Powerlink Queensland

July 2022

Meandu Mine Transmission Line Relocation Project

Draft Corridor Selection Report

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Powerlink Queensland

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WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

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Glossary and abbreviations

ACH Act	Aboriginal Cultural Heritage Act 2003 (Queensland)
AHD	Australian Height Datum
ASA	Additional Surface Area
CSR	Corridor Selection Report
DAF	Department of Agriculture and Fisheries (Queensland)
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth)
DES	Department of Environment and Science (Queensland)
DoR	Department of Resources (Queensland)
DSDSATSIP	*Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships*
Electricity Act	*Electricity Act 1994* (Queensland)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
EP Act	*Environmental Protection Act 1994* (Queensland)
ERA	Environmentally relevant activity
GIS	Geographical Information System
K2E ASA	King 2 East additional surface area
K2E Project	King 2 East Project
km	kilometres
kV	kilovolts
LGA	Local Government Area
ML	Mining Lease
MNES	Matters of national environmental significance
MSES	Matters of state environmental significance
NC Act	*Nature Conservation Act 1993* (Queensland)
Native Title Act	*Native Title Act 1993*
Planning Act	*Planning Act 2016* (Queensland)
Powerlink	Powerlink Queensland
PMST	Protected Matters Search Tool
SMP	Species Management Program

SPP	State Planning Policy
Stanwell	Stanwell Corporation Limited
Tarong power stations	Tarong and Tarong North power stations
TEC	Threatened Ecological Communities
TEC Coal	TEC Coal Pty Ltd, a wholly owned subsidiary of Stanwell
TMR	Department of Transport and Main Roads (Queensland)
UXO	Unexploded Ordnance
WSP	WSP Australia Pty Ltd

1 INTRODUCTION

1.1 Project background

A portion (approximately 5 kilometres (km)) of Feeder 831, the 275 kilovolt (kV) transmission line between Powerlink Queensland (Powerlink)'s Tarong and Middle Ridge substations, located to the east of Stanwell Corporation Limited (Stanwell)'s Meandu Mine, is proposed to be relocated. The affected portion of transmission line is owned and operated by Powerlink. This portion of Feeder 831 requires relocation to safely accommodate proposed mining activities at the Meandu Mine. Stanwell intends to conduct mining activities within the current surface rights area located underneath the existing line.

In addition, TEC Coal Pty Ltd (TEC Coal) (a wholly owned subsidiary of Stanwell Corporation Limited (Stanwell)) is currently seeking approval to increase the approved surface rights area at the Meandu Mine. The King 2 East (K2E) Project involves increasing the approved surface rights area (K2E ASA) within mining lease (ML) 6674 by an additional 186 hectares (ha) which will allow progression of the K2E pit to the east, over the route of Feeder 831. Planning for relocation of the portion of Feeder 831 transmission line has been undertaken with consideration of the K2E Project.

1.2 Purpose of this report

Powerlink requires a Draft Corridor Selection Report (CSR) to further progress investigations into the relocation of a portion of Feeder 831 transmission line. WSP Australia Pty Ltd (WSP) has been engaged to prepare this Draft CSR with the purpose of identifying a preferred corridor option based on the four options initially identified by Powerlink in the Meandu Mine – Feeder 831 Relocation Options Study (Powerlink, 2015) and a fifth option identified in 2017 by TEC Coal during planning for the K2E Project and which they requested Powerlink to consider in 2018.

The K2E ASA is located mainly over a portion of Yarraman State Forest (SF). Queensland Department of Environment and Science (DES) are the titleholder of State Forests in Queensland. HQPlantations has a plantation licence over this portion of the Yarraman SF with Hoop Pine and hardwood plantation operations in the area. TEC Coal has been leading discussions with HQPlantations and DES about the K2E ASA Project.

The goal of the Draft CSR is to identify a corridor within the study area, as an appropriate route for further investigation of a proposed transmission line, taking into consideration the social, environmental and physical factors identified via a desktop constraints and opportunities analysis, and early engagement with landholders and other stakeholders. A Final CSR will be issued after consultation with landholders and other stakeholders.

1.3 Methodology

The methodology used to carry out the options assessment of transmission line and associated access rights area is as follows:

- identify an study area, in which potential corridor options will be located
- undertake a desktop assessment of available site characteristics and features using the GIS database, topographic maps, satellite imagery, local government planning schemes, and government mapping and database searches on the study area
- establish the objectives of the corridor options assessment which take account of the key constraints and opportunities within the study area
- compare and evaluate the corridor options based on the social, environmental and physical constraints and opportunities identified, as well as economic considerations; and
- recommend an option based on the assessment undertaken.

1.3.1 *Early engagement with landholders and community*

Powerlink has undertaken early consultation with landholders and other stakeholders to ensure the proposed infrastructure planning meets local expectations and delivers a strong transmission network for the future.

This early engagement approach has been vital in understanding what is important to the individuals and communities that play a key role in enabling Powerlink to deliver a safe, cost-effective and reliable electricity supply.

Since December 2021, Powerlink has engaged in meetings with directly affected landholders. Powerlink has also identified adjacent landholders (not directly affected) and these landholders are being notified of the Draft CSR and being offered opportunity to submit comments to the Draft CSR. As part of the K2E-ASA project, Stanwell has consulted widely with the wider community since July 2021, including the adjacent landholders identified by Powerlink. Stanwell has appraised Powerlink that the community sentiment is generally supportive of the K2E-ASA project.

Powerlink will continue to engage with landholders and other stakeholders with opportunities to provide more feedback and submissions as the project develops.

Briefings were also provided to local councils and other government stakeholders as part of engagement activities.

Report Structure

The structure of this Draft CSR is outlined in Table 1.1.

Table 1.1 Structure of the Draft CSR

Section	Overview
1 Introduction	Describes the project background, purpose and scope of works.
2 Project description	Describes the study area and Powerlink's transmission infrastructure requirements.
3 Constraints and opportunities	Describes the social, physical and environmental characteristics within the study area.
4 Corridor assessment	Describes the factors that have influenced the identification of the given transmission line options and provides a comparison of each option.
5 Recommended option	Provides a recommendation on the most feasible corridor option based on social, environmental and physical factors, in addition to economic considerations.
6 Legislative and approval requirements	Summarises applicable Commonwealth, State and local legislation and approval requirements.
7 Conclusions	Summarises the outcomes of this Draft CSR.

2 PROJECT DESCRIPTION

The following sections are a description of the regional context, the study area for the proposed corridor options and infrastructure construction / decommissioning requirements.

2.1 Regional context

The existing Feeder 831 275kV transmission line is located immediately to the east of the existing surface rights area of the Meandu Mine and within ML6674, approximately 150km north-west of Brisbane and 14km south-west of Nanango. The nearest town to the transmission line is Yarraman located approximately 6km to the south-east from the existing transmission line. The portion of Feeder 831 to be relocated is within both the South Burnett and Toowoomba Regional Council local government areas (LGAs) (Figure 2.1).

2.2 Study area

The study area, shown in Figure 2.1 is located approximately 12km south-west of Nanango within the Toowoomba Regional Council LGA and South Burnett Regional Council LGA. The eastern extent of the study area is approximately 3km west of Yarraman. The study area comprises a number of different land tenures including State Forest, Industrial Estates, Road Reserves and freehold land.

Key features of the study area include:

- Meandu Mine (ML6674)
- Yarraman State Forest
- local Road Reserves; and
- Tarong and Tarong North power stations (Tarong power stations).

2.3 Assumptions

A five kilometre portion of the existing F381 Tarong to Middle Ridge is located to the east of the Meandu Mine and is proposed to be relocated to safely accommodate proposed mining activities at Meandu Mine. For the purpose of this Draft CSR, it is assumed that the existing five kilometre portion of 132 kV line to be relocated will be decommissioned and subsequently removed.

Stanwell intends to conduct mining activities within the current surface rights area located underneath the existing line.

The relocation of the transmission line into a new corridor will accommodate further surface rights which are the subject to an application being sought by Stanwell for (K2E ASA) within mining lease (ML) 6674.

Corridor options have been identified to balance the social, environmental and economic aspects of the transmission line relocation.

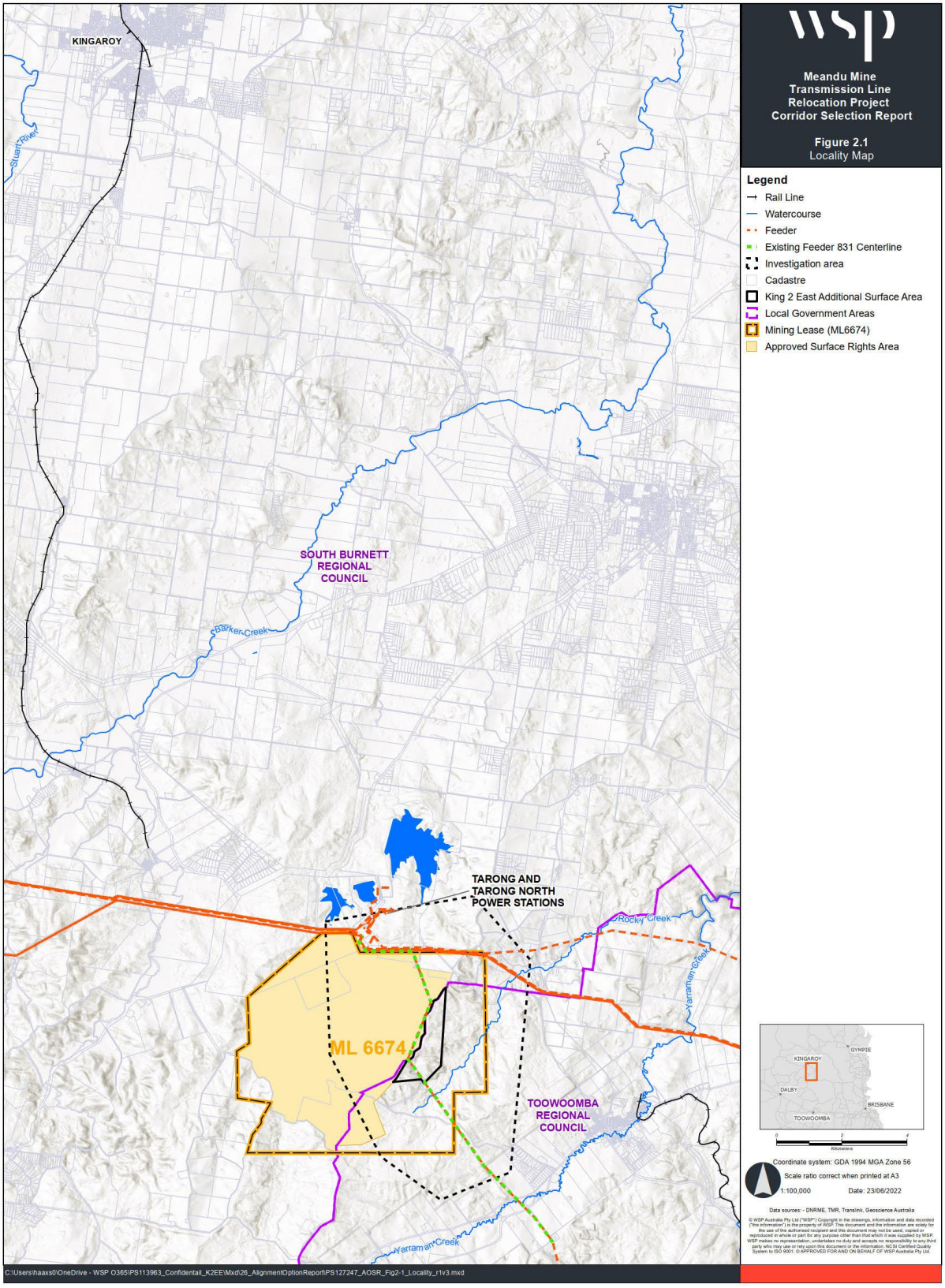

Figure 2.1 Locality map

2.4 Infrastructure requirements

2.4.1 Physical features

The transmission line easement and associated access rights area is intended to accommodate a single circuit 275kV transmission line comprising steel lattice towers. Typically, these structures will be centrally located within a 60m wide easement. Easements are usually cleared of vegetation unless an environmental or cultural heritage assessment determines the need to retain vegetation to minimise ecological or cultural impacts. These measures usually involve over the canopy stringing, vegetation scalloping and careful tower placement which can result in increased construction costs for the project.

Steel lattice towers (generally 50-70m high) keep the high voltage conductors separate from each other and clear of the ground and other obstacles. Requirements for minimum clearance between energised conductors and various types of obstacles are specified in the *Electricity Safety Regulation 2013*. The distance between structures is typically 450m on flat ground and their height is determined by the topography, land use, average temperatures, sensitive environmental areas, clearance requirements and structure loading limits.

Structures are fabricated in a range of heights to allow optimum height to be provided at each site. Typically, shorter structures are found on elevated areas such as hills, with taller structures in gullies, or where additional clearance is required over a mid-span obstacle. Various designs of self-supporting towers have been used in Queensland for over 50 years and are the standard form of support structure for high voltage construction observed through the State.

Individual components are fabricated from galvanised steel angle sections (members) and steel plate and are assembled on-site. Individual foundations support the four legs of each tower.

2.4.2 Construction requirements

Construction of a transmission line involves a series of field activities which are broadly grouped in Table 2.1.

Table 2.1 Transmission line construction field activities

Activity Group	Field activities
Clearing and access	— Site set out. — Mobilisation, including establishment of accommodation camps, laydowns and offices. — Installation of gates, grids, clean down bays and access tracks. — Vegetation clearing.
Foundations	— Tower site benching (as necessary). — Foundation installation.
Erection	— Structure assembly and erection.
Stringing	— Conductor and earth wire stringing.
Demobilisation	— Site rehabilitation. — Demobilisation.

2.4.3 Siting considerations

Siting of a transmission line is influenced by a range of issues including those outlined in Table 2.2.

Table 2.2 Transmission line siting considerations

Category	Consideration
Social factors	— Intensive land uses such as cultivation, good quality agricultural land, residential and rural residential areas. — Mining and gas production tenements and infrastructure (mining and petroleum leases, mineral development license areas, petroleum facilities, pipelines). — Separation from houses and places of assembly. — Interactions with other physical infrastructure such as roads, rail and transmission lines. — Areas of cultural and/or heritage value. — Proximity to property boundaries.
Environmental factors	— Protected flora and fauna. — Areas of high environmental value.
Physical factors	— Steep topography – limits vehicle access and increases the amount of earthworks benching at each structure site. — Geological features – rock, acid sulfate soils, erosive soils. — Number of watercourse crossings and flood risk. — Contaminated land. — Unexploded ordnance.
Economic factors	— Corridor length. — Number of bend points. — Requirements for tall structures. — Foundations affected by rock.

These factors have been taken into consideration when developing and assessing corridor options for the proposed transmission line relocation.

2.5 Decommissioning existing transmission line

The existing Feeder 831 transmission line is located immediately to the east of the approved surface rights area of Meandu Mine and within ML6674. Following relocation of the portion of Feeder 831, the existing segment of the transmission line will be decommissioned and later removed.

3 CONSTRAINTS AND OPPORTUNITIES

The following sections provide a description of the social, environmental, and physical characteristics within the study area which present potential constraints or opportunities for relocation of the transmission line.

3.1 Social environment

3.1.1 Tenure and encumbrances

Land tenure arrangements in the study area are predominantly State Forest and freehold land, with area of Lands Lease relating to the Meandu Mine and Tarong power station's operation. Other tenures include easements associated with Powerlink and Ergon Energy electrical infrastructure and local road reserves scattered throughout the study area.

The land parcels vary in size with the largest lot being the Yarraman State Forest (Lot 289 FTY1859) of approximately 3,653ha. It is noted that Powerlink prefers to cross as few operating entities as possible to minimise social impacts, and therefore the transmission line is best placed within larger lots in the study area where feasible.

Land tenure is mapped in Figure 3.1.

3.1.2 Land use

The study area crosses two LGAs, the South Burnett Regional Council LGA on the western and northern sides and the Toowoomba Regional Council LGA on the eastern and southern sides. Under the South Burnett Regional Council Planning Scheme 2017 and Toowoomba Regional Planning Scheme 2021 (v.26), most of the study area is zoned 'Rural' and 'Open Space' and within or adjoins ML6674.

Existing land uses within the study area include mining, management resource protection, production forestry, plantation forestry, utilities, and reservoir/dam (Figure 3.2). The dominant land use within the study area is mining (the Meandu Mine) and plantation forestry (Hoop Pine and some mixed hardwood plantation). Numerous forestry tracks are present throughout the study area as part of the Yarraman State Forest and existing facilities within the State Forest. The plantation forestry is interspersed with areas of native vegetation.

Small areas of mapped Strategic Cropping Land are present in the north-eastern corner and south-eastern corner of the study area. Proposed corridor options have sought to avoid this mapped Strategic Cropping Land. The southern half of the study area is located within an area designated as a Priority Agricultural Area (PAA) under the Darling Downs Regional Plan. Based on a Regional Interest Development Approval assessment undertaken for the K2E Project (WSP, 2021) it is considered that the PAA designation does not reflect current or recent land use of the land within the K2E Project area.

The study area is already traversed by the portion of the existing Feeder 831 transmission line to be relocated (along with other electrical infrastructure – Powerlink and Ergon Energy), therefore the proposed transmission corridor is not considered to be incompatible with the existing land uses.

3.1.3 Resource interests

The study area crosses a large area of the eastern side of the Meandu Mine ML6674 (refer Figure 3.1).

TEC Coal is currently seeking approval to increase the approved surface rights area at the Meandu Mine. The K2E Project involves increasing the approved surface rights area within ML6674 by an additional 186ha (K2E ASA) which will allow progression of the K2E pit to the east.

Planning for relocation of the portion of Feeder 831 transmission line has been undertaken with consideration of the K2E Project.

3.1.4 Utilities

Powerlink has four existing feeders in the study area (including Feeder 831 between the Tarong and Middle Ridge substations). The Tarong Substation is also located within the study area. In addition, Ergon Energy electrical infrastructure is located within the northern part of the study area in conjunction with Powerlink electrical infrastructure. Existing Powerlink infrastructure is mapped in Figure 3.1.

Planning for relocation of the portion of Feeder 831 transmission line has been undertaken with consideration of the existing infrastructure.

3.1.5 Transport and traffic

Some transport infrastructure exists in the study area, for example local road reserves including Ridge Road, Tarong Power Station Road, Nanango Neumgna Road, Munt Road, Reeve Road, Rocky Creek Road, and Tarong Yarraman Road.

No State-controlled roads are within the study area.

3.1.6 Housing

There are no urban areas in close proximity to the study area. There are five farm homesteads and buildings on the properties in the study area which are considered as sensitive receptors. The closest town to the study area is Yarraman, situated approximately 3km to the south-east of the eastern extent of the study area.

Dwelling locations within the study area are mapped in Figure 3.1.

3.1.7 Cultural heritage

The study area intersects the Wakka Wakka People #3 Native Title claim as well as areas not subject to a current Native Title claim, refer Figure 3.1. A search of the Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships (DSDSATSIP) cultural heritage database identifies some records of Aboriginal cultural heritage within the study area. In addition, between 2009 and 2019 Stanwell completed a number of cultural heritage surveys within Yarraman State Forest within ML6674 to the east of the existing surface rights as part of their exploration drilling program. These surveys demonstrate that Aboriginal cultural heritage has been identified from the study area (mostly isolated or scatted stone artefacts). The most significant of these scatters is located adjacent to Rocky Creek.

On-site Aboriginal cultural heritage studies would need to be undertaken on any proposed new corridor. Areas, particularly within previously undisturbed land, waterways or remnant vegetation have a reasonable likelihood of containing areas or items of cultural heritage significance.

There are no State or local listed Heritage Places listed within the study area.

3.1.8 Visual amenity

There are no urban areas, population centres, major roads or railways in close proximity to the study area so visual amenity should be a relatively minor issue. The closest town to the study area is Yarraman, situated approximately 3km to the south-east of the eastern extent of the study area. A recreational area (Rogers Day Use Area) is located approximately 500m to the south-east of the study area.

Five residences are just inside the study area. Three are in the north eastern corner ranging from 10m to 1km inside the study area boundary. Two are in the south eastern corner 60m inside the study area boundary. Therefore, these residents and visitors to the Rogers Day Use Area may be subject to visual amenity impacts depending on the proposed corridor option.

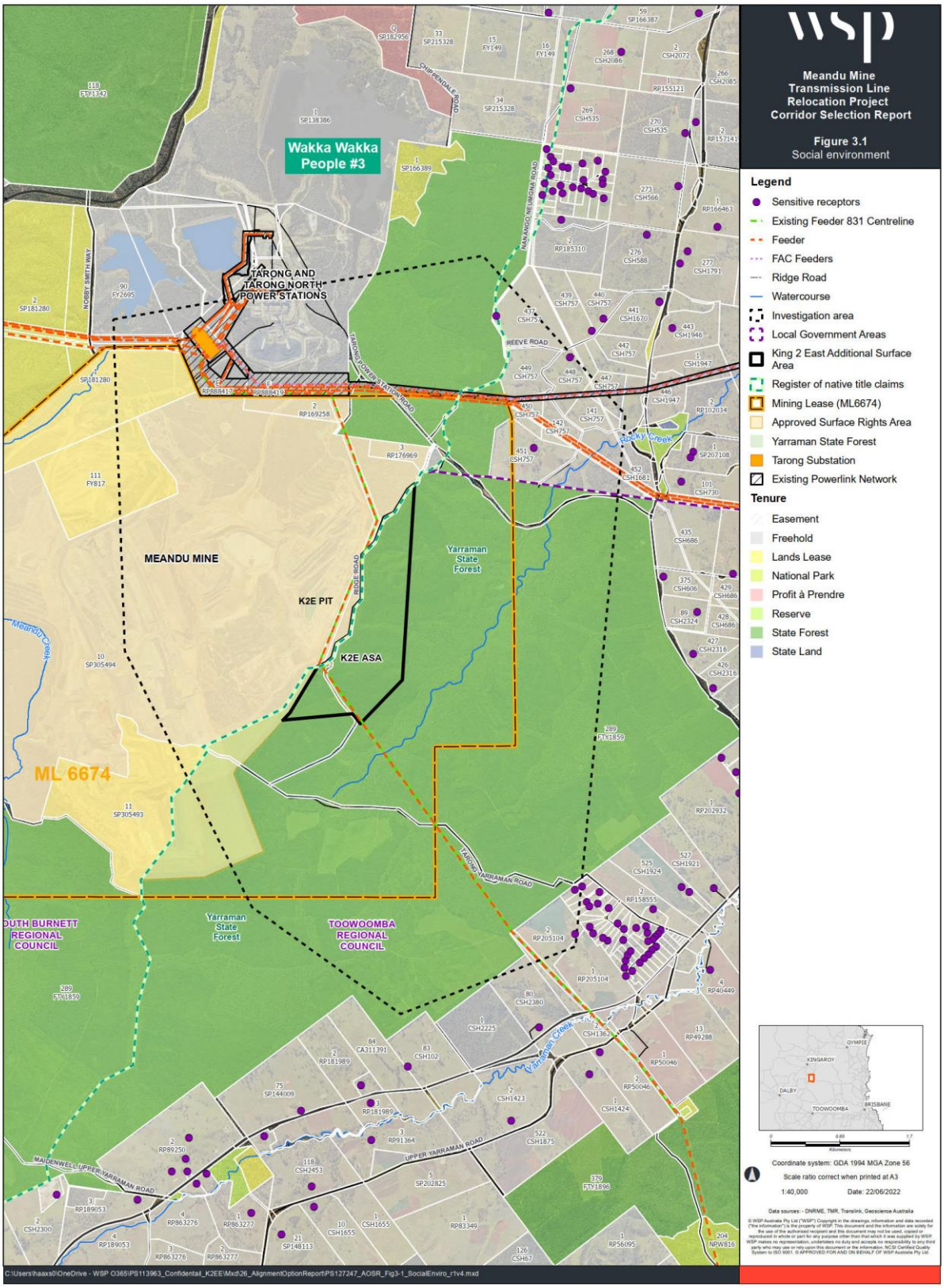

Figure 3.1 Social environment

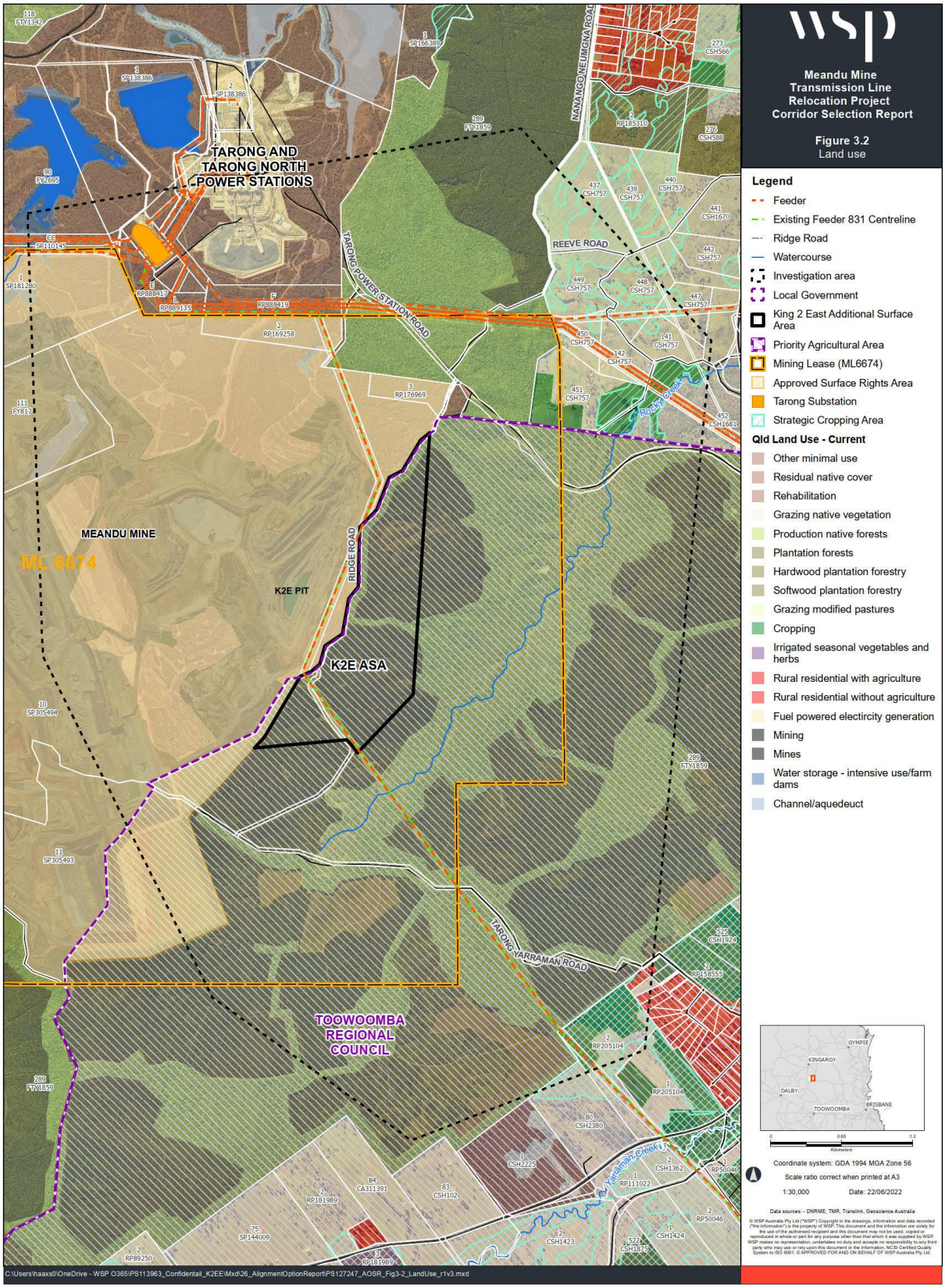

Figure 3.2 Land use

3.2 Natural environment

3.2.1 Flora

3.2.1.1 Threatened ecological communities (TECs)

Regarding matters of national environmental significance (MNES) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), the Protected Matter Search Tool (PMST) identified three listed TECs that may occur within the study area:

- Lowland Rainforest of Subtropical Australia
- Poplar Box Grassy Woodland on Alluvial Plains
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

Regional ecosystems analogous with these TECs and whether these regional ecosystems present in the study area are identified in Table 3.1.

Table 3.1 EPBC Act-listed TECs and associated regional ecosystems

THREATENED ECOLOGICAL COMMUNITIES	EPBC ACT STATUS	ANALOGOUS REs	ANALOGOUS REs PRESENT IN THE STUDY AREA
Lowland Rainforest of Subtropical Australia	Critically Endangered	REs12.3.1; 12.5.13, 12.8.3; 12.8.4; 12.11.1; 12.11.10; 12.12.1; 12.12.16	Yes – RE12.5.13 and RE 12.11.11
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	REs11.3.2; 11.3.17; 11.4.7; 11.4.12; RE12.3.10	No
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	REs11.3.23; 11.8.2a; 11.8.8; 11.9.9a RE12.8.16 REs13.3.4; 13.3.1; 13.11.3; 13.11.4; 13.11.8; 13.12.8; 13.12.9	No

TEC Coal has carried out field assessments in the K2E ASA area for regional ecosystems 12.5.13c and 12.11.11. It was found that these regional ecosystems within the K2E ASA did not meet the key diagnostic characteristics and condition thresholds of the Lowland Rainforest of Subtropical Australia Listing Advice (Threatened Species Scientific Committee, 2011). Further assessment of these regional ecosystem types within the wider study area would need to be undertaken to confirm the presence or otherwise of this TEC.

3.2.1.2 Regional ecosystems

Areas of mapped regional ecosystems contain remnant vegetation of:

- Category B area containing 'endangered'.
- Category B area containing 'of concern'.

Small areas of Category B area that is 'least concern' and Category C or R area containing 'of concern' are scattered throughout the study area.

Remnant regional ecosystems containing 'endangered' and 'of concern' vegetation is found mainly in association with the remnant vegetation areas within the Yarraman State Forest in the eastern side of the study area.

Mapped regional ecosystems within the study area are shown in Figure 3.3.

3.2.1.1 Threatened flora species

The EPBC PMST report identifies 16 listed threatened plant species that have the potential to occur within the study area. Of these, the Tall Velvet Sea-berry (*Haloragis exalata* subsp.*velutina*) is listed as Vulnerable under the EPBC Act as well as the *Nature Conservation Act 1992* (NC Act) and is known to occur along Rocky Creek, within ML6674.

3.2.1.2 Protected plants

A large portion of 'high risk' areas for protected plants is mapped as being present across the eastern side of the study area mainly in association with the Yarraman State Forest (refer Figure 3.3).

3.2.2 Fauna species and fauna habitat

3.2.2.1 Threatened fauna species

A review of the PMST report identified 25 threatened fauna species (13 bird, nine mammal, and three reptile) and 15 listed migratory species as potentially occurring within the study area.

Recent ecological field surveys undertaken to-date for the K2E Project have confirmed the presence of the following threatened species from within the Yarraman State Forest:

- Black-breasted Button-quail (*Turnix melanogaster*); and
- Greater Glider (*Petauroides volans*).

3.2.2.2 Wildlife and essential habitat

A large area of matters of state environmental significance (MSES) wildlife habitat for endangered or vulnerable species are present on the eastern side in association with the Yarraman State Forest and some are scattered throughout the study area.

Similar to the MSES wildlife habitat mapping, a large area of essential habitat (mapped under *Vegetation Management Act 1999* (VM Act)) is also present on the eastern side in association with the Yarraman State Forest.

Mapped essential habitat and MSES wildlife habitat areas within the study area are shown in Figure 3.4.

3.2.3 Protected areas

No protected areas are present within the study area.

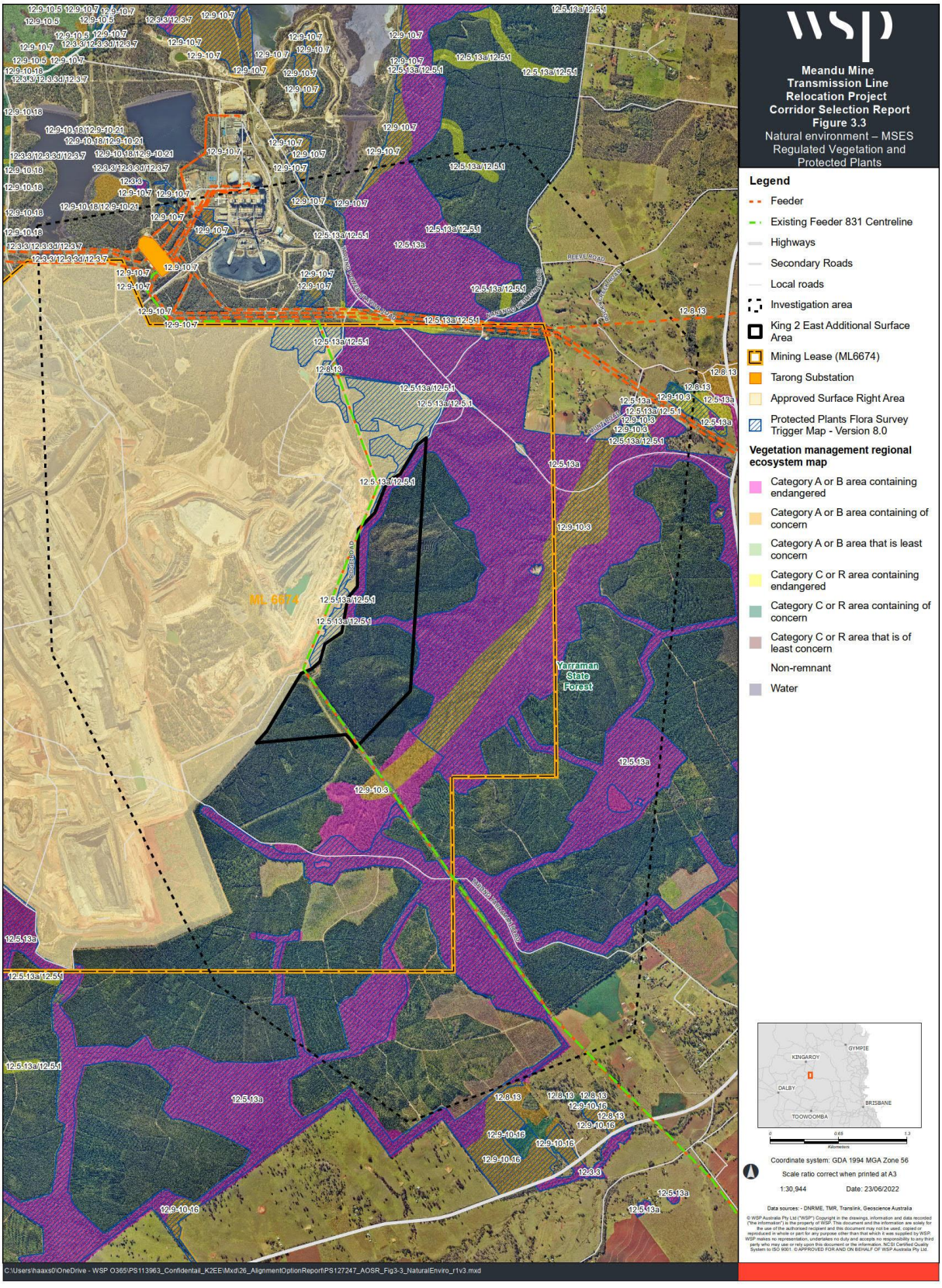

Figure 3.3 Natural environment - MSES Regulated Vegetation and Protected Plants

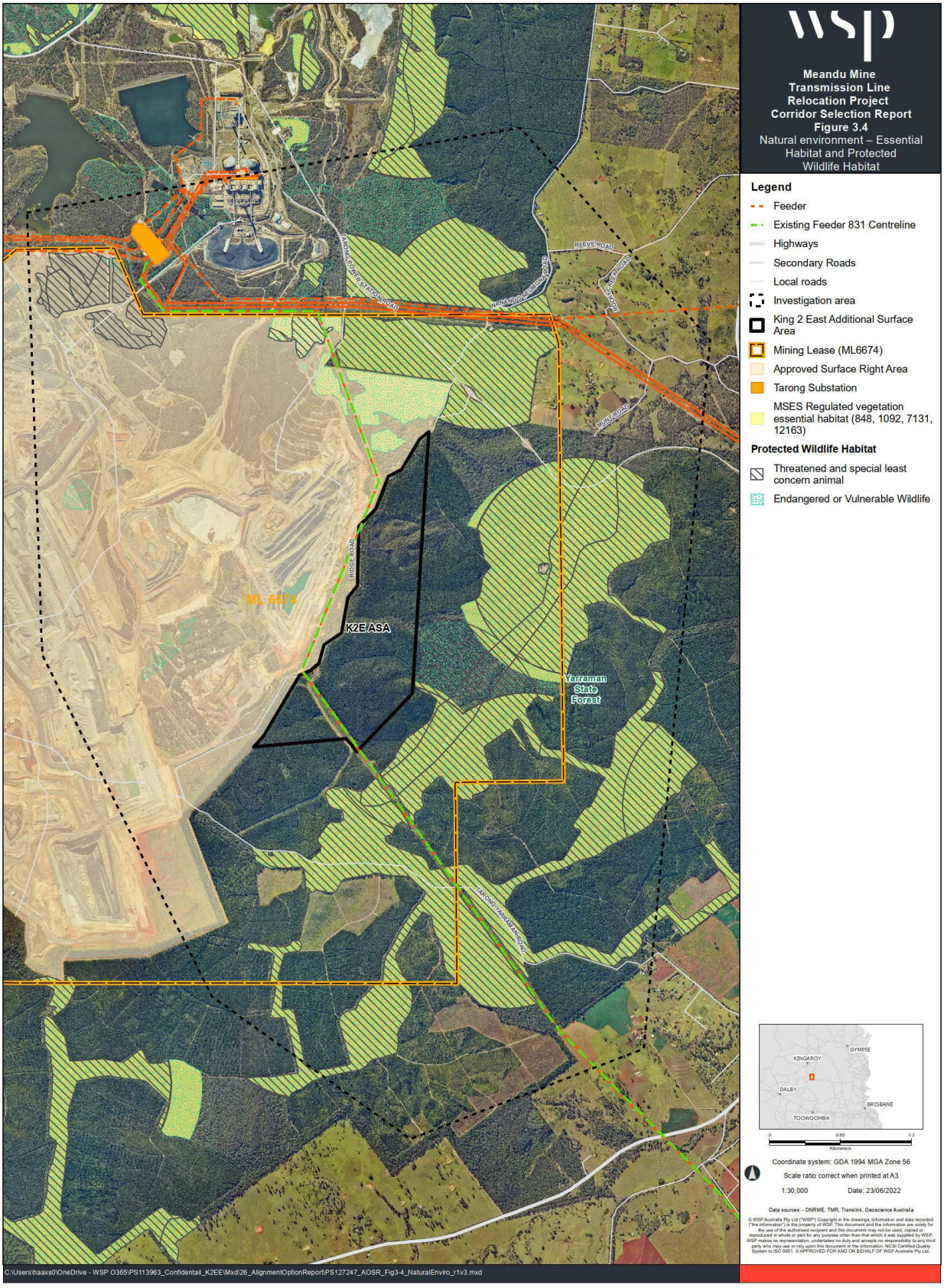

Figure 3.4 Natural environment – Essential Habitat and Protected Wildlife Habitat

3.3 Physical environment

3.3.1 Topography

The topography within the study area is heavily undulating and well drained. A north-south ridgeline along Ridge Road forms the western boundary of the K2E ASA. This ridgeline has been formed along the crest of a deeply weathered basalt ridge. The ridge is reasonably level, with upper slopes typically between five per cent and 10 per cent, mid slopes between 15 per cent and 20 per cent, and more gentle gradients at the toe of the slope towards the ephemeral drainage line known as Rocky Creek. The slopes are dissected by gullies draining to the east. Elevation throughout the study area generally ranges from 420 – 560m Australian Height Datum (AHD).

The eastern side of the study area traverses a small area which identified as High Landslide Hazard by the Toowoomba Regional Planning Scheme v. 26 (2021).

Topography is an important consideration for options assessment due to associated constructability issues. Steep slopes should be avoided where possible, as this limits vehicle access and increases the extent of earthworks at each structure site.

3.3.2 Geology

Regional geology units (1:100k) present within the study area are:

- Ro(w) (Tarong Beds(w)) – covers majority of the study area, formed in the Late Triassic, with sedimentary rock being the dominant rock type;
- Td\r>Tm (Main Range Volcanics) – presents mainly to the south and east within the study area, formed in the Tertiary, with Ferricrete being the dominant rock type.
- TQr\r-SEQ – scattered through the southern part of the study area, formed in the Late Tertiary – Quaternary, dominated by Colluvium rock type.
- Maronghi Creek beds – small areas present to the south-eastern corner and north-eastern of the study area, formed in the Quaternary, dominated by Alluvium rock type.
- Qa-QLD – a stripe presents through at the south-eastern part of the study area, formed in the Quaternary, dominated by Alluvium rock type.

Although transmission towers can be constructed on a wide range of ground conditions, geology and soil conditions can lead to constructability issues due to erosion, dispersion and acidity which may affect the structural integrity of the transmission line infrastructure. Rocky underlying soils and geological units which may cause constructability complexities. The ground conditions will need to be studied in future geotechnical investigations to establish the appropriate design strategies.

3.3.3 Soils

3.3.3.1 Soil units

The following three soil units are mapped across the study area:

- Mp4 – covers majority of the study area. Plateaux & plateau remnants of laterized basalt with undulating to rolling relief; Gradational red, no A2 horizon, acid smooth-ped whole col B horizon. Red smooth-ped earths.
- Sj5 – presents to the north and north-west of the study area. Duplex yellow-grey, hard setting A horizon, A2 horizon conspic bleached, acid pedal whole col B horizon. Hard pedal yellow duplex soils.
- Tb65 – presents to the southern boundary of the study area. Gently rolling areas of the sub-coastal low lands. Soil type is the same as Sj5 soil unit. Hard pedal mottled-yellow duplex soils.

The soil map units consist of soil order include ferrosols and sodosol in the study area. It is noted that these soils are considered to be more susceptible to erosion due to the dispersive nature of these soils. Rocky soils are associated with the steeper terrain areas.

3.3.3.2 Acid sulfate soils

Acid sulfate soils are commonly found in low-lying coastal areas where the natural ground level is less than 5m AHD. There is a low to very low probability of encountering acid sulfate soils within most of the study area as the generally topography of the area is around 420 – 560m AHD.

3.3.4 Hydrology

The study area falls within the Brisbane Basin and Burnett Basin. The study area includes the following watercourses and drainage features defined under *Water Act 2000*:

- Meandu Creek on the north-western corner
- Rocky Creek on the eastern side – note that the associated tributaries of Rocky Creek proper within ML6674 are not mapped as a watercourse and are considered drainage features (refer Figure 3.5); and
- Drainage features associated with Black Gully on the northern part.

Black Gully was previously referred to as Black Creek, which was de-gazetted as a 'Watercourse' in 2000.

Several Queensland waterways mapped for waterway barrier works defined under *Fisheries Act* 1994 are present throughout the study area ranging from low to high risks.

Mapped watercourses and Queensland waterway barrier works within the study area are shown in Figure 3.5.

The proposed corridor options are unlikely to span across the any major creeks. Most of the study area is traversed by ephemeral drainage features (unmapped watercourses shown in Figure 3.5) which are only likely to flow during periods of high rainfall and are unlikely to hold water for extended periods of time following rainfall events.

Waterway crossings could involve specific design requirements to address potential flooding and erosion risks or to mitigate damage to riparian vegetation. They may require installation of additional or taller tower structures, leading to increased costs.

3.3.5 Unexploded ordnance (UXO)

Defence UXO Mapping has identified no lands subject to potential unexploded ordnance (UXO) within the study area and therefore will not influence the selection of corridor options.

3.3.6 Bushfire risk

While most of the study area is not mapped as being a bushfire prone, certain areas within the study area are mapped as being bushfire prone including:

- vegetation along Rocky Creek - high potential bushfire intensity
- patch of remnant vegetation within the existing surface rights area of Meandu Mine – high potential bushfire intensity; and
- remnant and regrowth vegetation at the northern part of the study area around the Tarong power stations – medium potential bushfire intensity.

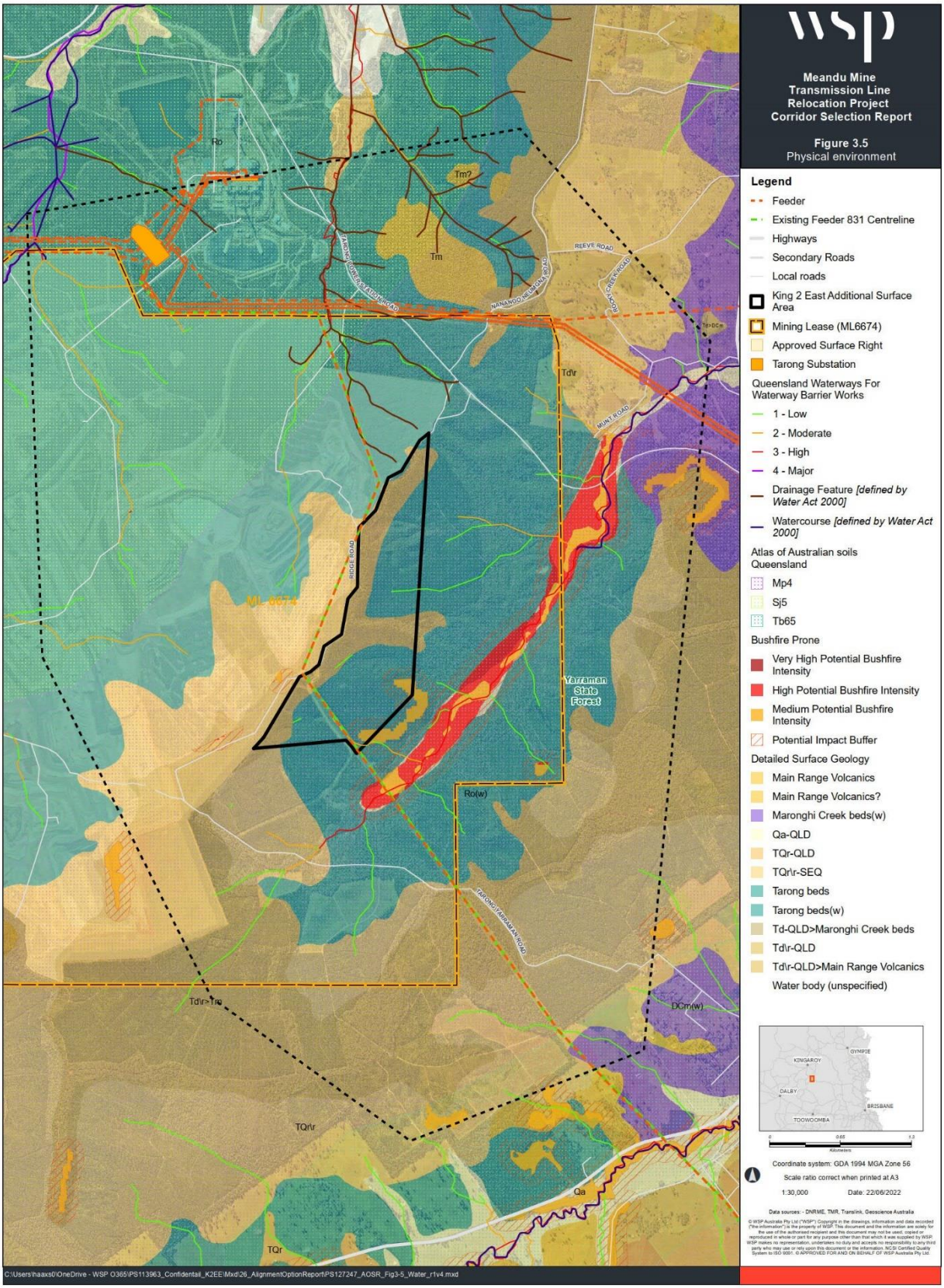

Figure 3.5 Physical environment

4 OPTION ASSESSMENT

This section provides a justification for the selection of each corridor option, as well as a detailed breakdown of the existing social, natural and physical constraints present in each option and the potential impacts upon those constraints.

4.1 Key constraints and opportunities

Social, natural and physical constraints outlined in Section 3 were taken into account in the determining proposed options. Based on the desktop analysis of the study area, the following key constraints and opportunities were considered:

- existing land use particularly to mining and plantation forestry
- potential agricultural land use
- property size and tenure type
- resource interest
- remnant vegetation and fauna habitat; and
- topography and soils.

In addition to these constraints, matters relating to economic costs associated with construction of and access to the proposed transmission line corridor were considered.

4.2 Objectives

The proposed transmission line corridor and relevant access rights area (including access tracks) should minimise the effects on factors of the social and natural environment and be best suited to the condition of the physical environment, while avoiding unreasonable and indirect routes, extreme costs and non-standard design requirements to the maximum extent possible. To achieve this, the objectives of the corridor option assessment are identified as follows:

- minimise the impact to the mining activities and proposed extension of the surface rights area of the Meandu Mine through the K2E Project
- utilise existing road and forest track network where feasible
- minimise impact on sensitive ecological areas (remnant vegetation, TECs, protected areas and State forests) and Aboriginal cultural heritage sites and areas
- minimise interaction with difficult topographical conditions
- minimise the number of watercourse and floodplain crossings, and intersect at perpendicular or near perpendicular angles where practicable
- maintain a relatively direct route and minimise the number of major bends required; and
- minimise areas of rocky soils which may pose constructability risks and dispersive soils which may be prone to erosion.

4.3 Overview of corridor options

An initial options study undertaken by Powerlink in 2015 “Meandu Mine – Feeder 831 Relocation Options Study” (Powerlink, 2015) considered and evaluated on four options for relocation of Feeder 831 transmission line (refer to Figure 4.1). A fifth option was identified in 2017 by TEC Coal during planning for the K2E Project. These options are:

- Option 1: 250m offset to the north and 900m to the east of the current Meandu Mine Surface Rights Area; or
- Option 2: through the Meandu Mine; or
- Option 3: 250m offset to the east from the K2E pit; or
- Option 4: eastern boundary of ML6674; or
- Option 5: eastern boundary of K2E ASA.

The factors considered by Powerlink in assessing these options focused on the following aspects regarding transmission line demolition and relocation:

- high level assessment of the affected network (e.g. relevant Powerlink's infrastructure and substations)
- property acquisition and development approval assessment, including land access matters
- landholder and social aspects
- engineering assessment (including Powerlink transmission line works, primary plant and related substation works, and secondary and telecommunications systems works)
- relocation risks (including land and development approvals acquisition, network operations impact, geological and topographical constraints, and resources)
- implementation time; and
- estimated cost.

The Relocation Options Overview (Table 4.1) considers the four options in the Powerlink (2015) study and the 2017 Option 5.

Table 4.1 Relocation Options Overview

Option	Pros	Cons	Outcome
Option 1: 250m offset to the north from the Meandu Mine Surface Rights Area	Second cheapest option of the four options assessed in Powerlink (2015) based on the estimated costs. Located outside of the existing surface rights area of Meandu Mine and the K2E ASA.	Remains inside ML6674. Presents some level of impact on the natural environment particularly regarding to vegetation clearing.	Further assessment required.
Option 2: through Meandu Mine	Avoids many of the environmental impacts and allows Meandu Mine to progress to the full extent of ML6674.	Considerable risks due to the corridor being through the Meandu Mine site, thereby exposing Powerlink to constraints it would normally choose to avoid (e.g. ongoing access restrictions, effects on construction, maintenance, future development and security).	Not selected for further constraint / opportunity assessment due to high potential of interference with mining activities which will impose ongoing restrictions on access, operational works, construction and maintenance. **Note:** Powerlink (2015) options study considered this a viable option.

Option	Pros	Cons	Outcome
Option 3: 250m offset to the east from the existing K2E pit	The most economical option of the four options assessed in the Powerlink (2015) options study based on the estimated costs.	Prevents extension of Meandu Mine surface rights area to the east (i.e. K2E Project). Future relocation of Feeder 831 may be required if K2E Project proceeds.	Not selected for further assessment due to the potential need to relocate the transmission line should the K2E Project proceed.
Option 4: eastern boundary of ML6674	Removes Feeder 831 from further mining impact.	Presents the highest level of impact on the natural environment as well as imposing social impacts on third parties. The most expensive option of the four options considered in the study.	Further assessment required.
Option 5: eastern boundary of K2E ASA	A relatively economical option. Located outside of the existing surface rights area of Meandu Mine and the K2E ASA.	Similar to Option 1: remains inside ML6674; presents some level of impact on the natural environment particularly regarding to vegetation clearing.	Further assessment required.

All of the proposed options increased the length of the existing Feeder 831, causing marginal increases in Powerlink's ongoing maintenance costs. Each option will impact upon the natural environment to some degree.

On the balance of the information assessed it was considered that Options 1, 4 and 5 were viable solutions to safely accommodate proposed mining activities at the Meandu Mine. Option 2 and Option 3 would either interfere with the current mining activities or prevent TEC Coal from extending the surface rights area of the Meandu Mine or require further relocation should the K2E Project proceed and therefore have therefore not been considered for further assessment.

4.4 Options assessment and comparison

The corridor option assessment against each of the relevant constraints / opportunities is summarised in Table 4.2 and illustrated in Figure 4.1. The following constraints are either not present within the study area or not traversed by the proposed corridor options:

- State-controlled roads
- State or local listed Heritage Places
- protected areas (nature refuge or estates)
- railway corridors
- utilities.

As such, they are not applicable to the options assessment and are not discussed further. Visual amenity is assessed via the proximity of houses to the proposed corridor options.

Table 4.2 Summary of options assessment

Constraint / Opportunity	Option 1 - 250m offset to the north from the Meandu Mine Surface Rights Area	Option 4 – eastern boundary of ML6674	Option 5 – eastern boundary of K2E ASA
Social Environment			
Tenure and encumbrances	— Land parcels impacted (no.) (excluding Powerlink owned land): **3** — Includes freehold, State land and local road reserve	— Land parcels impacted (no.) (excluding Powerlink owned land): **4** — Same tenure types to Option 1	— Land parcels impacted (no.) (excluding Powerlink owned land): **3** — Same tenure types to the other two options
Land use	— Strategic Cropping Area intersected (ha): **0 ha** — Priority Agricultural Area (PAA) intersected: **3.9km located within the PAA**	— Strategic Cropping Area intersected (ha): **0 ha** — Priority Agricultural Area (PAA) intersected: **6km located within the PAA**	— Strategic Cropping Area intersected (ha): **0 ha** — Priority Agricultural Area (PAA) intersected: **3.4km located within the PAA**
Resource interests*	— Wholly located within ML6674	— Small sections intersected with the eastern boundary of ML6674	— Wholly located within ML6674
Housing	— Nil within 500m or 1km	— 1 house (on Munt Road) located within 500m and 6 properties located within or close to 1km of the corridor	— Nil within 500m or 1km
Transport and traffic*	— Local road crossings (no.): **2 crossings of 1 local road**	— Local road crossings (no.): **4**	— Local road crossings (no.): **1**
Cultural and heritage	— Native Title claim area intersected (Wakka Wakka People #3): **approximately 1.4km located within the Native Title area.**	— Native Title claim area intersected (Wakka Wakka People #3): **approximately 1.4km located within the Native Title area.**	— Native Title claim area intersected (Wakka Wakka People #3): **approximately 1.3km located within the Native Title area.**
Natural Environment			
Flora*	— Category B (remnant) vegetation intersected: **approximately 3.9km located within the Category B area contains endangered or of concern vegetation.** — Category C (high value regrowth) vegetation intersected: **Nil** — Protected plants trigger area intersected: **approximately 2.9km located within the protected plants area.**	— Category B (remnant) vegetation intersected: **approximately 5km located within the Category B area contains endangered or of concern vegetation**. — Category C (high value regrowth) vegetation intersected: **Nil** — Protected plants trigger area intersected: approximately **5km located within the protected plants area.**	— Category B (remnant) vegetation intersected: **approximately 0.9km located within the Category B area contains endangered or of concern vegetation**. — Category C (high value regrowth) vegetation intersected: **approximately 1.2km located within the Category C area contains high value regrowth vegetation.** — Protected plants trigger area intersected: **approximately 2.1km located within the protected plants area.**
Fauna Habitat*	— MSES wildlife habitat for endangered or vulnerable species: **approximately 3km located within the mapped area.** — Essential habitat: **approximately 3km located within the essential habitat map area.**	— MSES wildlife habitat for endangered or vulnerable species: **approximately 1.7km located within the mapped area.** — Essential habitat: **approximately 5km located within the essential habitat map area.**	— MSES wildlife habitat for endangered or vulnerable species: **approximately 4.7km located within the mapped area.** — Essential habitat: **approximately 1.5km located within the essential habitat map area.**
Physical Environment			
Topography	— Elevation range: from 472m to 588m — Average slope: 6.1% — Maximum slope: 22%	— Elevation range: from 456m to 506m — Average slope: 5.7% — Maximum slope: 18.7% — This option traverses relatively less variable terrain with less steep slopes compared to the other options.	— The topography that this option traverses is similar to Option 1.
Geology and soil	— Located wholly within Tarong beds(w) — Located mostly within ferrosol soil	— Traverses Tarong beds(w), Td\r-QLD Main Range — Volcanics, TQr\r-SEQ and Qa-QLD — Located mostly within ferrosol soil	— Surface geology is similar to Option 1 — Located mostly within ferrosol soil
Hydrology*	— Waterway crossings (no.): — **3 crossings of Black Gully** (drainage feature defined by *Water Act 2000*)**	— Waterway crossings (no.): — **1 crossing of Black Gully** — **Potential interaction with Rocky Creek**	— Waterway crossings (no.): — **1 crossing of Black Gully**
Mapped bushfire prone areas*	— Approximately **1.5km** of the corridor traverses High Potential Bushfire Intensity, Medium Bushfire Intensity and Potential Impact Buffer areas.	— Approximately **1.7km** of the corridor traverses High Potential Bushfire Intensity, Medium Bushfire Intensity and Potential Impact Buffer areas.	— Approximately **1km** of the corridor traverses a Medium Potential Bushfire Intensity area and Potential Impact Buffer area.

Constraint / Opportunity	Option 1 - 250m offset to the north from the Meandu Mine Surface Rights Area	Option 4 – eastern boundary of ML6674	Option 5 – eastern boundary of K2E ASA
Other relevant factors			
Length of corridor*	— Approximately 5km	— Approximately 8.6km	— Approximately 4.5km
Potential Bend Points (no.)*	— 4	— 1	— 3
Crossovers of transmission line infrastructure	— Nil	— Nil	— Nil
Economic (cost) considerations	— Cost of option is second economical of 2015 options	— Likely to be the most expensive option due to the length of the line	— Cost of option is likely to be similar to Option 1

* Identified as project-specific key constraints for the corridor option selection (refer to Figure 4.1)

**Note: Black Gully was previously referred to as Black Creek, which was degazetted as a 'Watercourse' in 2000

Green shading identifies preferred option while grey shading denotes that there is nothing to distinguish between options.

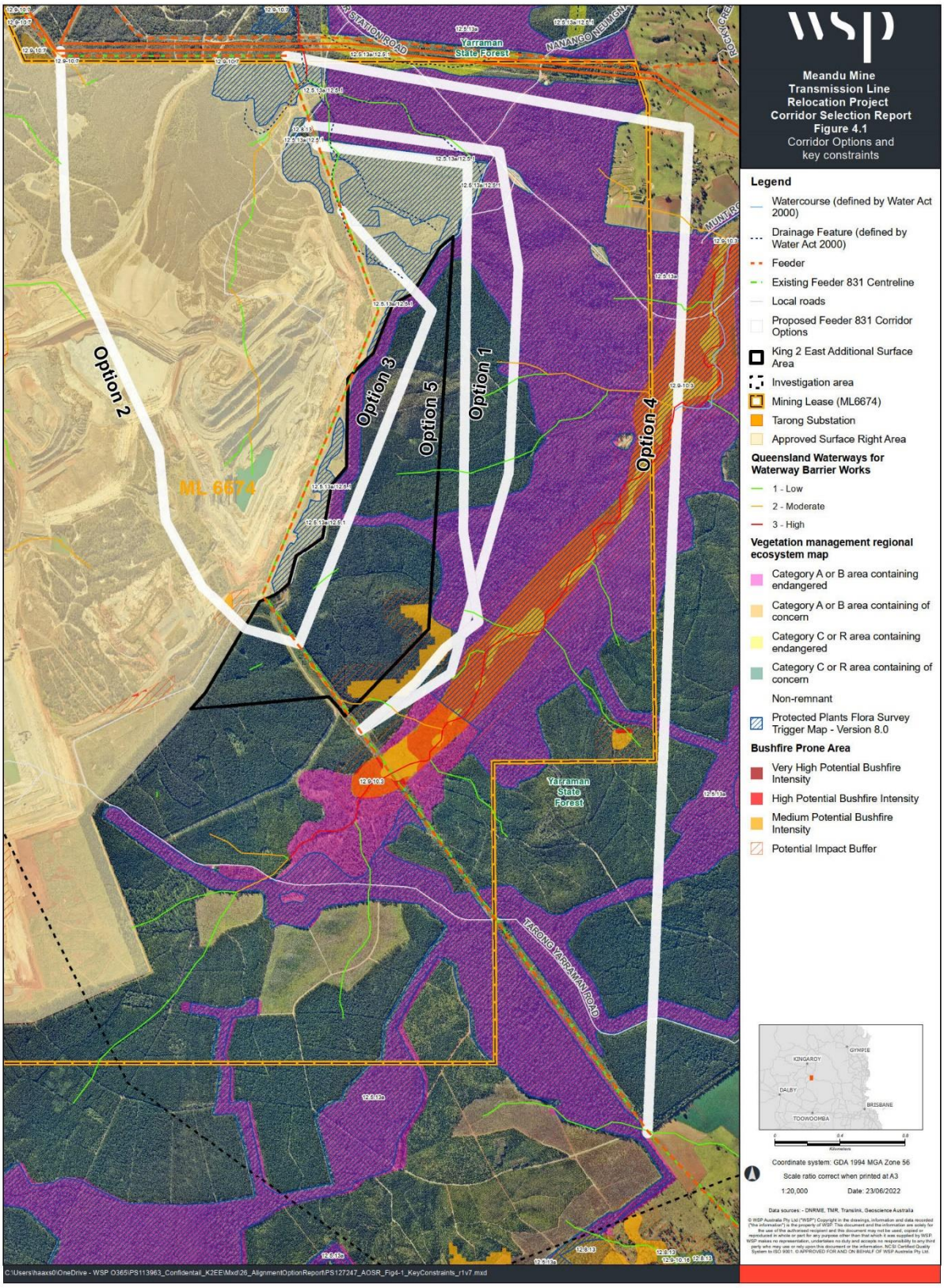

Figure 4.1 Corridor Options and key constraints

5 RECOMMENDED OPTION

The outcomes of the options assessment against the constraint / opportunity criteria listed in Table 4.2 are:

- Option 4 corridor has the longest distance and imposes the most impact to the social and natural environment and is therefore not recommended.
- Option 1 and the Option 5 have very similar impact to the social and natural environment.
- Both Option 1 and Option 5 will avoid the potential impacts to and from mining activities by the Meandu Mine including the K2E Project.
- Option 5 is recommended over Option 1 due to:
  - the corridor is relatively shorter and with fewer bend points;
  - the corridor has relatively less extent of impacts to protected flora, fauna habits and potentially watercourses.

5.1 Easement requirements

Easement requirements will be addressed in consultation with landholders and other stakeholders as part of determining a final alignment in a later phase of the project.

Development of the current recommended corridor option for the new line would require new easements to replace the existing portion of Feeder 831 easements, in order to accommodate the new 275kV transmission line. This would ensure the new transmission line can be guaranteed with sufficient access rights area to undertake future maintenance and operational works, after the existing line is decommissioned and removed, in order to avoid additional conflicts with nearby mining activities.

6 LEGISLATIVE AND APPROVAL REQUIREMENTS

A range of planning and environmental approvals may be required at the Commonwealth, State and local level for the development of the proposed transmission line. Applicable electrical, planning and environmental legislation and associated approvals or permits likely to be required are discussed in this section.

6.1 Commonwealth legislation

6.1.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Commonwealth's key legislative framework for protecting and managing important environmental values including flora, fauna, ecological communities and heritage places. These values are defined as Matters of National Environmental Significance (MNES) under the EPBC Act. The EPBC Act is administered by the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) and establishes a process for environmental assessment and approval of proposed actions that have, will have or are likely to have a significant impact on MNES. If the proposed works may cause a significant impact on an MNES, the selected corridor must be referred to the Commonwealth Minister for Environment for assessment of the potential impacts. The Minister will decide whether the project is:

- not a controlled action (the selected corridor does not need to be assessed any further)
- not a controlled action 'particular manner' (the selected corridor does not need to be assessed any further, providing that the action is undertaken in accordance with conditions that are supplied with the decision)
- controlled action (the selected corridor will need to be assessed against the EPBC Act, through one of several mechanisms available depending on the type of the proposed works).

Powerlink will need to undertake ecological field surveys and subsequent significant impact assessments to understand the presence of and potential impacts to MNES threatened species and habitats. The findings of the ecological surveys and significant impacts assessments to MNES will determine the requirement for referral to DCCEEW.

6.1.2 Native Title Act 1993

The *Native Title Act 1993* (Native Title Act) provides for the recognition and protection of traditional rights and interests in land and waters held by the Aboriginal and Torres Strait Islander people under their traditional laws and customs. Native title rights are determined under the common law of Australia. Any acts or dealings in relation to land and waters subject to native title are only valid if they comply with the provisions of the Native Title Act.

The study area intersects the the Wakka Wakka People #3 (QC2016/003). The rest of the proposed alignment is not within areas of existing Native Title claims. This claim is not relevant within land over which Native Title has been expressly extinguished including freehold tenure, land dedicated as road reserve on or before 23 December 1996 and specific State lease land.

Within land over which Native Title rights do exist, Powerlink must comply with the requirements of the Native Title Act to secure an easement for the transmission line. Construction of Powerlink's electricity transmission lines is covered by the process under section 24KA of the Native Title Act, which validates future acts that consist of the construction and operation of public infrastructure and suspend the native rights over the land for the duration of the easement. Therefore, the legislative requirements under the Native Title Act are a low risk to the corridor options.

6.2 State legislation

6.2.1 Electricity Act 1994

The *Electricity Act 1994* (Electricity Act) is the principal legislation governing Queensland's electricity industry. It provides a framework for all electricity industry participants to follow to ensure the efficient, economically and environmentally sound supply and use of electricity. Powerlink must comply with the conditions set for transmission authorities under section 31 of the Electricity Act. Specifically, it states that the transmission entity must properly account for the environmental effects of its activities under the transmission authority.

Requirements for construction and operation of the electricity network are set out under the Electricity Act and subordinate legislation including the *Electricity Regulation 2006*. A number of activities related to the construction and operation of electricity infrastructure are exempt from approval. In particular, the clearing of native vegetation on freehold land is exempt development if the clearing is for operating works for a transmission entity on land subject of a designation for operating works under the *Planning Act 2016*.

The legislative requirements of the Electricity Act are standard to Powerlink projects and therefore pose a low risk to the construction of the transmission line.

6.2.2 Electricity Safety Act 2002

The *Electricity Safety Act 2002* (Electricity Safety Act) seeks to prevent the potential death, injury or destruction caused by electricity. The Electricity Safety Act regulates electricity works in order to prevent persons from being killed or injured by electricity, and to prevent property from being destroyed by electricity. The transmission line must be designed in compliance with the requirements outlined under the Electricity Safety Act. These requirements are standard to Powerlink processes and therefore have a low risk over the corridor options.

6.2.3 Planning Act 2016

The *Planning Act 2016* (Planning Act) enables the Planning Minister to designate premises for the development of infrastructure prescribed within the *Planning Regulation 2017*. 'Electricity operating works' are considered 'infrastructure' which is prescribed development under the *Planning Regulation 2017*. The Planning Minister is the only State minister with authority to designate land for infrastructure. The MGR outlines the process for making ministerial designations. The assessment process involves submission of an environmental assessment report, a minimum 15-day consultation period and a State interest review.

A designation includes requirements about works for the infrastructure (such as the height, shape, bulk, landscaping, or location of works), the use of premises including access and ancillary uses, or lessening the impact of the works or use (such as environmental management procedures). Under section 44 of the Planning Act, infrastructure that is designated is considered accepted development and will not require further approvals under the Planning Act (with the exception of building work under the *Building Act 1975*). However, this does not exempt any approvals required under other legislation.

A new Infrastructure Designation proposal would be required for construction of the transmission line.

6.2.4 Land Act 1994

The *Land Act 1994* (Land Act) governs the allocation and management of land for development including non-freehold, freehold, leasehold and other tenures. The transmission corridor options traverse a mix of freehold tenure, State land and local road reserves. The *Electricity Act 1994* provides some exemptions to the Land Act for works by transmission entities such as Powerlink. Transmission entities are entitled to take necessary action in publicly controlled places (such as unallocated State land) to provide or supply electricity under section 101 of the Electricity Act, as well as undertake works on road reserves through written agreement from the road authority under section 102.

6.2.5 Acquisition of Land Act 1967

The *Acquisition of Land Act 1967* (Acquisition of Land Act) sets out the processes for compulsory and voluntary acquisition of land for a public purpose by a constructing authority. Powerlink may acquire freehold land or register an easement over land for the transmission line. Land may be acquired either by voluntary agreement for easements or other tenures required or, where agreement cannot be reached, by compulsory resumption of land.

6.2.6 Environmental Protection Act 1994

The *Environmental Protection Act 1994* (EP Act) is administered by the Department of Environment and Science (DES) and operates as the key legislative framework for environment protection and management in Queensland through a number of mechanisms to monitor and enforce environmental compliance. Section 319 establishes a general environmental duty of care which Powerlink are obliged to meet when undertaking works and operations of their electrical infrastructure. The duty states that an organisation undertaking an activity must not cause, or be likely to cause, environmental harm unless all reasonable and practicable measures to prevent or minimise the harm are taken.

Powerlink may exercise this duty of care through the development of preliminary studies, subsequent environmental assessment reports and project-specific environmental management plans implemented throughout the construction and operational stages of the project.

The *Environmental Protection Regulation 2008* is subordinate to the EP Act and identifies a number of 'Environmentally Relevant Activities' (ERAs) which have the potential to release contaminates into the environment or cause environmental harm. It is not expected that the development of the transmission line would trigger an ERA requiring an Environmental Authority.

6.2.7 Nature Conservation Act 1992

The *Nature Conservation Act 1992* (NC Act) is the primary legislation governing the protection and management of native wildlife, habitat and protected areas, including national parks and nature refuges. The NC Act is administered by the DES. Where clearing is required in an area containing threatened flora species and supporting habitats, a clearing permit must be obtained from the DES. The protected plants flora survey trigger map identifies 'high risk' areas for protected plants to occur and must be used to determine whether a targeted flora survey is required for a particular area. 'High risk' areas are those in which threatened flora is known or likely to exist.

All three corridors contain traverse high risk areas. If clearing is to occur within a high risk area, a targeted flora survey will need to be undertaken in accordance with DES's *Flora Survey Guidelines - Protected Plants* to determine whether protected plants are present. This survey must then be submitted to the DES along with a request to obtain an approval or exemption notice (where no threatened flora is present).

Although mapping indicates the potential for threatened species to be present in the study area, it is unknown whether threatened flora would be impacted by clearing within the corridor until field surveys are conducted. If threatened flora is present and a permit is granted, an offset condition may be required for the clearing activity to counterbalance any impacts and ensure the viability of the protected species affected. Offsets conditioned under a clearing permit are to be in accordance with the *Environmental Offsets Act 2014.*

As with any removal of native vegetation and habitats, there also is inherent risk of impacting animal breeding places of least concern (non-colonial) fauna species. To mitigate this risk, it is a requirement under the NC Act to implement a Species Management Program (SMP) "low risk of impacts". If an animal breeding place for an endangered, vulnerable, near threatened, special least concern or least concern (colonial breeder) fauna species is recorded in areas of potential impact, Powerlink will require a SMP "high risk of impacts" prior to undertaking any construction activities.

6.2.8 Vegetation Management Act 1999

The Department of Resources (DoR) administers the *Vegetation Management Act 1999* (VM Act) which seeks to manage native vegetation in Queensland, with the exception of non-woody vegetation regulated under the NC Act. Regulated

Vegetation Mapping identifies categorised areas of remnant vegetation in Queensland and is used to establish whether clearing of native vegetation is considered assessable development requiring a permit.

The corridor options traverse areas of native vegetation that may need to be cleared. Under schedule 10 of the *Planning Regulation 2017*, operational work that is the clearing of native vegetation is assessable development unless the clearing is exempt clearing work or accepted development. However, under section 44 of the Planning Act, where a Infrastructure Designation is granted, the work would automatically be considered accepted development. As highlighted in section 6.2.1, a similar exemption is also provided under section 112A of the Electricity Act.

6.2.9 Water Act 2000

The *Water Act 2000* (Water Act) provides the legislative framework for the sustainable use, allocation and management of water resources in Queensland. It is administered by DoR and regulates activities occurring within designated watercourses under the Water Act. The Watercourse Identification Map categorises water features as either a designated watercourse, drainage feature, downstream limit of a watercourse or lake, and is used to determine the assessment requirements for undertaking activities within a watercourse. Activities including excavating, filling or destroying native vegetation within a watercourse may require approval under the Water Act in the form of a riverine protection permit. Powerlink is an approved entity exempt from requiring a permit if the self-assessment guidelines under DoR's 'Riverine protection permit exemption requirements' are followed.

The corridor options traverse several drainage features. While construction of the transmission line will not require works disturbing a waterway, construction of new maintenance tracks over designated watercourses will need to comply with the exemption requirements. Compliance with the exemption requirements may be achieved through the implementation of a Construction Environmental Management Plan (CEMP). Where compliance cannot be met, a riverine protection permit would be required from DoR for any works within affected watercourses.

6.2.10 Fisheries Act 1994

The *Fisheries Act 1994* (Fisheries Act) governs the management of fisheries, declared fish habitat areas and marine plants and is administered by the Department of Agriculture and Fisheries (DAF). Works which may cause disturbance to 'waterways' as defined under the Fisheries Act can be subject to assessable operational work for waterway barrier works, unless construction complies with the conditions under the 'Accepted development requirements for operational work that is constructing or raising waterway barrier works'.

The Development Assessment Mapping System is used to determine the presence of waterways in an area and their risk level. The corridor options cross a number of waterways of various risk levels. Construction of the transmission line will not require works disturbing a waterway; however, construction of maintenance tracks across waterways will need to comply with the Accepted development requirements. It is not likely that Powerlink would require approval for the works as long as new waterway crossings are built in accordance with the requirements. Should any works within a waterway not comply with the Accepted development requirements, a development permit is ordinarily required under the Planning Act. However, assuming an Infrastructure Designation is granted over the project, operational work for waterway barrier works will automatically be considered accepted development not requiring a development permit.

6.2.11 Aboriginal Cultural Heritage Act 2003

The *Aboriginal Cultural Heritage Act 2003* (ACH Act) seeks to provide effective recognition, protection and conservation of Aboriginal cultural heritage. It establishes the processes for managing activities that may cause potential harm to Aboriginal cultural heritage, which can be but not exclusively identified through the Aboriginal Cultural Heritage Database and Register and administered by Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships (DSDSATSIP).

A search of the DSDSATSIP database has identified a number of records of Aboriginal cultural heritage values within the study area. Powerlink will be responsible for carrying out works in accordance with the Duty of Care Guidelines under the ACH Act by taking all reasonable and practicable measures to ensure the activities do not harm Aboriginal cultural heritage values. The Guidelines categorise activities depending on the nature of the works and likelihood of

causing harm. These guidelines identify reasonable and practicable measures for ensuring that activities are managed to avoid or minimise harm to Aboriginal cultural heritage.

Should the project be considered to pose a high risk to Aboriginal cultural heritage, engagement with the relevant cultural heritage parties for the area is likely to be required. It also may necessitate preparation of a cultural heritage management plan or cultural heritage management agreement. Activities which pose a high risk to Aboriginal cultural heritage which may apply to the project include:

- works in proximity to registered Aboriginal cultural heritage sites or places, or within places with known cultural heritage values
- works within areas with little or no previous ground disturbance (i.e. clearing of remnant vegetation, escarpments)
- works in proximity to water features, such as riparian areas.

6.2.12 *Transport Infrastructure Act 1994*

The *Transport Infrastructure Act 1994* (Transport Infrastructure Act) regulates the management of the State-controlled road network and is administered by the Department of Transport and Main Roads (TMR). The corridor options do not traverse any State-controlled roads. Under section 50 of the Transport Infrastructure Act, construction, maintenance and operation of ancillary works and encroachments within State-controlled roads (i.e. placement of a transmission line over the road) can only be undertaken where a written approval has been granted from TMR.

6.2.13 *State Planning Policy*

The State Planning Policy (2017) (SPP) sets out the framework of 17 State Interests that are relevant to the assessment of development in Queensland. The SPP applies, to the extent relevant, to development applications and designated infrastructure under the Planning Act and prevails over all other regional and local planning instruments. The relevant state interests are outlined in Table 6.1 along with a description of how each interest relates to the project.

Table 6.1 Summary of applicable SPP State Interests

Relevant State Interest	Application	Relevant State Interest
Economic Growth	Agriculture	The study area traverses a small portion of Class A and B agricultural land (crop land). The mapped Class A and B agricultural land is within the approved surface rights area of the Meandu Mine; therefore, the area is not used for agricultural purposes.
	Mining and Extractive Resources	Apart from the existing Meandu Mine to the west of the corridor options, the study area is not located near any Key Resource Area (KRA). The study area is therefore not expected to impact on mining and extractive resources. The corridor options for the relocation have taken into consideration proposed activities of the Meandu Mine
Environment and Heritage	Biodiversity	The study area is mapped as containing the following biodiversity related MSES: — Remnant RE 12.5.13c (Category B) — High value regrowth RE 12.5.13c (Category C) — Regulated vegetation intersecting a watercourse — Threatened fauna species including the Black-breasted Button-quail (vulnerable) Spotted-tail Quoll (vulnerable);

Relevant State Interest	Application	Relevant State Interest
		Powerful Owl (vulnerable); Oriental Cuckoo (special least concern); Black-faced Monarch (special least concern); Spectacled Monarch (special least concern); Rufous Fantail (special least concern) — Threatened flora species including: *Callitris baileyi, Cossinia australiana, Dichanthium setosum, Haloragis exalata subsp. velutina, Paspalidium grandispiculatum, Picris conyzoides, Rhaponticum australe, Sarcochilus weinthalii, Thesium australe*
	Cultural Heritage	Multiple records of Aboriginal cultural heritage values have been identified within the study area. The ACH Act requires all people carrying out activities to take all reasonable and practicable measures to protect Aboriginal cultural heritage (Section 23). Powerlink intends to meet its duty of care under the ACH Act through formal a Cultural Heritage Management Agreement to be negotiated with the relevant Aboriginal Party. This agreement will include processes for detailed Cultural Heritage assessments and surveys with Traditional Owners.
	Water Quality	The study area transects a number of unmapped watercourses and one drainage feature and as such will be designed to avoid and minimise impacts to these watercourses where possible. An EMP will be prepared and ensure any impacts to water quality during construction are minimised.
Safety and Resilience to Hazards	Emissions and Hazardous Activities	The Environmental Assessment Report (EAR) will assess potential hazardous activities and risks to people and property that may be associated with the selected corridor. Where potential emissions and hazardous activities are identified during construction, appropriate mitigation measures will be implemented to avoid, mitigate and minimise any adverse impacts.
	Natural Hazards, Risk and Resilience	The study area is mapped as being in proximity to a bushfire prone area. The bushfire risk may increase during construction; however it is not anticipated that the risk to people, and property will increase as a result of the operation of the transmission line.
Infrastructure	Energy and Water Supply	The relocation of transmission line will allow for continuation of the reliable provision and operation of electricity infrastructure between the H018 Tarong and H014 Middle Ridge Substations.
	Transport Infrastructure	The corridor options do not propose transport infrastructure.

6.2.14 Regional Plans

The study area is subject to two regional plan areas, the South Burnett Regional Plan and the Toowoomba Regional Plan.

6.2.14.1 South Burnett Regional Plan

The SBRP was implemented in 2017 as a statutory instrument providing strategies aiming to address economic, social and environmental issues in the region, including identifying strategic infrastructure and service needs and support economic prosperity.

The transmission line relocation would be consistent with the aim of the South Burnett Regional Plan to provide reliable energy which supports growth in an economically and ecologically sustainable manner. The South Burnett Regional Plan states that development in regional landscapes needs to be responsibly planned to complement, protect, and enhance landscape values, including areas of significant biodiversity value, rural production, scenic amenity, and landscape heritage. Development of the preliminary alignment has aimed to minimise impacts upon land uses and environmental values in the surrounding area.

6.2.14.2 Toowoomba Regional Plan

The Toowoomba Regional Plan was implemented in 2017 as a statutory plan that sets intentions to enable opportunities for economic growth and diversity in the region, to protect areas of regionally significant agricultural production, and to identify infrastructure outcomes that will support economic growth.

The transmission line relocation would be consistent with the aim of maximising economic growth through the provision of electricity infrastructure needed to facilitate new energy and resource developments, which accounts for a large percent of the region's economy. A priority outcome sought for electricity infrastructure in the region is to reinforce electricity generation, transmission and distribution systems in response to forecast industry growth, with consideration of energy efficient efforts. The new transmission line would enable an increasing level of service to the growing energy industry in the region and therefore supports the strategic directions of the Toowoomba Regional Plan.

6.3 Local legislation

The local planning schemes for the South Burnett Regional Council and Toowoomba Regional Council are the South Burnett Regional Council Planning Scheme 2017 and Toowoomba Regional Council Planning Scheme respectively.

Once the land has been designated, development relevant to the designation becomes accepted development under the local planning schemes and as such further planning approval is not required. It is worth noting however, that the Minister may have regard to the local government assessment framework and decisions may be influenced by zoning, land-use intent, and local ordinances and by-laws.

As the local government assessment framework may be relevant in the designation of the land, it is worth noting that the corridor options are zoned as "Open Space" and adjoins Mining (the Meandu Mine) (Extractive industry zone) under both applicable planning schemes. The proposed portion of the transmission line to be relocated, will however be in close proximity to the existing transmission line (to be decommissioned) and will be located adjacent to proposed mining activities within the K2E ASA. Therefore, the proposed infrastructure is not considered to be incompatible with the existing land uses.

6.3.1 Local Laws

Local laws are administered by the *Local Government Act 2009* (LG Act) and are used to regulate matters specific to LGAs. While the approvals framework for this project gives rise to a number of legislative and regulatory exemptions, the local laws imposed by the relevant local governments will still apply and may trigger permits required to be obtained for development. The local laws that may apply to the project are provided as follows.

- South Burnett Regional Council Local Law No. 3 – Community and Environmental Management 2011

- South Burnett Regional Council Local Law No. 4 – Local Government Controlled Areas, Facilities and Roads 2011
- Toowoomba Regional Council Local Law No. 3 – Community and Environmental Management 2011
- Toowoomba Regional Council Local Law No. 4 – Local Government Controlled Areas, Facilities and Roads 2011.

The Community and Environment Management local laws deal with key matters including protection against animals and plant pests, vegetation overgrowth, visual pollution, fire hazards, community safety hazards and noise impacts. The local laws governing Local Government Controlled Areas, Facilities and Roads regulate access to local government controlled areas and prohibit or restrict particular activities on local government-controlled areas or roads. The relevant local councils should be consulted in relation to potential impacts to local government-controlled roads prior to commencement of construction.

6.4 Summary of legislative triggers

The following Table 6.2 provides an overview of the relevant planning and approval requirements potentially triggered by legislation based on the current level of investigation. Note that not all approvals may be required and will depend upon subsequent detailed assessments of site-specific impacts and design solutions. Standard Powerlink requirements detailed under the Electricity Act have not been listed below.

Table 6.2 Summary of legislative requirements

Legislation	Responsible authority	Activity	Licence / permit approval
Commonwealth			
Environment Protection and Biodiversity Conservation Act 1999	Department of Climate Change, Energy the Environment and Water	Should there be the potential for Significant Impact on MNES	EPBC Referral
State			
Planning Act 2016	Department of State Development, Infrastructure, Local Government and Planning	Electricity operating works	Infrastructure Designation
Acquisition of Land Act 1967	Department of Resources	Easement acquisition across freehold and non-freehold land	Voluntary agreement preferred Compulsory acquisition can be undertaken
Nature Conservation Act 1992	Department of Environment and Science	Potential for clearing protected plants	Clearing permit (if protected plants are identified in subsequent field surveys)
		Potential for clearing within a ‘high risk’ flora trigger area	Exempt Clearing Notification (if no protected plants are identified)
		Clearing habitat of least concern (non-colonial) fauna species	Low-Risk Species Management Program

Legislation	Responsible authority	Activity	Licence / permit approval
		Clearing habitat of endangered, vulnerable, near threatened, special least concern or least concern (colonial breeder) fauna species	High-Risk Species Management Program
Vegetation Management Act 1999	Department of Resources	Clearing native vegetation	Land subject to Infrastructure Designation is accepted development (not requiring a development permit for operational works)
Water Act 2000	Department of Resources	Undertaking works within a watercourse which involves excavation, fill or removal of vegetation (Construction of maintenance tracks)	Riverine protection permit (if exemption requirements cannot be met)
Fisheries Act 1994	Department of Agriculture and Fisheries	Waterway barrier works within a waterway (Construction of maintenance tracks)	Land subject to Infrastructure Designation is accepted development (not requiring a development permit for operational works)
Transport Infrastructure Act 1995	Department of Transport and Main Roads	Crossing of State-controlled roads	Agreement required

7 CONCLUSION

WSP was engaged to assess transmission line relocation corridor options for the construction of a new portion of Feeder 831 single circuit 275kV high voltage transmission line between Powerlink's Tarong and Middle Ridge substations.

Based on the results of the assessment process, it was concluded that Option 5 is on balance most suitable for the replacement of the existing portion of Feeder 831. This was primarily due to it avoiding the potential impacts to and from mining activities by the Meandu Mine, having a manageable level of impact to social, and environmental values, being relatively direct and likely to be cost-effective and constructible.

The assessment and selection process was undertaken in compliance with Powerlink's *Site Selection, Easements and Sites – Guideline* (Powerlink, 2018). The methodology used to conduct the assessment included a desktop-based review of key constraints within a defined study area and along the proposed corridor options, identification of key criteria and objectives, and the assessment of the selected corridor options against the key criteria and objectives. The assessment considered a range of criteria based on the physical, natural and social constraints within the study area. In addition, cost and constructability was also considered. It was determined that Option 5 should be taken forward for further engagement and planning for the project.

References

Powerlink (2015), Transmission Network Assets Relocation Investigation Report – Meandu Mine – Feeder 831 Relocation Options Study, Powerlink Queensland, 4 June 2015

Powerlink (2019), Transmission Line Relocation Report: Feasibility Report & Estimate – Meandu Mines Feeder 831 Relocation Works, Powerlink Queensland, 17 May 2019

WSP (2021), Meandu Mine King 2 East Project – Regional Interest Development Approval Assessment Application Report, prepared for TEC Coal Pty Ltd, November 2021

Powerlink (2018) Site Selection, Easements and Sites – Guideline, ASM-GDL-A588593