of this condition.
15.	**Design and construction in proximity to railway (collision protection)** (a) For any works within a railway, prior to the commencement of the action and to be maintained at all times, the development must be designed and constructed in accordance with Queensland Rail Civil Engineering Technical Requirement CIVIL-SR-012 - *Collision Protection of Supporting Elements adjacent to Railways*. (b) RPEQ certification with supporting documentation must be provided prior to the commencement of construction and prior to the commencement of use, to the Program Delivery and Operations Unit, North Queensland Region (North.Queensland.IDAS@tmr.qld.gov.au) within DTMR, confirming that the development has been designed and constructed in accordance with part (a) of this condition.

Vegetation management and matters of state environmental significance	
16.	(a) Retain existing mature vegetation unless required to be removed to facilitate the proposed development or respond to an unacceptable safety risk which is to be confirmed by a suitably qualified person. (b) Prior to the commencement of works, undertake the necessary actions to protect vegetation that is not required to be cleared from construction impacts. (c) Relocate any removed habitat features and resources (e.g. large woody debris, tree hollows, logs, rocks) required to be removed to facilitate the proposed development to adjacent areas. (d) Cleared vegetation must: (i) not be stacked or pushed against mature trees, habitat trees or tall immature trees that is not required to be cleared from construction impacts (ii) not obstruct the flow of drains or watercourses (iii) allow safe passage for stock and vehicles.
17.	(a) Any impacts of the action on matters of state environmental significance (MSES) including threatened species habitat and the Ballara Nature Refuge is to be generally in accordance with the project corridor as assessed in the project EIS and evaluated in the Coordinator-General's evaluation report for the project. (b) Any components of the action requiring revocation of the Ballara Nature Refuge and associated amendment to the conservation agreement are to be generally in accordance with the project as assessed in the project EIS and evaluated in the Coordinator-General's evaluation report for the project. (c) The action as assessed in the EIS and evaluated in the Coordinator-General's evaluation report for the project must not impact on more than the maximum disturbance limit for each MSES identified below[#]: (i) Purple-necked rock wallaby habitat: maximum disturbance limit 90.77ha (ii) Ballara Nature Refuge: maximum disturbance limit 191.52 ha (iii) Koala habitat*: maximum disturbance limit 393.21 ha (iv) Squatter pigeon habitat *: maximum disturbance limit 50.82 ha (v) Black-throated finch habitat *: maximum disturbance limit 705.90 ha (vi) Night parrot habitat *: maximum disturbance limit 308.29 ha (vii) Australian painted-snipe habitat *: maximum disturbance limit 219.14 ha (viii) Painted honeyeater habitat *: maximum disturbance limit 945.57 ha (ix) Julia Creek dunnart habitat *: maximum disturbance limit 243.28 ha (x) Ornamental snake habitat *: maximum disturbance limit 69.82 ha (xi) Plains death adder habitat *: maximum disturbance limit 121.78 ha. <u>Notes:</u> *this MSES is also listed as matters of national environmental significance (MNES) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This MSES, including biodiversity offset obligations for significant residual impacts, are to be addressed by a decision on the project under the EPBC Act.

	#No significant residual impact has been identified in evaluation of the project EIS on MSES not listed in this condition. No significant residual impact is authorised for any MSES other than those listed in this condition. (d) Prior to commencement of the action, pre-clearance surveys are to be undertaken to confirm the extent of impact to the above matters as a result of project activities. Surveys by a suitably qualified wildlife officer or ecologist must including a pre-clearing inspection of trees, wet areas and other suitable vegetation or habitat for listed threatened fauna, hollows, nests and other breeding places. (e) The suitably qualified wildlife officer or ecologist must be present during clearing operations: (i) to advise on the staging and sequencing of clearing (ii) to ensure risk of injury to, or death of fauna is minimised. (f) The results of the pre-clearance surveys must be submitted to DSDILGP (infrastructuredesignation@dsdilgp.qld.gov.au) and are to be reflected in update to the draft Biodiversity Offset Management Strategy (BOMS) considered in Coordinator-General's evaluation report for the project. (g) Biodiversity offsets for significant residual impacts to any MSES are to be delivered as identified in the updated BOMS for the project, including securing offset properties, management measures, (h) Offset obligations for impacts to the Ballara Nature Refuge are in addition to the offsets required for significant residual impacts on MSES located within the refuge as identified in the updated BOMS for the project. (i) Final impacts on each MSES are to be confirmed in a post-construction audit, reported to the Department at the completion of construction of the/each action.
18.	(a) Prior to the commencement of construction, the proponent must determine all species breeding places requiring a species management program (SMP), including the purple-necked rock wallaby. An SMP for each species is to consider results of targeted pre-clearance surveys of potential listed threatened species habitat within the project footprint. (b) Each SMP is to include: (i) detail of targeted pre-clearance surveys of potential habitat undertaken within the clearing footprint and any other species-specific investigations (ii) measures to limit construction activities to avoid breeding seasons of threatened species (iii) where required, measures to relocate individuals identified during pre-clearance surveys by qualified and experienced fauna spotter-catchers, install fauna exclusion fencing and enforce speed limits onsite. (c) SMPs are to be lodged with DES for approval under the NC Act.
19.	(a) Prior to commencement of works, prepare a Rehabilitation Monitoring Plan (RMP) for the assessment and progressive rehabilitation of disturbed areas, prepared by a person suitably qualified in site rehabilitation. (b) The RMP must include/address: (i) all areas of temporary disturbance to be rehabilitated following construction (ii) soil stabilisation, direct seeding, managing natural regeneration and weeds (iii) re-use of hollow-bearing stags, woody debris, logs and rocks (iv) measures to ensure the restoration and reconnection of habitats

		(v) measures to ensure bank stability and water quality as a result of clearing within watercourse or drainage features (vi) monitoring, auditing and reporting objectives undertaken annually for the first 5 years, to monitor native vegetation regeneration progress, presence of weeds or other disturbance. (c) Submit a copy of the RMP to DSDILGP (infrastructuredesignation@dsdilgp.qld.gov.au). (d) Following completion of works, undertake the rehabilitation of the development generally in accordance with the rehabilitation plan.
Biosecurity management		
20.		(a) Prior to commencement of works, prepare a biosecurity management plan (BMP). (b) The BMP must be prepared by a person suitably qualified in biosecurity management and include/address (i) alignment with key national, state and local biosecurity priorities (ii) collaboration with landholders on any existing property specific integrated pest management or biosecurity management plans (iii) known weeds of national significance, restricted, invasive or regionally declared weeds identified in the project corridor (iv) identification of the origin of high-risk construction materials, machinery and equipment (v) clean down protocols and locations (vi) management and treatment methods to control spread of weeds (vii) promotion of awareness of weed management among project workers (viii) routine weed monitoring during construction and operation to identify any new incidence of weeds considering weed flowering, setting seed and dispersal. (c) Submit a copy of the BMP to DSDILGP (infrastructuredesignation@dsdilgp.qld.gov.au) (d) Prior to the commencement of works at each location, implement the mitigation measures and recommendations of the BMP.
21.		(a) Prior to the commencement of works, undertake a site inspection to confirm the presence of any invasive, declared or pest species (flora or fauna). If found, manage these in accordance with the BMP. (b) Following the first wet season after completion of works, undertake a site inspection to confirm the presence of any invasive, declared or pest species (flora or fauna). If found, remove these in accordance with legislative requirements.
Waterway barrier works		
22.		(a) Works must comply with the Department of Agriculture and Fisheries (DAF) *Accepted development requirements for operational work that is constructing or raising waterway barrier works* or the proponent is to liaise with DAF regarding any operational works permit(s) required for the construction or raising of waterway barrier works.

Water supply		
23.	(a)	Prior to commencement of works, the proponent is to develop a Construction Water Plan in consultation with the Department of Regional Development, Manufacturing and Water (DRDMW). The plan is to include: (i) all sources of taking water, identifying locations where water will be acquired from (ii) amount of water to be taken (outlining maximum limits) (iii) locations of potential water interference, and any new or modified works that will capture overland flow and associated approvals (iv) water resource objectives and mitigation controls.
	(b)	During construction of the project, mitigation works and actions are to undertaken as identified in the Construction Water Plan.
Emergency management		
24.	(a)	Prior to commencement of works liaise with Queensland emergency service agencies in developing and implementing the project emergency response procedures.
25.	(a)	Prior to commencement of works, prepare a bushfire management plan (BFMP).
	(b)	The BFMP is to be consistent with measures detailed in the project EIS and any required updates during detailed design, and must be prepared by a person suitably qualified in bushfire management and include/address: (i) AS3959–2009 - Construction of Buildings in Bushfire Prone Areas (ii) procedures for checking fire hazard warnings and response to emergency and fire situations (iii) site set out measures including location of firefighting equipment, designated smoking areas and cigarette bins (iv) AS1940–2004 - The Storage and Handling of Flammable and Combustible Liquids (v) maintenance of firefighting equipment and training of personnel in the use of firefighting equipment (vi) vegetation clearing for fire protection including a maintenance schedule and management of cleared vegetation (vii) potential fire starts from network components.
	(c)	Submit a copy of the BFMP to DSDILGP (infrastructuredesignation@dsdilgp.qld.gov.au).
	(d)	Prior to the commencement of works at each location, implement the mitigation measures and recommendations of the BFMP.

26.	(a) Prior to the commencement of works, the proponent must prepare and implement a flood emergency and evacuation procedure which addresses the following: (i) emergency procedures including mapped evacuation routes and emergency assembly point(s) (ii) details of warning signage to be installed on work sites alerting of any areas subject to flash flooding and for persons to not traverse flood waters (iii) emergency team roles and responsibilities including contact details (iv) location of emergency equipment/gear such as warden's vest and hats (v) evacuation drill schedule. (b) The flood emergency and evacuation procedure must be updated with the ongoing development and delivery of project stages. (c) All employees and contractors are to be trained to ensure awareness of procedures to be followed during potential flood or other emergency events.
Stormwater management, erosion and sediment control	
27.	(a) Prior to commencement of works at each location/for each stage, prepare a Stormwater Drainage Management Plan (SDMP) for the location/stage, certified by a Registered Professional Engineer of Queensland. (b) The SDMP must be consistent with stormwater quality and quantity management measures detailed in the project EIS and any required updates during detailed design, and must demonstrate the following: (i) a stormwater drainage strategy (ii) detail of the stormwater drainage system including any proposed pre-treatment measures prior to discharge of surface water runoff (iii) no actionable nuisance to adjoining and downstream properties (iv) compliance with the State Planning Policy (SPP) water quality benchmarks. (c) Submit a copy of the SDMP to DSDILGP (infrastructuredesignation@dsdilgp.qld.gov.au). (d) Implement best practice stormwater quantity and quality measures in accordance with the SDMP.
28.	(a) Prior to commencement of works, an Erosion and Sediment Control Plan (ESCP) is to be developed and implemented as part of the CEMP as identified in requirement/condition 33 (below). (b) Following completion of construction works, the proponent is to develop and implement an OEMP for mitigation of potential water quality impacts during operation of the project. The OEMP is to include actions to mitigate impacts from stormwater, flooding and impacts to water quality and surface or groundwater water users.
29.	(a) Stormwater and flooding management of the development must ensure no worsening or actionable nuisance to the existing railway corridor. (b) Any works on the land must not: (i) create any new discharge points for stormwater runoff onto the railway corridor (ii) interfere with and/or cause damage to the existing stormwater drainage on the railway corridor

	(iii)	surcharge any existing culvert or drain on the railway corridor
	(iv)	reduce the quality of stormwater discharge onto the railway corridor
	(v)	reduce the flood storage capacity of the site
	(vi)	impede or interfere with overland flows paths and/or hydraulic conveyance on the site.
	(c)	RPEQ certification with supporting documentation must be provided, prior to commencement of construction and prior to commencement of operation, to the Program Delivery and Operations Unit, North Queensland Region (North.Queensland.IDAS@tmr.qld.gov.au) within DTMR, confirming that the development has been designed and constructed in accordance with parts (a) and (b) of this condition.
Stock route network		
30.	(a)	Any transmission towers within a stock route must be positioned to minimise any impacts on the functionality of the stock route network.
	(b)	The proponent must document and implement management measures for gazetted stock routes impacted by the project that:
	(i)	provide safe passage across the easement for stock, personnel and the general public.
	(ii)	maintain stock routes in accordance with any arrangement reached with landholders, the relevant LGA or the administering authority including any re-aligned stock routes.
Contaminated land		
31.	(a)	Project components and activities are to be located away from potentially contaminated land.
	(b)	The Australian Government Department of Defence must be consulted prior to the commencement of the action to ensure avoidance of any unexploded ordnance.
Lighting		
32.	(a)	All external lighting is installed and maintained to accord with Australian standards and shielded to minimise light spill to the surrounding environment.
Construction management		
33.	(a)	Prior to the commencement of works, prepare and submit a Construction Environmental Management Plan (CEMP) to DSDILGP (infrastructuredesignation@dsdlgip.qld.gov.au). The CEMP must be consistent with management measures detailed in the project EIS and, and must include/address the following:
	(i)	an Erosion and Sediment Control Plan (ESCP) developed in accordance with the Best Practice Erosion and Sediment Control Document, prepared by the International Erosion Control Association and dated November 2008, and Queensland's Construction Phase - Stormwater Management Design Objectives, prepared by the then Department of Infrastructure, Local Government and Planning and dated July 2017, that addresses/includes: ▪ a suitably detailed description of the existing environment ▪ a suitably detailed description of proposed clearing and the post-clearing land use ▪ an erosion hazard and risk assessment associated with both: ▸ the vegetation clearing operations ▸ the post-clearing activities on the development site

	▪ a detailed description of the proposed erosion and sediment control measures applicable during: ▸ the vegetation clearing operations ▸ the subsequent land use ▪ details of the proposed performance monitoring program and an ESCP review process (ii) a Water Quality Management Plan which is to include mitigation works and actions, including measures identified in the EIS for the project, to address potential impacts of the project on the aquatic environment (iii) Flora and Vegetation and Fauna Management Plans (iv) a Rehabilitation Plan for temporary construction sites and cleared areas that includes: ▪ rehabilitation measures for disturbed areas as soon as practicable to limit exposure to erosive processes ▪ remediation measures for any areas of contaminated land ▪ commitments, mitigation, and management measures consistent with those identified in the project EIS. (v) a dewatering management plan that establishes suitable protocols to treat or remove water from the site, should it be required during construction (vi) dust mitigation methods (such as use of water to supress potential dust) and air quality management measures, within an Air Quality (Dust) Management Plan (vii) hours of construction, vibration, and construction noise (including the default noise standards), in accordance with the Environmental Protection Act 1994 (s440R & 440S) (viii) a waste management plan detailing: ▪ preference of waste management in the following order – avoid or reduce, reuse, recycle, recover, treat and dispose ▪ how each waste stream is to be stored, transported and disposed of ▪ estimated quantities of waste from each waste stream ▪ details of waste transport companies to be utilised and copies of any relevant licenses ▪ reporting on consultation with relevant councils regarding disposal at existing council facilities ▪ details of waste disposal facilities to be utilised and copies of any relevant licenses and waste acceptance criteria (ix) a Biosecurity Management Plan (x) measures to manage any contaminated land (xi) cultural heritage management plans (xii) a Hazard, Health and Safety Management Plan detailing disposal and management of hazardous materials and regulated waste, including removal by a suitably licenced contractor where deemed necessary (xiii) traffic access locations for and management of construction vehicle traffic

	(xiv) maintenance of safe pedestrian and cyclist access/movement around the site (if relevant) (xv) proximity of works to easements and services and any necessary design measures, additional analysis or safe work methods (xvi) other required permits from the council, easement holders or utility providers (xvii) complaint resolution procedures, including who to contact and a record of how complaints have been addressed (xviii) a construction communication plan including: ▪ how neighbouring properties will be advised of construction activities for each stage ▪ how the appropriate extent of neighbouring properties to be notified will be determined ▪ timeframes for notification of construction activities to occur prior to works commencing. (b) Construction of the development is to be undertaken in accordance with the CEMP.
34.	(a) The construction of the project must ensure that there will be no disruption to the safety and operational integrity of the existing railway corridor during the course of construction. (b) For all works within a railway environment, a Construction Management Plan for railway considerations must be prepared by a RPEQ, and provided, at least 3 months prior to the commencement of construction, to the Program Delivery and Operations Unit, North Queensland Region within the DTMR (North.Queensland.IDAS@tmr.qld.gov.au). In particular, the Construction Management Plan for railway considerations must address the following relevant to safety and operational integrity of the existing rail corridor, in addition to other relevant considerations identified above: (i) construction methodology (ii) work method statements for earthworks, service and utility connections and stormwater management measures (iii) storage locations, site accommodation facilities, vehicular loading/unloading zones and vehicular access tracks (iv) railway operational requirements and scheduled railway closures (v) unauthorised access prevention to the railway corridor (vi) fencing – temporary and permanent (vii) railway level crossing safety (viii) over-dimensional road loads (ix) adherence to relevant standards and Queensland Rail Civil Engineering Technical Requirements including: ▪ CIVIL-SR-002 – *Work in or about Queensland Rail Property* ▪ CIVIL-SR-016 – *Services under railway property (non-Queensland Rail services).* (c) The construction of the development must be undertaken in accordance with the Construction Management Plan for railway considerations.

Operation management		
35.	(a)	Prior to the commencement of operation, prepare and submit an OEMP to DSDILGP (infrastructuredesignation@dsdilgp.qld.gov.au). The OEMP must be consistent with management measures detailed in the project EIS and should include, at a minimum, the below sub-plans: (i) Air Quality (Dust) Management Plan (ii) Biosecurity Management Plan (iii) Contaminated Land Management Plan (iv) Erosion and Sediment Control Management Plan (v) Fauna Management Plan (vi) Flora and Vegetation Management Plan (vii) Hazards, Health and Safety Management Plan, including hazardous substance register (viii) Noise and Vibration Management Plan (ix) Waste Management Plan (x) Water Quality Management Plan, including stormwater controls.
	(b)	Operation of the action is to be undertaken in accordance with the OEMP.
Geotechnical conditions		
36.	(a)	Prior to commencement of works, undertake a geotechnical investigation that confirms the ground conditions and informs building requirements and identifies any salinity expression areas.
	(b)	Where salinity expression areas are identified, clearing is to be avoided or minimised.
Acid sulfate soils (ASS)		
37.	(a)	If potential or actual ASS is identified during construction, an ASS investigation is to be carried out in accordance with the *Queensland Acid Sulfate Soil Technical Manual – Soil Management Guideline,* version 4.0.
	(b)	If detected, construction of the development is to be managed in accordance with management of the soils should be in accordance with the *Queensland Acid Sulfate Soil Technical Manual – Soil Management Guideline,* version 4.0.
Greenhouse Gas emissions		
38.	(a)	Prior to commencing the action a greenhouse gas offset plan is to be developed and implemented for construction and operational phases of the project which is to: (i) include energy efficiency initiatives (ii) consider the use of renewable energy sources.

Definitions

Construction means construction activities and/or components as defined in the Project Description section of this evaluation report

Commencement of works/commencement of the action means the first instance of any specified activity associated with the action including clearance of vegetation and construction of any infrastructure. Commencement does not include minor physical disturbance necessary to:

- undertake pre-clearance surveys or monitoring programs
- install signage and/or temporary fencing to prevent unapproved use of the project site
- protect environmental and property assets from fire, weeds and pests, including erection or construction of fencing and signage, and maintenance or use of existing surface access tracks.

Department means the Department of State Development, Infrastructure, Local Government and Planning or its successor or predecessors.

EIS for the project/ project EIS means documents comprising the final environmental impact statement for the project conducted under Part 4 of the *State Development and Public Works Organisation Act 1971* and evaluated in this report.

Environmental impacts means impacts that the **project** may have on:

- the physical and ecological integrity of the **Allocation Area** and surrounds;
- the **environmental values** and water quality objectives for the **waters**; and
- the management of fish habitats, marine parks and protected areas in and adjacent to the **Allocation Area.**

Measures has the broadest interpretation and includes:

- **Procedural measures** such as standard operating procedures for dredging operations, environmental risk assessments, management actions, Departmental directions and relevant guidelines
- **Physical measures** such as plant, equipment, physical objects (such as bunding, containment systems etc.), ecosystem monitoring and bathymetric surveys.

Micro-siting means the determination of final siting and configuration of temporary construction activities and operational infrastructure (i.e. transmission towers) to reduce the development footprint and to further minimise impact on ecological values within the project corridor.

Project means the scope and activities comprising the project assessed in the final environmental impact statement for the project conducted under Part 4 of the *State Development and Public Works Organisation Act 1971* and as evaluated in this evaluation report.

Records include: documentation of **measures**; reporting on **measures;** survey results required under a condition of this notice; daily extraction logs and periodic extraction returns; **royalty** payment **records**; written procedures; **records** of maintenance actions; **records** of disposal arrangements; outcomes of risk assessments; documentation of the **removal** of plant, equipment and **measures** from the **Allocation Area** upon completion of the operation.

Waters means all Queensland waters and includes rivers, streams, lakes, lagoons, ponds, swamps, wetlands, surface waters, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), any groundwater and any part thereof.

Part C. General recommendations

The following recommendations, under section 52 of the *State Development and Public Works Organisation Act 1971*, are provided to guide assessment managers or other decision makers in assessing the applications relevant to the project.

These recommendations do not limit assessment managers' or decision makers' ability to seek additional information nor power to impose further conditions on any development approval or other applications required for the project.

Recommendation 1. Advice relating to recommended conditions for protecting the safety and efficiency of railways

Content of this recommendation is as provided by DTMR.

(a) The *Guide to development in a transport environment: Rail* is available at: http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Guide-to-development-in-a-transport-environment-rail.aspx

(b) Railway level crossing safety: The applicant should consult with DTMR in relation to compliance with the railway level crossing condition. Please contact RAPTTA@tmr.qld.gov.au to gain assistance with any requirements for Australian Level Crossing Assessment Model (ALCAM) assessments. The applicant will be required to prepared RPEQ certified traffic information for these assessments and the ALCAM assessments will be undertaken by the railway manager, if required. In particular, the following should be addressed:

- (i) detail the expected traffic distribution on the road network as a result of the proposed development, including haulage routes during construction and operation.
- (ii) identify all railway level crossing/s likely to be impacted by development generated traffic (including construction and operational traffic and staff movements). This should include level crossings on local and state-controlled roads and any private (occupational) level crossings.
- (iii) for each impacted railway level crossing provide:
  - (A) Australian Level Crossing Assessment Model
    - (1) the expected timeframe for the delivery of the proposed development including the commencement of construction and the completion of the development (including any stages).
    - (2) existing traffic flows (expressed as vehicles per day) over the impacted railway level crossing/s, including daily (peak hour) fluctuations, and number and percentage of heavy vehicles and buses.
    - (3) the expected background traffic growth (expressed as vehicles per day) over the impacted railway level crossing/s, including the number and percentage of heavy vehicles and buses. This should include background traffic growth from the anticipated commencement of construction and each development stage to a ten year horizon.
    - (4) the expected development generated traffic (expressed as vehicles per day), including daily fluctuations (peak hour) and percentage of heavy vehicles and buses, that will pass over the impacted railway level crossing/s from the commencement of construction, and each development stage to a ten year design horizon. It is noted that workers will be transported via bus from workers camps.
    - (5) the maximum size and type of vehicle (including length, width, height and weight) anticipated over the impacted railway level crossing/s as a result of the development during construction and on-going operation (including any stages). This should include any over-mass and over-dimension vehicles used to transport components.
    - (6) the following data table should be populated for each impacted railway level crossing:

AADT over railway level crossing (Prepare table for each impacted railway level crossing)				
Year	Without development (background growth)	With development	No. and dimensions/type of heavy vehicles	No. and dimensions/type of buses
2021 (current scenario)				
Commencement of Construction (prepare for each stage)				
Commencement of the use (prepare for each stage)				
Ten year design horizon				

(B) Short Stacking: Development generated traffic must not worsen vehicular queuing (short stacking) issues over impacted railway level crossing/s. In particular, provide the following for each impacted railway level crossing:

(1) Demonstrate that there is sufficient clearance between each railway level crossing and the relevant intersection/vehicular access location to allow the maximum size of vehicle used in the operation to queue. The minimum clearance should be 5m from the edge running rail (of the closest railway track) as per Section 5.4 – Short Stacking and Figure 3.2 – Yellow Box Marking of AS1742.7:2016 Manual of Uniform Traffic Control Devices, Part 7: Railway plus the length of the maximum design vehicle.

(2) Provide a plan accurately showing the available clearance between the railway level crossing and relevant intersection/access point and demonstrate how the maximum vehicle length can be accommodated with the 5 m setback from the closest track. Additionally, the vehicle must not encroach on any safety controls, such as not limited to pavement marking (for example, box marking), for the railway level crossing or road.

(3) Provide a RPEQ certified swept path analysis based on the maximum design vehicle for turns into and out of the railway level crossing/s.

(c) Works in a railway corridor: Pursuant to section 255 of the *Transport Infrastructure Act 1994*, the railway manager's written approval is required to carry out works in or on a railway corridor or otherwise interfere with the railway or its operations.

This includes any transmission line crossings of the railway corridor, over-dimensional road loads and works in the railway corridor, including temporary clearance structures (or hurdles), communication cables or other conduits.

Relevant approvals for works associated with the development in the railway corridor such as a licence to enter and construct, licence to discharge and/or wayleave agreement, among other relevant approvals/agreements may be required from Queensland Rail.

Please be advised that the evaluation of the EIS does not constitute an approval under section 255 of the *Transport Infrastructure Act 1994* and that such approvals need to be separately obtained from the railway manager.

The applicant should contact the Queensland Rail property team at developmentenquiries@qr.com.au in relation to obtaining the necessary approvals.

(d) Over-dimensional Road Loads (Queensland Rail): Under the *Transport Infrastructure (Rail) Regulation 2006* permission from the Railway Manager (Queensland Rail) is required to take over-dimensional road loads across Queensland Rail infrastructure (e.g. railway level crossings and rail bridges). Further information can be obtained from Queensland Rail's website at: http://www.queenslandrail.com.au/forbusiness/overdimensionalloads

Appendix 3. Recommended conditions for the Commonwealth Minister for the Environment

In accordance with section 87 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), this appendix recommends conditions for consideration by the Commonwealth Minister for the Environment in making an approval decision on the proposed action (2019/8416) under of the EPBC Act.

Condition 1. Maximum disturbance limits

The outcome sought by this condition is to ensure the approval holder does not impact on more than the defined maximum disturbance limits* for habitat for listed threatened species.

(a) The approval holder must not impact more than the maximum disturbance limit of habitat for each listed threatened species specified in Table A1 and Table A2.

(b) Project components for the action resulting in the impacts to listed threatened species identified in Table A1 may be carried out in stages as negotiated with the Department.

Table A1. Maximum disturbance limits to habitat for listed threatened fauna species

Listed threatened fauna species or community	Maximum disturbance limit (ha)*
Koala (*Phascolarctos cinereus*)	393.21
Squatter pigeon (*Geophaps scripta scripta*)	50.82
Black-throated finch (*Poephila cincta cincta*)	705.90
Night parrot (*Pezoporus occidentalis*)	308.29
Australian painted snipe (*Rostratula australis*)	219.14
Painted honeyeater (*Grantiella picta)*	945.57
Julia Creek dunnart (*Sminthopsis douglasi*)	243.28
Red goshawk (*Erythrotriorchis radiatus*)[#]	0
Ornamental snake (*Denisonia maculata*)	69.82
Plains death adder (*Acanthophis hawkei*)	121.78

* Maximum disturbance limits for listed threatened species habitat informed by the significant residual impacts as determined from evaluation of information presented in the Environmental Impact Statement for the action.

[#] While no SRI determined or disturbance limit included for this species, retained for future conditioned requirements including confirmatory pre-clearance surveys and species management actions.

Table A2. Maximum disturbance limits for listed threatened flora species

Listed threatened flora species	Maximum disturbance limit (ha)*
Black ironbox *(Eucalyptus raveretiana)* #	0
Pink gidgee *(Acacia crombiei)* #	0
Waxy cabbage palm *(Livistona lanuginosa)* #	0

* Maximum disturbance limits for listed threatened species habitat informed by the significant residual impacts as determined from evaluation of information presented in the Environmental Impact Statement for the action.

While no SRI determined or disturbance limit included for this species, retained for future conditioned requirements including confirmatory pre-clearance surveys and species management actions.

Condition 2. Pre-clearance surveys to define habitat impact

The outcome sought by this condition is to confirm presence and condition of habitat for listed threatened species based on on-ground pre-clearance surveys.

(a) The proponent must undertake pre-clearance surveys of habitat for listed threatened species at least 6 months prior to the commencement of the action to determine the location, quantity and quality of listed threatened species habitat impacted by that project stage.

(b) Species for which surveys must be undertaken include listed threatened species identified in condition 1.

(c) All pre-clearance surveys required by this condition must:

  (i) be designed and undertaken in accordance with recognised guidelines

  (ii) be undertaken by a suitably qualified person

  (iii) inform any relevant monitoring programs required by this approval

  (iv) be reported on within 10 business days of completion of the survey and the report submitted to the Department within 10 business days of the completion of the final report of the survey.

(d) The proponent must reconcile outcomes of the pre-clearance surveys against the maximum disturbance limits as identified in Table A1 and Table A2 and report any variance to the Department within reporting required by part (c)(iv) of this condition.

(e) Prior to the commencement of each project stage (if staging occurs), the proponent must provide the Department with a report, prepared by an appropriately qualified and experienced person(s), which analyses the following:

  (i) for the forthcoming stage–the estimated impact to habitat for each listed threatened species, informed by outcomes of pre-clearance surveys; and

  (ii) for any previous stage(s), if applicable–the actual impact to habitat for each listed threatened species, to date.

Condition 3. Biodiversity offsets management strategy

The outcome sought by this condition is to update the significant residual impact figures and offset obligations for the listed threatened species identified in condition 1, to authorise the impacts for project.

(a) In consultation with the Department, update the biodiversity offset management strategy (BOMS) from the version provided for the environmental impact statement evaluation to include:

  (i) updated impact figures for listed threatened species in condition 1 for each stage of the project as a result of pre-clearance surveys required by condition 2.

  (ii) information to support the updated impact figures in the BOMS including:

(A) detailed justification for the updated impact figures, information which demonstrates that there is suitable available land in the proposed offset areas to compensate the significant residual impact on the listed threatened species and/or details of additional offset areas (including maps in electronic Geographic Information System format)

(B) updated EPBC Act assessment guide calculations and justifications, informed by the updated impact figures

(C) any other information that the Department requires to accept and approve the BOMS.

(b) The approval holder must submit the updated BOMS for the written approval of the Minister 4 months prior to commencement of the action (or prior to commencing construction of each stage if staging occurs).

Condition 4. Offset area management plan/s

The outcome sought by this condition to compensate for the significant residual impacts of the project on the listed threatened species identified in condition 1.

(a) The approval holder must submit an offset area management plan/s for the written approval of the Minister 2 months prior to commencement of the action (or prior to commencing construction of each stage if staging occurs). The approval holder cannot commence the action until the Minister has approved the Offset Management Plan/s.

(b) Each Offset Management Plan must meet the requirements of the *Environmental Offsets Policy* and the Environmental Management Plan Guidelines to the satisfaction of the Minister.

(c) The offset management plan must include:

(i) details of offsets for significant residual impacts to the listed threatened species identified in condition 1[#].

(ii) details of how the proposed offset/s and Offset Management Plan meet the requirements of the EPBC Act *Environmental Offsets Policy*

(iii) a field validation survey and baseline description of the current condition (prior to any management activities) of the offset areas, including existing vegetation, and habitat for the listed threatened species identified in condition 1.

(iv) a description and map (including shapefiles) to clearly define the location and boundaries of the proposed offset area/s, accompanied by the offset attributes

(v) information about how the proposed offset area/s provide connectivity with other relevant habitats and biodiversity corridors

(vi) a description of the management measures (including timing, frequency and duration) that will be implemented in each offset area/s

(vii) a discussion of how proposed management measures take into account relevant approved conservation advices and are consistent with the measures contained in relevant recovery plans and threat abatement plans

(viii) completion criteria and performance targets for evaluating the effectiveness of Offset Management Plan implementation, and criteria for triggering corrective actions

(ix) a monitoring program, which must include:

(1) gathering evidence that effectively determines progress towards, attainment of and maintenance of the ecological benefits for the protected matters

(2) measurable performance indicators to gauge attainment of the ecological benefits for the protected matters

(3) trigger values for corrective actions, and

(4) the timing and frequency of monitoring to detect trigger values and changes in the performance indicators.

(x) a description of potential risks to the successful implementation of the offset/s, and contingency measures that would be implemented to mitigate against these risks

(xi) details of timing and the mechanism to legally secure the environmental offsets.

(d) The approval holder must legally secure the offsets within 12 months of the commencement of the action (or prior to commencing construction of each stage, if staging occurs).

(e) Upon commencement of the action, the approved offset management plan/s must be implemented for the duration of the approval.

[#]The offset obligation for these species must be informed by the by the updated BOMS required by condition 3.

Condition 5. Species management plan

(a) The approval holder must submit a species management plan (SMP) for the written approval of the Minister 3 months prior to commencing the action.

(b) The approval holder must not impact on habitat for listed threatened species identified in condition 1 until the Minister has approved the SMP.

(c) The SMP must:

(i) be generally in accordance with the flora and fauna management and mitigation measures proposed in the Environmental Impact Statement and incorporated in a flora and vegetation management plan and fauna management plan

(ii) be prepared by a suitably qualified person in accordance with the Department's Environmental Management Plan Guidelines and include:

(A) measures that will be implemented to avoid, mitigate and manage impacts to EPBC Act listed threatened species and communities and their habitat during vegetation clearance, construction, operation and decommissioning of the action. This must include measures:

(1) to prevent entrapment and mortality of EPBC Act listed species within areas that are excavated including foundation excavation for transmission towers and substations and cable trenching during the construction of the project

(2) for surveying, monitoring and removing and relocating any trapped fauna identified during monitoring. Surveys must be undertaken by a suitably accredited fauna spotter/catcher in areas prior to commencement of backfilling activities.

(B) a monitoring program to determine the success of management measures that informs adaptive implementation of the SMP for the duration of this approval

(C) details of how proposed management measures take into account relevant approved conservation advices and are consistent with the measures contained in relevant recovery plans and threat abatement plans.

(d) For the koala (*Phascolarctos cinereus*) the SMP must incorporate the following measures to mitigate potential impacts to the koala, as a minimum:

(i) a 40 km/hr speed limit must be enforced within the project area where non-gazetted roads or tracks are located within and/or adjacent to koala habitat areas

(ii) clearing within koala habitat must be undertaken sequentially and outside of peak breeding season as a priority

(e) For the squatter pigeon (*Geophaps scripta scripta*) the SMP must incorporate the following measures to mitigate potential impacts to the squatter pigeon, as a minimum:

(i) areas of potential habitat must be flushed immediately prior to any clearing works

(ii) a register of squatter pigeon sightings must be maintained, and warning signs provided at suitable intervals along access tracks which pass through areas of confirmed presence

(f) For the night parrot (*Pezoporus occidentalis*) the SMP must incorporate the following measures to mitigate potential impacts to the night parrot, as a minimum:

(i) permanent monitoring of site must be undertaken where a night parrot is detected during construction and for a 12-month period post-construction

(ii) high visibility tags and reflective tape must be installed at suitable intervals along transmission line infrastructure where it passes through areas of night parrot habitat

(g) For the black-throated finch (*Poephila cincta cincta*) the SMP must incorporate the following measures to mitigate potential impacts to the black-throated finch:

(i) no clearing of vegetation within 400 m of nesting sites

(ii) clearing near nesting sites must occur outside of peak breeding season

(h) For the black ironbox (*Eucalyptus raveretiana*) the SMP must incorporate the following measures to mitigate potential impacts to the black ironbox:

(i) any trimming to occur outside of the flowering and fruiting period for this species.

(i) The approved SMP must be implemented.

Condition 6. Rehabilitation requirements

(a) Following construction, the approval holder must actively rehabilitate all **rehabilitation areas** to reinstate the pre-disturbance vegetation community, using endemic native species appropriate to their position in the landscape and in accordance with the Environmental Impact Statement.

(b) To ensure the establishment and long-term sustainability of rehabilitated areas in accordance with condition 6(a), the approval holder must:

(i) ensure rehabilitated areas achieve the completion criteria within 12 months of completion of the action; and

(ii) monitor rehabilitated areas to ensure completion criteria, once met, are maintained for a further minimum of 12 months.

Definitions

Approved conservation advice/s means a conservation advice approved by the Minister under section 266B(2) of the EPBC Act.

Commencement of the action/commencing the action means the first instance of any specified activity associated with the action including clearance of vegetation and construction of any infrastructure. Commencement does not include minor physical disturbance necessary to:

- undertake pre-clearance surveys or monitoring programs
- install signage and/or temporary fencing to prevent unapproved use of the project site
- protect environmental and property assets from fire, weeds and pests, including erection or construction of fencing and signage, and maintenance or use of existing surface access tracks.

Condition of habitat means the baseline condition of suitable habitat for listed threatened species determined from ecological surveys and with consideration of relevant Departmental documents including, but not limited to, EPBC Act referral guidelines, listing advices, approved conservation advices and recovery plans.

Construction means the erection of a building or structure that is or is to be fixed to the ground and wholly or partially fabricated on-site; the alteration, maintenance, repair or demolition of any building or structure; preliminary site preparation work which involves breaking of the ground (including pile driving); the laying of pipes and other prefabricated materials in the ground, and any associated excavation work; but excluding the installation of fences and signage.

Department means the Australian Government agency responsible for administering the EPBC Act.

Environmental Management Plan Guidelines means the Environmental Management Plan Guidelines (2014), or subsequent revision.

Environmental Offsets Policy means the EPBC Act Environmental Offsets Policy (2012), or subsequent revision, including the Offset Assessment Guide.

EPBC Act means the Environment Protection and Biodiversity Conservation Act 1999 (Cth).

Impact/s/ed means as defined in section 527E of the EPBC Act.

Independent audit/s means an audit conducted by an independent and suitably qualified person as detailed in the EPBC Act Independent Audit and Audit Report Guidelines (2015), or subsequent revision.

Listed threatened species and communities means a threatened fauna and flora species and ecological communities listed under the EPBC Act for which this approval has effect, including the:

- Koala (Phascolarctos cinereus)
- Squatter pigeon (*Geophaps scripta scripta*)
- Black-throated finch (*Poephila cincta cincta*)
- Night parrot (*Pezoporus occidentalis*)
- Australian painted snipe (*Rostratula australis*)
- Painted honeyeater (*Grantiella picta)*
- Julia Creek dunnart (*Sminthopsis douglasi*)
- Red goshawk (*Erythrotriorchis radiatus*)
- Ornamental snake (*Denisonia maculata*)
- Plains death adder (*Acanthophis hawkei*)
- Pink gidgee *(Acacia crombiei)*
- Black ironbox *(Eucalyptus raveretiana)*
- Waxy cabbage palm *(Livistona lanuginose)*

Legally secure means to secure a legal agreement under relevant Queensland legislation, in relation to a site, to provide enduring protection for the site against development incompatible with conservation.

Maximum disturbance limits mean maximum acceptable significant residual impact for listed threatened species habitat informed by the significant residual impacts as determined from evaluation of information presented in the Environmental Impact Statement for the action.

Micro-siting means the determination of final siting and configuration of temporary construction activities and operational infrastructure (i.e. transmission towers) to reduce the development footprint and to further minimise impact on ecological values within the project corridor.

Minister means the Australian Government Minister administering the EPBC Act including any delegate thereof.

Offset attributes means an '.xls' file capturing relevant attributes of the offset area, including:

- EPBC Act reference number;
- physical address of the offset area;
- coordinates of the boundary points in decimal degrees;
- listed threatened species that the offset compensates for;
- any additional protected matters that are benefiting from the offset; and
- size of the offset in hectares.

Plan/s means any of the documents required to be prepared, approved by the Minister, and/or implemented by the approval holder and published on its website in accordance with these conditions (includes action management

plans and the Spring Gully North-West and North-East Project Environmental Constraints Planning and Field Development Protocol).

Protected matter/s means a matter protected under a controlling provision in Part 3 of the EPBC Act for which this approval has effect.

Recognised guidelines mean Commonwealth or state endorsed survey and assessment guidelines relevant to the protected matters, or as otherwise approved by the Minister.

Recovery plans means a recovery plan made or adopted by the Minister under the EPBC Act.

Rehabilitation areas means land temporarily cleared for project construction works and not required for use during operation

Suitably qualified person means a person who has professional qualifications, training, skills and/or experience related to the nominated subject matter and can give authoritative independent assessment, advice and analysis on performance relative to the subject matter using the relevant protocols, standards, methods and/or literature.

Appendix 4. Proponent commitments

See next page.

Commitment		Section of the EIS
Volume 2		
Chapter 1 Introduction		
C1	CuString will plan, implement and monitor the mitigation and management measures outlined of the Project Framework Environmental Management Plan and Field Development Plan to minimise and avoid adverse environmental impacts.	1.6.1
C2	CuString and their technical service partners and Construction Contractors are committed to obtaining all relevant approvals, including all necessary environmental approvals, prior to the commencement of construction relating to the approval trigger and comply with all required approvals and conditions for the Project.	1.7
Chapter 2 Revised Project description (Volume 4 EIS Supplement, Attachment B)		
C3	Transmission towers will be designed to maintain a mid-span clearance of the transmission line above local terrain in compliance with Queensland legislation.	1.9
C4	The potential locations of the associated infrastructure will be finalised during the detailed design of the Project. Sites will be determined after careful consideration of all physical constraints such as sensitive environmental areas, rock/soil types, significant watercourse/infrastructure crossings, existing land use. The finalisation of these sites will be achieved through ongoing negotiations with landholders and consultation with relevant government agencies as appropriate e.g. local councils, Department of Transport and Main Roads (TMR) and the Department of Community Safety.	1.9
C5	The construction program will be structured so that where possible, peak construction activities located in areas susceptible to flooding are programmed to occur outside of the forecast seasonal wet weather period. Areas at high risk of flooding and erosion will be targeted for construction during the dry months.	2.2.2 5.1
C6	A Road Use Management Plan (RUMP) will be developed as part of the MID and secondary approvals process and will be implemented prior to and during construction as outlined in the RUMP. Consultation will occur with the relevant transport authorities, such as DTMR, Queensland Rail and local councils during the development of the RUMP.	2.2.3

Commitment		Section of the EIS
C7	Access tracks will generally be contained within the transmission line easement where practical. Existing cleared access tracks are to be preferred for construction use where practical. The access tracks for the Project will be constructed to a standard suitable for dry weather use for 4WDs (and variable terrain heavy machinery) at low speed.	3.2
C8	Suitable weed control measures will be implemented during construction and operation of the Project. The Project will consult with local government weed and pest management officersand landholders during the development of Biosecurity Plans for the Project.	3.2
C9	Cultural heritage clearance for the Project will be managed in accordance with the Cultural Heritage Management Plans (CHMPs) being developed for the Project.	4.4
C10	Where work is proposed to be conducted in proximity to a sensitive receptor, the timing of construction will consider thenoise, dust, vibration and light impacts of the construction process and of access issues.	5.1.2
C11	A complaint handling process, including a complaints register, will be developed prior to commencement of construction as part of the Stakeholder andCommunity Engagement Plan, which will include regular reviews and reporting procedures.	5.1.2
C12	At laydown/delivery areas along the transmission line, deliveries will occur in a manner not to cause nuisance to a sensitive receptor (occupier of a building) outside of the hours of 6.30 am to 6.30 pm Monday to Saturday (as per the requirements of the Environmental Protection Act 1994).	5.1.2
C13	Appropriate vegetation management measures shall be incorporated in the Construction Environmental Management Plan. These shall include the presence of qualified fauna spotter/catcher(s) during clearing and identification and delineation of vegetation to be preserved.	5.2.2, 6.4 Vol 4, 4.3
C14	Vegetation clearing will typically be conducted by bulldozers. Heavy duty mulchers may also be used. More refined hand or mechanical clearing methods will be employed for smaller clearing operations in environmentally sensitive areas as defined in the Construction Environmental ManagementPlan which may include some riparian zones. Vegetation felled near watercourses will be kept out of the channel.	5.2.2
C15	The Project will consult landholders and other stakeholders on appropriate uses for timber of commercial value.	5.2.2

Commitment		Section of the EIS
C16	Ongoing consultation with Landholders and resource tenement holders will continue through development of the Project in accordance with land access protocols. This consultation process may include assessment of alternative corridor routes, outcomes of all realignment must be done in accordance with project change request criteria.	5.2.2 Vol 4 Attachment A (sub 22.01, 22.08)
C17	The Construction Environmental Management Plan shall include erosion and sediment control measures which takes intoconsideration the International Erosion Control Association's Best Practice Erosion and Sediment Control Guidelines (IECA, 2008). The plan will include onsite drainage, stormwater runoff control, vegetation clearing, earthworks, site exit and egress points and soil stockpile management.	5.2.3, 6.4, 9.5 Vol 4, 4.7
C18	A plan for the handling and temporary storage of topsoil and spoil during construction activities at the transmission tower sites will be developed as part of the Construction Environmental Management Plan.	5.2.4
C19	In the unlikely event that blasting is required, a licenced contractor will be required to manage all health and safety risks.	5.2.4
C20	Helicopters will be employed as the primary means of installing insulator strings, conductor draw lines and overhead earthwires to reduce additional vehicle movements and compaction of soils.	5.2.6
C21	The transmission network will be subject to a detailed testing and commissioning plan and a number of performance trials to verify the integrity and safety of the transmission lines and substation infrastructure during the commissioning phase and prior to operation. A series of system tests will be conducted to ensure power quality performance and will fulfill any required Australian Energy Market Operator testing.	5.4
C22	A workforce attraction and retention strategy will be used to assist in establishing and stabilising the workforce for the construction of the Project.	6.1.1
C23	CuString will work with local government councils, education and training providers, and labour force suppliers to developa local business participation strategy and an Indigenous Participation Plan, prior to construction, that will reflect: • Maximising local participation and employment (including work readiness if appropriate) • Maximising Indigenous participation and employment • Employment of apprentices and trainees (including work readiness if appropriate).	6.1.1 Vol 4, 2.0

Commitment		Section of the EIS
C24	Construction camps will be developed (as needed) by specialist contractors that will construct and operate the camps. Thecontractors will be responsible for ensuring the facilities meet all applicable occupational health and safety requirements, including those relating to food preparation and storage, ablutions and water quality, vector and vermin control and safety and emergency services. All camps will be built to current industry standards and the requirements of local government laws and approval conditions. Meetings will be held with stakeholders from each LGA regarding construction camp locations in accordance with consultation strategies and protocols to engage with regional community hubs and LGA's chamber of commerce for future project development/participation opportunities. Development approvals for workers accommodation will be obtained as part of individual Ministerial Infrastructure Designation Proposals (MID) aligning with the construction hub areas described in the SEIS. However, where agreed with an LGA and suitable to do so, an application for Material Change of Use (MCU) assessable under a local planning scheme may be an alternative for some workers accommodation sites.	6.1.2 Vol 4 Attachment A (sub 5.09)
C25	A Rehabilitation plan that outlines measures for rehabilitating temporary construction sites and associated infrastructure (including temporary construction camps or clearing around substations), following completion of the construction schedule will be developed.	6.1.2
C26	A Rehabilitation plan outlining the requirements for the rehabilitation of land cleared within the corridor selection during construction will be provided prior to construction. Site and stage-specific rehabilitation sub-plans will also be developed, and include tower assembly areas, tower pads, brake and winch sites, CEV Huts and temporary access tracks not required during the operation and maintenance of the transmission infrastructure.	Vol 4, 4.4
C27	Relevant approvals will be obtained for the use of existing or new bores to access water for the project. Where existing bores are used to access water for the Project, a pump test and drawdown investigation will be undertakento ensure adequate yields will be available for construction use and for surrounding users. Ongoing monitoring will be undertaken and a management plan developed if yields decrease.	7.1.4
C28	Water supplied for temporary camps will comply with the Australian Drinking Water Guidelines (2011), version 3.5.	7.1.4
C29	An adequate communications system will be established as part of the emergency planning and responseprocedures developed for the Project.	7.2.1

Commitment		Section of the EIS
Chapter 4 Legislation and approvals		
C30	CuString will pursue a designation of premises by the Treasurer, Minister for Infrastructure and Planning or a local government for deployment of infrastructure in accordance with Planning Act, Chapter 2, Part 5.	4.1.7 Appendix M
C31	CuString will pursue regulatory approval to be licensed as a transmission authority and an electricity entity.	4.1.7
C32	The final corridor selection for the Project will require an easement of 120 m in width, for the Renewable Energy Hub and CopperString Core transmission line sections to allow for future duplication, 120 m in width for the interconnecting lines with existing circuits at Ergon's Chumvale Substation and 60 m in width for the Mount Isa Augmentation and southern connections to Selwyn and Woodya. Prior to the construction of the transmission network, the easements required for the Project will need to have been acquired by CuString.	4.1.7
Chapter 5 Land		
C33	CuString will consult with the owners of any other infrastructure (rail, road, electricity, gas and water) that the Project maycross to detail the transmission line crossing, then once the detailed design and staging of the Project is finalised arrangeany planned outages.	5.4
C34	Final design of the Corridor selection will avoid or be suitably distanced form areas including areas of: • Cultural significance • Contaminated lands • Historical working and existing infrastructure.	5.4
C35	In circumstances when it is not possible to avoid, disturbances will be minimised, mitigated and remediated.	
C36	CuString commits to obtaining relevant Commonwealth, state and local approvals for the construction and operational phases of the Project prior to construction.	5.4
C37	CuString will prepare and implement an Environmental Management Plan as part of the additional management plans prior to construction.	5.4
C38	Separation distances to sensitive land uses will be maintained as far as practical to ensure amenity to visitors and local residents are not adversely impacted	5.5

Commitment		Section of the EIS
C39	There will be ongoing engagement and consultation with landholders and stakeholders to exchange information on Project infrastructure design and construction to investigate how land use conflicts can be managed.	5.5
C40	Rural land fragmentation and disturbance to landholder practices will be avoided and ongoing consultation with landholders will occur during the detailed design to minimise and mitigate disruptions to agricultural production.	5.5
C41	Exploration and mining lease land will be avoided as far as practicable to mitigate disruptions to current and future mining operations. Consultation with tenure holders will be ongoing during the design and construction phases of the Project to consider how to avoid and minimise disruptions to existing mining operations.	5.5
C42	Infrastructure placed within Stock routes will be avoided as far as practicable to mitigate disruptions to operation of stock routes.	5.5
C43	Further investigations prior to construction will be undertaken to ensure that disused and abandoned workings will be avoided as far as practical to mitigate risk to Project personnel and property.	5.5
C44	Disturbance to potentially contaminated land will be avoided as far as practical through discussion with landholders to further delineate known sites and identify potential contamination on properties not listed on the EMR. Site Project infrastructure and activities will be located away from potentially contaminated land as far as practical.	5.5
C45	Further consultation with landholders and other stakeholders such as the Department of Defence will be undertaken to further define UXO risk.	5.5
C46	In-principle approval for the construction of the Project prior to registration of easements on State leasehold land will be sought from DNRME. In-principle approval should be appropriately conditioned with consideration to landholder consent, cultural heritage and native title assessments and insurance requirements.	5.5
C47	Landholder agreements will be secured and managed in accordance with Volume 3 Appendix E Land acquisition protocol.	5.5
C48	Mitigation and management measures detailed in Volume 3 Appendix O Visual amenity will be reviewed and considered in detailed design including tower heights, tower placement and vegetation screening for substations.	5.5
Chapter 6 Geology and soils		
C49	An unexpected finds protocol will be developed as part of the environmental management plan with procedures to follow inthe event of discovery of fossils or items of heritage significance.	6.4

Commitment		Section of the EIS
C50	CuString will develop Road Use and Traffic Management Plans which will address wet weather aspects associated with theuse of unsealed access tracks. Many soils in the study area are susceptible to varying types of erosion. To mitigate this impact, an erosion and sedimentcontrol plan will be developed prior to construction and implemented. These plans will include measures to avoid, manage or mitigate potential risk to soils, including specific reference to management/mitigation of risks associated with salinity, specifically providing evidence of no clearing in salinity expression areas. This will be used in conjunction with a vegetation management plan and rehabilitation plan which will include actions suitable to manage or prevent cumulative impacts to the geology and soils.	6.4 Vol 4 Attachment A (sub 11.05, 11.14)
Chapter 7 Flora and fauna		
C51	Direct impact to areas of high ecological value will be avoided or minimised through the process of corridor realignments or spanned across wherever possible using higher towers as appropriate to the ecological values and the terrain constraints. In areas of high ecological value this will enable vegetation below 20 m to be retained and mature trees over 20 m may be trimmed if necessary for safety and operational requirements.	7.5
C52	Direct impact to watercourses by transmission towers will be avoided by implementing buffer distances and sighting towers so the alignment can completely span waterways. No towers will be located within a watercourse or its riparian zone.	7.3.11
C53	Micro-siting of towers will occur to avoid key localised ecological resources such breeding, nesting or refuge sites for conservation significant species including but not limited to the black-throated finch (southern), squatter pigeon (southern), Julia Creek dunnart, ornamental snake, greater glider and koala.	7.3.11
C54	In areas of importance for conservation significant species where high levels of fauna connectivity is unavoidably impacted, retention of remnant vegetation strips will be considered to maintain connectivity and reduce habitat fragmentation / isolation. This will be undertaken in areas where the vegetation strips will not impact the operational safetyof the network infrastructure.	7.4.1
C55	Temporary and permanent structures and infrastructure will be located in areas of non-remnant or least concern vegetation to minimise clearing of high value vegetation (in particular of concern)	7.4.1

Commitment		Section of the EIS
C56	A Flora and Fauna Management Plan will be developed prior to construction commencing. The Flora and Fauna Management Plan will include details relevant to the general management of flora and fauna impacts as well as Species Management Plans for identified conservation significant species that will be impacted. Where necessary, the Flora and Fauna Management Plan will incorporate flora and fauna monitoring activities. Specifically, ongoing monitoring and surveyrequirements necessary to assess the persistence and health of conservation significant populations will be outlined (i.e. EVNT flora and fauna species impacted by the Project). For more information on the flora and fauna management plan, refer to Volume 3 Appendix O Environmental management plan.	7.5
C57	The Construction Environmental Management Plan will include rehabilitation measures for areas to be temporarily disturbed during construction will be developed prior to construction commencing with the overall aim of minimising the amount of land disturbed at any one time during the construction of the Project. As soon as practicable after cleared areas are no longer required (i.e. temporary construction camps, laydown areas, quarries, borrows, turning circles and access tracks), rehabilitation will commence. Temporary construction infrastructure will be decommissioned and removed from site. The sites will then be rehabilitated. Rehabilitation measures will include: • Removal of potentially hazardous stored substances • Remediation of any contaminated areas • Grading of disturbed surface to a state generally consistent with a natural topography (if required) and to ensure thatpermanent drainage lines are not compromised • Application of topsoil and revegetation with species adapted to the site. • Requirements and mechanisms for post-construction monitoring of rehabilitation success. Certain vegetation cleared during construction may be chipped or mulched and used in the rehabilitation of erosion proneareas. Any temporary watercourse crossings will be rehabilitated to a similar profile to minimise flood erosion risks. The Construction Environmental Management Plan include procedures for revegetation species selection, ground preparation and sowing/planting.	6.1.2, 6.4, 7.5, 8.5 Vol 4 Attachment A (sub 17.11)
C58	The corridor selection will be located to avoid disturbances within sensitive areas mapped as wetlands and semi-evergreen vine thicket.	7.5
C59	A Construction Environmental Management Plan which includes weed and pest management measures will be developed prior to construction commencing. The plan will include details relating to the monitoring, management and, where necessary, treatment of weeds, disposal of green waste, and vehicle/plant weed wash down protocols.	7.5 Vol 4 Attachment A (sub 20.02)

Commitment		Section of the EIS
C60	Pre-clearance surveys will be undertaken during the detailed design phase within known and potential habitat areas of conservation significant species and within significant communities such as Of Concern REs and Essential Habitat in order to plan infrastructure placement, tower heights, spans and resulting clearing to avoid known occurrences and habitat for conservation significant species.	7.5 Vol 4 Attachment A (sub 11.16)
C61	The extent of vegetation clearing (and no-go areas) will be clearly identified on construction plans and in the field using high visibility fencing or flagging in the vicinity of high conservation significant areas. Clearing extent will be communicatedto construction supervisors.	7.5
C62	Where infrastructure must cross waterways, areas of existing disturbance (i.e. existing tracks or clearing) will be used. Where this is not practicable, the Project footprint will be minimised and the stumps of large habitat trees retained. Waterway crossings in known habitat for conservation significant flora and fauna species will aim to avoid occurrences of conservation significant flora species. Transmission lines will span across the riparian habitat corridors wherever possible.	7.5
C63	A CEMP will be prepared and implemented for standards such as weed hygiene, erosion, fuels and hazardous substances, fire, etc. The CEMP will include protocols to limit injury and mortality to fauna including management of risksassociated with open excavations, trenching, waterbodies and responses and reporting for roadkill and adverse incident protocols	7.5 Vol 4 Attachment A (sub 20.02)
C64	A Traffic Management Plan will be developed for the construction site with designated access routes, speed limits and sensitive ecological areas (i.e. particularly areas where squatter pigeons have the potential to occur on access roads).	7.5 Vol 4 Attachment A (sub 5.03, 12.03, 12.06)
C65	Erosion and sediment control measures will be developed as part of the CEMP for the Project.	7.5 Vol 4 Attachment A (sub 17.11)
C66	A Waste management procedure will be prepared as part of the CEMP. These will detail the location and specifications for disposal and removal of waste from the construction site. Responsible waste management practices (e.g. not leaving out food waste and not feeding wildlife) will be implemented and followed by all construction personnel. All waste will be stored in secure temporary holding containers and transported off site.	7.5 Vol 4 Attachment A (sub 14.09)

Commitment		Section of the EIS
Chapter 8 Biosecurity		
C67	Management strategies with reference to biosecurity will be developed to reflect the level of risk proposed for Project activities and Project work fronts.	8.4.6
C68	All relevant personnel working in the field on the Project will receive an induction regarding biosecurity matters and management requirements relevant to their specific work activities and Project work front.	8.4.6
C69	A weed and pest biosecurity survey will be undertaken over of the corridor selection within six months of construction commencing in that section.	8.5
C70	The Construction Contractor(s) will undertake a detailed assessment of biosecurity risks associated with specific work activities and construction methods	8.5
C71	Prior to leaving their point of origin for access to the Project site, all vehicles, plant, equipment and machinery shall be cleaned down and be accompanied by a current and certified Biosecurity Declaration Form from the entity responsible forthe clean down.	8.5
C72	CuString will develop and implement a movement control plan and species specific biosecurity treatment procedures.	8.5
C73	Biosecurity will be managed in accordance with the Construction Environment Management Plan, Prior to leaving a Project work front, or moving between Project work fronts or biosecurity risk areas, allvehicles, plant, equipment and machinery shall undergo clean down at designated facilities and a new Biosecurity Declaration Form completed. Any specific landholder requirements will also be noted as part of the clean down requirements.	8.5
Chapter 9 Water resources and water quality		
C74	Access tracks, stockpiles, and laydown/delivery areas will be located as far as practicable away from important wetlands,waterways and drainage lines.	9.4.1
C75	Taller transmission line structures will be employed near waterways to ensure that spanning of riparian vegetation is achieved where practicable and disturbance is minimised.	9.4.1
C76	Riparian vegetation will be retained where practicable to maintain waterway bank stability.	9.4.1
C77	Ground disturbance will be minimised wherever practical by using existing cleared areas for construction laydown/deliveryareas and material stockpiles.	9.4.1

Commitment		Section of the EIS
C78	All disturbed areas will be rehabilitated as soon as practicable in order to establish ground cover and limit the duration thatdisturbed ground surfaces are exposed to erosive processes.	9.5
C79	A construction Water Plan will be developed during the detailed design phase with consultation of Department of Regional Development, Manufacturing and Water (DRDMW). This plan will include all sources of taking water, identifying locations where water will be acquired from, amount of water (outlining maximum limits), locations of potential water interference, and any new or modified works that will capture overland flow for construction purposes and associated approvals. Water resource objectives and mitigation controls during the project will be outlined in the Water Plan as well as being in accordance with the Framework EMP.	9.5 Vol 4 Attachment A (sub 15.12)
C80	Careful consideration of site constraints and placement of towers and associated infrastructure to avoid/minimise direct disturbance to water features.	9.5
C81	Waterway crossings the Project traverses will be identified as waterway barrier works, and existing access tracks will be utilised wherever possible for access to the Project and when crossing waterways comply with DAF Accepted development requirements for operational work that is constructing or raising waterway barrier works.	9.5 Vol 4 Attachment A (sub 17.31)
C82	Use existing licensed and authorised sources of construction material (e.g. aggregate) from local suppliers.	9.5
C83	Implement best practice erosion and sediment controls during construction.	9.5
C84	Design temporary and permanent infrastructure with industry standard stormwater management controls.	9.5
C85	Locate permanent infrastructure away from flood prone areas where practicable or provide appropriate flood immunity in accordance with design requirements.	9.5
C86	Utilise existing licenced and authorised water sources during construction in consultation with Council, DNRME and landholders	9.5
C87	Transport, store, use and dispose potentially contaminating substances in accordance with manufactures specifications, legislative requirements and industry best practice	9.5
C88	Design, construct, operate and decommission STPs in accordance with manufactures specifications, legislative requirements and industry best practice.	9.5

Commitment		Section of the EIS
C89	During the project design and preconstruction phase, waterway assessments (in addition to those already undertaken during the EIS Phase) will be undertaken that will capture on ground physical and hydrological fish habitat attributes to confirm whether a particular drainage or waterway feature is a defined waterway that provides for fish passage. Theses assessment will be undertaken we reference to the attributes that define a waterway as described in the DAF factsheet 'what is a waterway' (DAF,2017). A pre-lodgement meeting with DAF to assist in the determination of potential waterway barrier works that might be triggered as part of the project. Where the project requires crossing works within a DAF waterway and those works cannot meet the ADR a a development approval will be obtained for waterway barrier works prior to commencement of construction in the waterway.	9.5 Vol 4 Attachment A (sub 17.35)
Chapter 10 Air and greenhouse gas		
C90	CuString will consider implementation of the following mitigation opportunities for the management of air quality: • Development of dust and stockpile management procedures within the Environmental Management Plan • Undertake progressive rehabilitation and stabilisation of disturbed areas in accordance with a rehabilitation plan • Maintain a complaints register for the management and tracking of complaints • Development of a Greenhouse gas offset plan.	10.4
C91	CuString will consider implementation of mitigation measures to reduce the production of greenhouse gases with regardsto fuel combustion and gas-insulated electrical components. Offset strategies will also include the development of a GHG Offset Plan and consideration of options regarding GreenPower sources from a renewable source or contributions to another credited offset program. This strategy willdepend on Federal and State climate change policy current at the time the Project is approved.	10.5 Appendix V
Chapter 11 Noise and vibration		
C92	Traffic Control Plans will be prepared immediately prior to construction by the Construction Contractor which will illustrate the access routes to the site for points along the corridor selection.	11.4
C93	Targeted landholder communication will be conducted prior to especially noisy activities such as blasting activities (if required) and helicopter (aerial) stringing of lines.	11.4

Commitment		Section of the EIS
C94	A complaints register will be maintained. Should non-vexatious noise complaints be received, noise monitoring may be undertaken at the locations concerned. Reasonable and feasible measures will be implemented to reduce noise impacts.	11.4
Chapter 12 Waste management		
C95	Waste will be dealt with following the waste management hierarchy, where avoidance of waste generation is the most desirable course of action and disposal of waste is the least desirable course of action.	12.5
C96	Waste generation will primarily be mitigated and managed by reducing (avoiding), recycling and reusing. All waste is expected to be transported to external licensed waste management facilities, these will be determined during the MID process.	12.5 Vol 4 Attachment A (sub 14.23)
C97	Waste management procedures will be prepared as part of the CEMP that will include specific measures for storing, transporting and disposing of wastes developed in consultation with operators of local waste management facilities.	12.5 Vol 4, 4.9
C98	Where necessary, restricted invasive plants material will be disposed in accordance with the biosecurity measures in the CEMP.	12.5
Chapter 13 Traffic and transport		
C99	During construction, traffic impacts will be managed in accordance with the mitigation measures outlined in the Traffic management plan.	13.5
C100	A Traffic management plan will be developed for the Project by the haulage contractor and will include consultation with the relevant transport authorities (including DTMR, QR and local councils). This plan will include a detailed rail impact assessment, supplied to Queensland Raildetailing the traffic volumes expected to traverse level rail crossings, the frequency and period of operation. This will include peak traffic volumes, such as daily workforce movements in addition to heavy, over dimensional vehicles that willcross rail structures including level crossings.	13.6 Vol 4 Attachment A (sub 27.14)
C101	A Road Use and Traffic management plans will be developed for the Project and will include consultation with the relevanttransport authorities, such as DTMR, Queensland Rail, Department of Education, and local government councils.	13.6
C102	CuString and their technical service partners and Construction Contractors are committed to obtaining all relevant approvals, including all necessary environmental approvals, prior to the commencement of construction and complying with all required approvals for the Project.	13.6

Commitment		Section of the EIS
C103	A Traffic Impact Assessment (TIA) which complies with the Department of Transport and Main Roads' Guide to Traffic Impact Assessment to the Department of Transport and Main Roads will be provided at the beginning of the project's subsequent approval (currently anticipated to be a request for Ministerial Infrastructure Designation). Detailing additional information on design of road crossings in accordance with DTMR requirements.	13.6 Vol 4 Attachment A (sub 27.12)
Chapter 14 Social		
C104	Opportunities for integration of the workforce into local communities may be identified through meetings between a representative of the Construction Contractor and the local council and chamber of commerce within the regional community hubs to manage or alleviate anypositive or negative interactions between the Project workforces and the community. These meetings will occur in accordance with consultation strategies and protocols and will involve regional development organisations for future project development/participation opportunities.	14.4.3.2 Vol 4 Attachment A (sub 5.12)
C105	CuString will consider all Project design processes available to reduce the consequences of potential social impacts.These include the location of construction camps and location of laydown areas and concrete batching plants.	14.5.3
C106	It is CuString's strong preference that a voluntary and commercial agreement is reached with landholders in the acquisitionof an interest (easement) required for the Project. This process will follow detailed land access negotiations with landholders regarding the possible alignment for the corridor selection and other specific issues regarding current and future land uses or operations.	14.5.3
C107	The land access management plan will identify agreed access arrangements during construction and operation, rehabilitation requirements after construction and communication arrangements for each property.	14.5.3
C108	A community and stakeholder engagement plan will guide engagement with stakeholders during construction of the Project. The plan will act as a key mechanism to foster dialogue with communities and stakeholders and manage and monitor potential social impacts and opportunities of the Project. The Plan will include: • Identification of key stakeholders • Key messages • Engagement methods and activities • Complaints management procedure.	14.5.3

Commitment		Section of the EIS
C109	The Workforce management plan will include a: • Training and education program that will maximise employment including indigenous employment and trainindigenous and non-indigenous workers who require additional qualifications to work on the Project. • Code of conduct that describes the expected standard of behaviour for all personnel (construction and operation). • Measures to develop a strong mental health culture and promote wellbeing within the workforce.	14.5.3
C110	The local and Indigenous business participation plan will maximise opportunities for local and Indigenous businesses though relationships with local businesses, suppliers and key stakeholders and giving preference to local, regional andIndigenous-owned businesses in tendering evaluation.	14.5.3
Chapter 15 Cultural heritage		
C111	Agreeing and executing a Cultural Heritage Management Plans (CHMP) with each Aboriginal party to identify a clear process for managing Aboriginal cultural heritage, including cultural heritage survey and management processes. Ongoing engagement with local Aboriginal and Torres Strait Islander Organisation and Groups will be in accordance with developed CHMP's. The mitigation measures included within the CHMPs will be comprehensive and entail a number of possible procedures thatwill include (but not be limited to): • In the first instance, avoiding Indigenous cultural heritage, wherever practical; • Carrying out further detailed field investigations; • Collecting and relocating cultural heritage items, as agreed with the relevant Aboriginal parties	15.4 Vol 4 Attachment A (sub 5.13)
C112	Inform personnel and contractors of the appropriate measures to adopt in the event of the discovery of an archaeological artefact	Vol 4, 4.11
C113	CuString will develop and implement an unexpected finds procedure as part of the CEMP with procedures for stopping work in the event of the discovery of an archaeological artefact until a suitably qualified cultural heritage practitioner can assess the item/site and follow a process of identification and recording. In addition, all contractors will be required to undergo cultural heritage inductions to ensure awareness of obligations in preserving significant cultural heritage. The inclusion of cultural heritage awareness training in inductions and procedures for managing archaeological finds in the construction environmental management plan.	15.4 Vol 4 Attachment A (sub 14.11)

Commitment		Section of the EIS
C114	Requirements outlined by the Qld Heritage Act 1992 (section 89) will be followed when reporting and managing non-indigenous cultural heritage finds.	Vol 4, 4.11
Chapter 16 Economics		
C115	The Project will include a Training Policy and an Indigenous Economic Opportunities Plan to ensure maximise local employment, training and business supply opportunities for Aboriginal and Torres Strait Islander Queenslanders.	16.6
C116	CuString will aim for at least 15 percent of the total man-hours to be undertaken by apprentices and/or trainees and through other workforce training. Head office and administration roles will work Monday to Friday to minimise staff uploadcosts associated with weekend work and to attract local workers.	16.6
C117	Across all aspects of the Project, CuString will strive to include members of Indigenous communities and people with a disability. Skillsassessment and recruitment and training programs will be offered. Refer to Local and Indigenous Employment, Engagement and Training Plan (Volume 4 EIS Supplement, Attachment I)	16.6
C118	As the Project is based in a regional area and travel will include off road driving, vehicle operation training will be a pre-requisite for some site-based workers and sub-contractors.	16.6
C119	CuString envisages that the admin, camp cleaning/kitchen hand roles will be filled by local people and businesses. Employees will be given training and develop new skills in reception, administration, cost control systems and software packages as required.	16.6
C120	The following training programs will take place: • Suitable numbers of people on site will be first aid officers. The number will depend on the crew size for each work front. • Training and development programmes will be offered to office staff, administrators as well as site engineers and supervisors	16.6

Commitment		Section of the EIS
C121	The Project will engage the following high-level strategies to operationalise this policy: • Recognise that involving local industry in projects provides economic benefits to all parties. • Ensure that Queensland and Australian suppliers, contractors and manufacturers are given full, fair and reasonable opportunity to tender and participate in all stages of the Project. • Use Australian standards and codes in the formulation of specifications, tenders and the letting of contracts (exceptwhere it is unreasonable to do so). • Seek to maximise levels of goods and services, including design services, from local companies where they are competitive with respect to cost, quality and timeliness. • Seek to incorporate the Queensland Charter for Local Content into contracts entered into with third parties for thesupply of goods and services. • Encourage private sector project proponents, who are not formally subject to the provisions of the policy, to apply the principles espoused in the policy to their projects on a voluntary basis as 'good corporate citizens'.	16.6
Chapter 17 Hazards, health, and safety		
C122	A Road Use Management Plan (RUMP) should be prepared to address the increase of traffic on local roads and highways during construction. This will include but is not limited to details about movements of heavy vehicles, school zone impacts including school bus routes, impacts to access to state-owned forest products / commercial timber/ quarry material, transport of construction workers, and details regarding access to transmission line easements.	17.5 Vol 4 Attachment A (sub 17.30)
C123	The hazards and risks identified during the risk assessment process will be maintained within a risk register that is continually updated and relevant. The risk register will be reviewed at least annually to ensure that high level hazards and risks continue to be adequately controlled.	17.5

Commitment		Section of the EIS
C124	CuString will develop and implement a Risk Management Plan which will include, but not be limited to the following: • Application of Design and Construction Standards • Safety in Design Reviews • Construction Safety Management Plans • Construction Environmental Management Plans • Construction Quality Management Plans • Operational Safety Management Systems • Operational Environmental Management Plans • Asset Management Strategy and Plans • Bushfire Management Plan • Emergency Response Planning • Stakeholder Communications and Engagement Plan.	17.5, Vol 4, 4.13, Attachment I (Additional Management Plans)
C125	The RUMP will be developed in consultation with DTMR and local government councils. Contractors will develop and implement specific plans for oversized loads.	17.3.9

Commitment		Section of the EIS
C126	Development of environmental and safe work methods (ESWMS) in accordance with industry best practice to minimise the risk of exposure to electrified equipment during the operation of the Project. The Queensland Electrical Safety Office (ESO) and Energy Networks Australia (ENA) have separately published a number of guidelines and codes that will be adopted to minimise the risk to personnel. These include: • Australian Standard AS 5804 (Series) High-voltage live working • Electrical safety code of practice 2013 - Managing electrical risks in the workplace • Electrical safety code of practice 2020 - Working near overhead and underground electric lines • Electricity safety codes of practice 2020 – Works • National Electricity Network Safety Code (ENA DOC 001-2019) • ENA Guidelines for Safe Vegetation Management (ENA DOC 023-2009) • ENA National Guideline for Mobile Plant Earthing (ENA DOC 031-2011) • Vegetation Risk Management for Overhead Electricity Networks – Guideline (ENA DOC 038-2018) • National Guidelines for Manual Reclosing of High Voltage Electrical Apparatus Following a Fault Operation (Manual Reclose Guidelines) (ENA DOC 042-2018) • National guidelines for safe approach distances to electrical and mechanical apparatus (ENA NENS 04-2006) • National guidelines for the selection, use and maintenance of personal protective equipment (PPE) for electrical arc hazards (ENA NENS 09-2014).	17.4.7
C127	A register of all hazardous materials will be kept updated including relevant safety data sheets for each substance. Appropriate training will be provided including methods for handling, storage and clean-up of hazardous substance and chemical spills. Applicable PPE will be provided.	17.4.7
C128	Substations will be designed in accordance with relevant Australian Standards for the prevention of fire and explosion hazards. Automatic electrical protection systems and separation distances of transformers from buildings will minimise the risk of explosion or fire.	17.4.7
C129	All personnel conducting aerial work must have the required accreditations. Specific ESWMS will be developed for each activity involving aerial work. Aerial inspection of the transmission line will be in accordance with the principles of the National guidelines for aerial surveillance of overhead electricity networks (ENA NENS 08-2006).	17.4.7

Commitment		Section of the EIS
C130	Standard policies on vehicle use and driver safety (such as speed limits, seat belt requirements, vehicle maintenance and zero drug and alcohol limits) will be implemented.	17.4.7
C131	The prevention of aircraft contact with the transmission infrastructure will incorporate: • Ongoing landholder consultation on the location of the transmission lines; • Utilisation of transmission line identification markers in areas of aircraft use, in accordance with AS 3891.1– 2008; • Recording of the transmission line on navigation mapping in conjunction with CASA, Air Services Australia and Royal Australian Air Force – Aeronautical Information Service; • Ensuring CuString personnel conducting aerial activities are accredited to do so and operate in accordance with the ESWMS and fatigue management plans under the Operational Safety Management System; • Advising other electricity entities of the location of the transmission line infrastructure; and • Encouraging private aircraft operators to conduct fixed wing aerial mustering in accordance with the techniques identified in the Aerial Mustering Code of Practice (Pastoralists and Graziers Association of Western Australia, 2003).	17.4.9
C132	CuString commits to undertaking further consultation with landholders regarding the safety of aerial work operations.	17.4.9
C133	CuString will conduct detailed Safety in Design Reviews of each major Project component. These reviews are intended to confirm that risk mitigation (safety, environment, operational) are incorporated into the Project design and to identify opportunities for improvement where potential gaps are identified.	17.4.10
C134	The use and storage of hazardous materials will be in accordance with current Australian Standards and industry codes of practice. Where available, provisions will be made to include licences and compliance with all associated conditions to ensure the level of risk is minimised.	17.4.14
C135	The Construction EMP will include a safety management sub plan, which will be generated on the basis of a Construction Risk Assessment. The risk assessment will involve a cross section of the construction workforce, in accordance with best practice risk management principles. Ongoing supervision will be provided to ensure compliance with the Safety Management Plan.	17.5.1 Vol 4 Attachment A (sub 12.02)

Commitment		Section of the EIS
C136	A Construction EMP will be prepared to address the environmental management strategies including performance criteria, management actions and monitoring, auditing and reporting requirements and to specify areas of responsibility related to the construction phase of the Project.	17.5.1 Vol 4 Attachment A (sub 20.05)
C137	A construction Quality Management Plan will ensure that the construction of the Project, including the risk mitigation factors, is delivered in accordance with the prescribed specification. It will include detailed audits and reviews at predetermined hold points in a gated approach.	17.5.1
C138	An Operational EMP will be prepared to provide specific environmental management requirements to ensure that operational activities have minimal adverse effects on the environment and surrounding community.	17.5.1
C139	An overall asset management strategy will be developed and this will be supported with management plans focusing on such aspects as condition monitoring and preventative maintenance, corrective maintenance, asset replacement and augmentation, change management, etc. Formal policies and standards will be developed based on asset life considerations and standard operating procedures will be developed to ensure that these policies and standards are delivered.	17.5.1
C140	A Bushfire Management Plan will be developed and will consider both network design and operating features relevant to fire prevention, as well as environmental procedures, such as vegetation management, to manage and mitigate the potential consequences of an ignition.	17.5.1 Vol 4 Attachment A (sub 23.12)
C141	Formal procedures will be developed to ensure that there are adequate resources to respond to community concerns such as network operations issues, traffic management, environmental issues and outline landholder communication protocols and project updates.	17.5.1
C142	CuString will maintain a state of emergency preparedness as a commitment to its workforce, local communities and other relevant stakeholders. A detailed Emergency Management Plan will be developed for the Project that details emergency response procedures should an emergency situation arise.	17.5.4
C143	Standard policies on vehicle use and driver safety (such as speed limits, seat belt requirements, vehicle maintenance and zero drug and alcohol limits) will be implemented.	17.4.7

Commitment		Section of the EIS
C144	CuString will develop a structured health and safety management system for construction and operation of the Project in accordance with AS 5577-2013 and AS/NZS 4801-2001: Occupational health and safety management systems, which includes policies, objectives and procedures for ensuring the health and safety of personnel, the community and other associated stakeholders.	17.5
C145	Training and health and safety updates will be provided to personnel and contractors where appropriate, through regular toolbox talks. Personnel trained in first aid will be present on site at all times and approximately 20 percent of the workforce will have formal first aid qualifications.	17.5
C146	The Emergency Management Plan will be developed in consultation with the relevant emergency service providers including the Department of Community Safety (which includes the Queensland Ambulance Service, Queensland Fire and Rescue Service, Rural Fire Service and Emergency Management Queensland), local government councils and other relevant community stakeholders. The Emergency Management Plan will include reference to the State Planning Policy, Mitigating the Adverse Impacts of Flood, Bushfire and Landslide and local government disaster management plans, where appropriate. Emergency service providers will be updated on amendments and revisions to the management plan, where appropriate.	17.4.9
C147	The Emergency Management Plan and emergency response procedures will be communicated to all personnel associated with the Project through inductions and toolbox talks. Copies of the Emergency Management Plan will berequired to be kept in prominent workplace locations and will be made available on site during construction.	17.4.9
C148	The Emergency Management Plan will be developed in consultation with relevant interested parties andinclude measures to manage operational responses to risks associated with hazards that have a broader impact e.g. bushfires and flashovers.	17.4.9
Chapter 18 Revised Matters of National Environmental Significance (Volume 4 EIS Supplement Attachment E)		
C149	The corridor selection will avoid environmentally sensitive areas when determining the corridor detailed design.	18.7
C150	All potential environmental impacts of the Project have been assessed and comprehensive management plans have been developed to manage potential impacts.	
C151	An adaptive management and monitoring protocol will be developed and included in the Flora and Fauna management plan to monitor the ongoing impacts during the life of the Project.	18.7

Commitment		Section of the EIS
C152	The Project will aim to mitigate potential environmental impacts through design criteria and industry standard management measures.	18.7
Chapter 19 Environmental Management		
C153a	As part of the Project various overarching management plans will be developed and implemented in relation to the broader environmental aspects for the Project • Accommodation Management Plan • Community Liaison Management Plan • Construction Methodology Management Plan • Helicopter Stringing Management Plan • Interface Management Plan • Local and Indigenous Employment, Engagement and Training Plan • Local Industry Participation Plan • Procurement and Logistics Management Plan • Sustainability Management Plan • Waste and Refuse Disposal Management Plan	19.3 Vol 4 Attachment I (additional Management Plan)
	• Biosecurity Management Plan • Community and Stakeholder engagement plan • Field development plan • Land Access Management Plan • Rehabilitation plan • Regulatory Approvals Plan • Species specific management plan • Social impact management plan	EIS Vol 3

Commitment		Section of the EIS
C153b	As part of the Construction Environmental Management Plan, various sub-plans will be developed and implemented in relation to the environmental aspects for the Project • Air Quality (Dust) Management • Biosecurity Management • Contaminated land • Cultural & European Heritage Management • Erosion and Sediment Control • Flora & Vegetation Management • Fauna Management • Hazards, Health and Safety Management Plan, including hazardous substance register • Noise and Vibration Management • Waste Management • Water Quality Management Plan, including stormwater controls and drainage measures	Vol 3 Appendix Q (Framework Environmental Management Plan)
C153c	As part of the Operational Environmental Management Plan, various sub-plans will be developed and implemented in relation to the environmental aspects for the Project • Air Quality (Dust) Management Plan • Biosecurity Management • Contaminated Land Management Plan • Erosion and Sediment Control Management Plan • Fauna Management Plan • Flora and Vegetation Management Plan • Hazards, Health and Safety Management Plan, including hazardous substance register • Noise and Vibration Management Plan • Waste Management Plan	Vol 3 Appendix Q (Framework Environmental Management Plan)

Commitment		Section of the EIS
	• Water Quality Management Plan, including stormwater controls	
C154	Key components that will be integrated into the management plans are outline of the potential impacts and the details of the specific mitigation measures including those discussed in the EIS documentation. The roles and responsibilities for who will be implementing the plan and the monitoring and reporting requirements will be included to act as a guide on site. Relevant stakeholders will be engaged as necessaryas part of the development of these plans.	19.3
C155	The components of the environmental management plan will include: • Environment and Sustainability Policy • Planning, objectives and legal obligations • Resources, roles, responsibilities and authorities • Competence, training and awareness • Communication, consultation and involvement • Documentation, document control and records • Operational controls • Emergency preparedness and response • Monitoring, inspections and audits • Incident management • Complaints management • Non-conformity, corrective action and preventative action • Environmental reporting • Management review and continuous improvement.	19.2

Commitment		Section of the EIS
C156	CuString will develop and implement an environmental management plan for construction and operation The Construction EMP and EMP (Operation) will set out a detailed procedure for managing environmental impacts during the construction and operation of the Project respectively and will be developed in accordance with the objectives, performance criteria, management measures and monitoring requirements stipulated in the Project Framework EMP. The Construction EMP and EMP (Operation) will also incorporate the approval conditions issued for the Project and any relevant commitments made by CuString in the EIS.	19.2
C157	CuString will engage with relevant state and commonwealth agencies in the development of environmental management plans	19.2
C158	CuString is committed to ensuring that: • Environmental harm and pollution is minimised through the active identification and management of environmentalrisks; • Ensuring the efficient use of resources, recycling of materials and reduction of waste; • Compliance is maintained with relevant environmental legislation, regulation and standards as well as projectapproval conditions; • An environmental management system is implemented that is developed in accordance with AS/NZS ISO 14001; and • Regular review and analysis of environmental performance is undertaken to identify and implement continual improvement	19.2
C159	CuString will ensure that the Construction Contractor's environmental record and policy aligns with CuString corporate values to achieve compliance with legislation and approved conditions.	19.2
C160	Employees and contractors will undergo site inductions and training relating to environmental management in accordance with the EMP documentation	19.2
C161	The EMP will include the development and implementation of a grievance and dispute resolution procedure to ensure any complaints from landholders and other stakeholders are managed effectively and efficiently. Where necessary, this may include monitoring or changes to environmental management plans and procedures	19.2
C162	The EMS framework will facilitate continual improvement in performance by the review and, where necessary, revision of the environmental management plans, procedures and monitoring.	19.2

Commitment		Section of the EIS
C163	Where ecological surveys have currently not been completed, ecological surveys will be completed prior to clearing to confirm the RE status and conservation significant habitat quality and condition in comparison to desktop mapping.	
Chapter 20 Cumulative impacts		
C164	The proposed mitigations are existing commitments within the EIS which are considered to be adequate to also mitigate the cumulative effects of other projects and include: • Direct impact to areas of high ecological value will be minimised through the process of corridor realignments orspanned across wherever possible using higher towers as appropriate to the ecological values and the terrainconstraints. • A Road Use Management Plan (RUMP) and a Traffic Management Plan will be developed for the Project and will include consultation with the relevant transport authorities such as DTMR, Queensland Rail and local governmentcouncils. • Prior to leaving a Project work front, or moving between Project properties, work fronts or biosecurity risk areas, all vehicles, plant, equipment and machinery shall undergo clean down. • Implementation of the waste management hierarchy to reduce the volumes of waste required to be disposed of to thelandfill.	20.4.2
Chapter 21 Environmental offsets		
C165	Where offsets are required under approval conditions an Offset Management Plan will be development in accordance with the Biodiversity Offsets Management Strategy prepared for the Project.	21.7 Vol 4 Attachment G
Volume 3		
Appendix AC Electro-magnetic field specialist study		
C166	Should apiarists consider placement of bee hives inside the easement, CuString will provide advice of suitable techniquesto shield the bee hives from the electric field generated by the transmission line.	Appendix AC

Commitment		Section of the EIS
C167	Particular mitigation measures that are to be included in the design of the transmission infrastructure include: • Voltage balancing of the transmission lines by phase transposition. • Designing the transmission network to operate remotely from a central control centre, limiting the occupationalexposure to times of repair or maintenance. • Restricting access to the substation sites by use of security fencing. This will limit the exposure of the general publicto higher fields within the substation.	Appendix AC
C168	CuString recognises that electrical and magnetic fields (EMF) is an issue of great importance to local communities and nearby residents. CuString as part of the Stakeholder and Community Engagement Plan will endeavour to: • Remain up to date with the latest scientific research into possible linkages between EMF and adverse health impacts; • Liaise closely with the community to ensure they are educated and informed of emerging research and EMF policy development; and • Encourage concerned stakeholders to liaise with independent organisations in relation to EMF and transmission infrastructure (i.e. ARPANSA).	Appendix AC

Appendix 5. Micro-siting

Micro-siting of non-linear development activities associated with:

- temporary construction activities including clearing for tower assembly and brake and winch locations, temporary site offices, workshops, temporary workers accommodation areas and temporary construction compounds,
- permanent electricity infrastructure activities requiring clearing for transmission tower pads, substations and CEV huts (including fencing and earthworks), is permitted within the project corridor and outside of the following areas:

(a) 25 m from the top of bank (main channel) of a moderate risk (amber) waterway (Fisheries Act 1994) for a transmission tower (central position);

(b) 50 m from the defined bank of a high risk (red) waterway (Fisheries Act 1994) for a transmission tower (central position); excludes where the corridor selection crosses large braided ephemeral systems / flood plains, some of which are more than 1km wide;

(c) 75 m from the defined banks of a major risk (purple) waterway (Fisheries Act) for a transmission tower (central position); excluding where the corridor selection crosses large braided ephemeral systems / flood plains, some of which are more than 1 km wide;

(d) 20 m from areas containing:

  (i) regulated vegetation within 100 m of a wetland (MSES) or

  (ii) high ecological significance wetlands (MSES)

(e) 25 m from any regulated vegetation - category B (endangered or of concern).

(f) 25 m from any regulated vegetation - category R (vegetation within 50m of a watercourse located in an applicable Great Barrier Reef Marine Park catchment)

(g) 10 m from the base of any rock outcrop/jump-up or gilgai confirmed to be habitat value for protected species.

Micro-siting of linear development activities associated with vehicle access tracks (including watercourse / waterway crossing locations) and line of sight clearing within the project corridor is permitted provided:

(a) the access track on ground disturbance has maximum 6 m width;

(b) the access at watercourse crossings is perpendicular to banks.

and outside of the following areas:

(a) regulated vegetation within 100m of a wetland (MSES)

(b) high ecological significance wetlands (MSES)

(c) regulated vegetation - category B (endangered or of concern)

(d) regulated vegetation - category R (vegetation within 50 metres of a watercourse located in an applicable Great Barrier Reef Marine Park catchment)

(e) 10m from the base of any rock outcrop/jump-up or gilgai confirmed to be habitat value for protected species.

Acronyms and abbreviations

Acronym	Definition
ACH Act	*Aboriginal Cultural Heritage Act 2003* (Qld)
ADR	accepted development requirements
AEP	annual exceedance probability
ALCAM	Australian level crossing assessment model
BIBO	bus-in bus-out
BOMS	biodiversity offset management strategy
BTF	black-throated finch
CAMBA	China–Australia Migratory Bird Agreement
CBA	cost benefit analysis
CEMP	construction environmental management plan
CEV	controlled environmental vault
CGE	computable general equilibrium
CHMP	cultural heritage management plan
CLR	contaminated land register
CuString	CuString Pty Ltd
DAF	Department of Agriculture and Fisheries
DAWE	formerly the Australian Government Department of Agriculture, Water and the Environment
DCCEEW	Australian Government Department of Climate Change, Energy, the Environment and Water
DES	Department of Environment and Science
DRDMW	Department of Regional Development, Manufacturing and Water
DSDILGP	Department of State Development, Infrastructure, Local Government and Planning
DSDSATSIP	Department of Seniors, Disability Services and Aboriginal and Torres Strait Islanders Partnerships
DTMR	Department of Transport Main Roads
EIS	environmental impact statement
EMR	environmental management register
EO Regulation	Environmental Offsets Regulation 2014
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
EPP Water and Wetland Biodiversity	Environmental Protection (Water and Wetland Biodiversity) Policy 2019
ERA	environmentally relevant activity
ESCP	erosion and sediment control plan
FDP	field development plan
FIFO	fly-in fly-out
Framework EMP	framework environmental management plan

FTE	full time equivalent
GAB	Great Artesian Basin
GDEs	groundwater dependent ecosystems
GHG	greenhouse gas
GJ	gigajoules
GTIA	Guide to traffic impact assessment
ha	hectare
HES	high ecological significance
IFS	infrastructure facility of significance
ILUA	Indigenous Land Use Agreement
JAMBA	Japan–Australia Migratory Bird Agreement
km	kilometres
kV	kilovolts
LGA	local government area
m	metre
m/s	metres per second
MCU	material change of use
MID	Ministerial infrastructure designation
MITEZ	Mount Isa Townsville Economic Zone Pty Ltd
MNES	matters of national environmental significance
MSES	matters of state environmental significance
MVA	megavolt amperes
MW	megawatts
NAIF	Northern Australia Infrastructure Fund
NC Act	*Nature Conservation Act 1992* (Qld)
NEM	National Electricity Market
Northern QREZ	Northern Queensland renewable energy zone
NWMP	North West Minerals Province
NWPS	North West Power System
OEMP	operational environmental management plan
OPGW	optical ground wire
PHA	preliminary hazard analysis
Planning Act	*Planning Act 2016*
Planning Minister	Planning Minister, Department of State Development, Infrastructure, Local Government and Planning (DSDILGP)
Planning Regulation	Planning Regulation 2017
PMST	protected matters search tool
QAS	Queensland Ambulance Service
QFES	Queensland Fire and Emergency Services
QPS	Queensland Police Service

QR	Queensland Rail
REs	regional ecosystems
RIS	regulatory impact statement
ROKAMBA	Republic of Korea– Australia Migratory Bird Agreement
RPI Act	*Regional Planning Interests Act 2014* (Qld)
RUMP	road use management plan
SARA	State Assessment Referral Agency
SCADA	supervisory control and data acquisition
SCR	state controlled road
SDAP	State Development Assessment Provisions
SDPWO	*State Development Public Works Organisation Act 1971* (Qld)
SEVT	semi-evergreen vine thickets
SIA	social impact assessment
SIMP	social impact management plan
SMPs	species management plans
SPP	State Planning Policy 2017
SRI	significant residual impacts
STP	sewage treatment plants
TAP	threat abatement plan
TEC	threatened ecological community
the Bilateral Agreement	Queensland Assessment Bilateral Agreement
TIA	traffic impact assessment
TMP	traffic management plan
TOR	terms of reference
TSS	total suspended soils
UXO	unexploded ordnance
VM Act	*Vegetation Management Act 1999* (Qld)
Waterway barrier works	works within waterways
WPA	wetland protection area

Glossary

Term	Definition
bilateral agreement	the agreement between the Australian and Queensland governments that accredits the State of Queensland's EIS process. It allows the Commonwealth Minister for the Environment to rely on specified environmental impact assessment processes of the state of Queensland in assessing actions under the Environment Protection and Biodiversity Conservation Act 1999 (Cth)
controlled action	a proposed action that is likely to have a significant impact on a matter of national environmental significance; the environment of Commonwealth land (even if taken outside Commonwealth land); or the environment anywhere in the world (if the action is undertaken by the Commonwealth). Controlled actions must be approved under the controlling provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth)
controlling provision	the matters of national environmental significance, under the Environment Protection and Biodiversity Conservation Act 1999 (Cth), that the proposed action may have a significant impact on
coordinated project	a project declared as a ' coordinated project' under section 26 of the SDPWO Act. Formerly referred to as a 'significant project'
Coordinator-General	the corporation sole constituted under section 8A of the *State Development and Public Works Organisation Act 1938* and preserved, continued in existence and constituted under section 8 of the SDPWO Act
EIS	refers to the draft EIS and revised draft EIS documents collectively. However, this term is not used when necessary to compare draft EIS and revised draft EIS information
environmentally relevant activities	an activity that has the potential to release contaminants into the environment. Environmentally relevant activities are defined in Part 3, section 18 of the *Environmental Protection Act 1994* (Qld)
imposed condition	a condition imposed by the Queensland Coordinator-General under section 54B of the SDPWO Act. The Coordinator-General may nominate an entity that is to have jurisdiction for the condition
initial advice statement	a scoping document, prepared by a proponent, that the Coordinator-General considers in declaring a coordinated project under Part 4 of the SDPWO Act. An IAS provides information about: • the proposed development • the current environment in the vicinity of the proposed project location • the anticipated effects of the proposed development on the existing environment • possible measures to mitigate adverse effects
micro-siting	means the determination of final siting and configuration of temporary construction activities and operational infrastructure (i.e. transmission towers) to reduce the development footprint and to further minimise impact on ecological values within the project corridor
matters of national environmental significance	The matters of national environmental significance protected under the Environment Protection and Biodiversity Conservation Act 1999. The eight matters are: (1) world heritage properties (2) national heritage places (3) wetlands of international importance (listed under the Ramsar Convention) (4) listed threatened species and ecological communities (5) migratory species protected under international agreements (6) Commonwealth marine areas

	(7) the Great Barrier Reef Marine Park (8) nuclear actions (including uranium mines)
properly made submission	Defined under Schedule 2 of the SDPWO Act as a submission that: (1) is made to the Coordinator-General in writing (2) is received on or before the last day of the submission period (3) is signed by each person who made the submission (4) states the name and address of each person who made the submission (5) states the grounds of the submission and the facts and circumstances relied on in support of the grounds
proponent	The entity or person who proposes a coordinated project. It includes a person who, under an agreement or other arrangement with the person who is the existing proponent of the project, later proposes the project
project area	the area on which the project components are proposed within the project corridor.
rehabilitation areas	land temporarily cleared for project construction works and not required for use during operation
study area	the area which was subject to the EIS assessment undertaken for each specific impact assessment topic (e.g. social, transport, flora and fauna)
the project	CopperString Project
the proponent	CuString Pty Ltd
works	Defined under the SDPWO Act as the whole and every part of any work, project, service, utility, undertaking or function that: (1) the Crown, the Coordinator-General or other person or body who represents the Crown, or any local body is or may be authorised under any Act to undertake, or (2) is or has been (before or after the date of commencement of this Act) undertaken by the Crown, the Coordinator-General or other person or body who represents the Crown, or any local body under any Act, or (3) is included or is proposed to be included by the Coordinator-General as works in a program of works, or that is classified by the holder of the office of Coordinator-General as works.

This page has been intentionally left blank

Office of the Coordinator-General
PO Box 15517 City East Qld 4002 Australia
tel 13 QGOV (13 74 68)

www.statedevelopment.qld.gov.au/copperstring

Queensland Government