KOJONUP BESS

Environmental Assessment Report

Final

May 2026

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Environmental Assessment Report

Final

Prepared by
Umwelt (Australia) Pty Limited

On behalf of
Mint Renewables

Project Director:	Rob Karelse
Project Manager:	Megan Stalker
Technical Director:	Rob Karelse
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Executive Summary

Mint Renewables is proposing to develop the Kojonup Battery Energy Storage System (BESS) (the Project) within the Shire of Kojonup, Western Australia, approximately 3 km north-west of the Kojonup town centre. The Project proposes a utility-scale BESS with an indicative installed capacity of up to 100 megawatts (MW) and 800 megawatt-hours (MWh), supporting the integration of renewable energy generation and enhancing reliability and resilience of the South West Interconnected System.

The Project is proposed on predominantly cleared agricultural land adjacent to the existing Kojonup Substation. The Indicative Disturbance Footprint is approximately 8.09 ha, including around 3.6 ha of permanent infrastructure. Proposed infrastructure includes containerised battery units, inverters and transformers, internal access roads and hardstands, underground cabling, an on-site substation, operations and maintenance facilities, stormwater and firewater infrastructure, and ancillary works.

This Environmental Assessment Report (EAR) has been prepared to support a Development Application for the Project under the *Planning and Development Act 2005* (WA). The EAR describes the receiving environment, identifies potential impacts associated with construction and operation, and outlines measures to avoid, minimise, and manage impacts in accordance with the mitigation hierarchy. The assessment has been informed by supporting technical studies addressing hydrology, flora and vegetation, terrestrial fauna, Aboriginal cultural heritage, environmental noise, landscape and visual amenity, and traffic and transport.

Hydrological investigations indicate the site is subject primarily to shallow overland sheet flow during larger rainfall events, with flooding hazards predominantly classified as low. Stormwater and flood mitigation measures (including swales, drainage controls, and on site detention) will be incorporated into detailed design to maintain post development flows consistent with pre development conditions and to avoid significant off site flooding impacts.

The Project Area occurs in a highly modified agricultural landscape where native vegetation persists mainly as fragmented remnants and roadside vegetation. The Project design avoids clearing of remnant native vegetation within the main BESS footprint. However, minor clearing of degraded native vegetation may be required within the indicative disturbance footprint (up to approximately 0.09 ha), subject to detailed design and any required approvals. No Threatened or Priority flora species were recorded during the September 2024 survey, and the Project has been designed to avoid the Eucalyptus Woodlands of the Western Australian Wheatbelt Threatened Ecological Community identified to the west of the Project Area.

A desktop soil assessment indicates that the Project is located within land of moderate to high agricultural capability. However, impacts to soils will be limited to the small indicative disturbance footprint and are expected to be negligible at a local and regional scale. Potential soil risks, including erosion, contamination and acidification, can be effectively managed through standard construction controls. Agricultural practices will continue on the adjoining land during the Project operations.

No registered Aboriginal heritage sites are located within the Project Area. However, parts of the surrounding landscape (including areas of remnant vegetation and drainage features) have the potential to contain previously unrecorded Aboriginal cultural heritage. Further archaeological and ethnographic surveys and consultation will be undertaken prior to ground-disturbing works, and statutory requirements will be completed in accordance with applicable legislation.

Supporting assessments indicate that potential off-site impacts can be managed to an acceptable level. Operational noise from the BESS, in combination with the existing substation, is predicted to comply with the applicable criteria at surrounding noise-sensitive premises under the *Environmental Protection (Noise) Regulations 1997*, based on conservative modelling assumptions. The Landscape and Visual Impact Assessment concluded that visual impacts would be low to negligible from surrounding public viewpoints; further mitigated through landscape screening. Construction traffic would be temporary, with access and any infrequent oversized movements managed through detailed access design, relevant permits and implementation of a Traffic Management Plan.

The Project layout, infrastructure configuration, and disturbance footprint presented in this EAR are indicative and subject to refinement during detailed design, and the environmental assessments have been undertaken based on the current design to inform impact identification and mitigation measures.

Abbreviations

Abbreviation	Definition
ABS	Australian Bureau of Statistics
ACH	Aboriginal Cultural Heritage
ACHIS	Aboriginal Cultural Heritage Information System
AEP	Annual Exceedance Probability
ARR	Australian Rainfall and Runoff
BC Act	*Biodiversity Conservation Act 2016* (WA)
BESS	Battery Energy Storage System
BoM	Bureau of Meteorology
CEMP	Construction Environmental Management Plan
DA	Development Application
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEM	Digital Elevation Model
DFES	Department of Fire and Emergency Services
DPLH	Department of Planning, Lands and Heritage
DPIRD	Department of Primary Industries and Regional Development
DWER	Department of Water and Environmental Regulation
EAR	Environmental Assessment Report
EMF	Environmental Management Framework
EMP	Environmental Management Plan
EPA	Environmental Protection Authority (WA)
EP Act	*Environmental Protection Act 1986* (WA)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
GKB AC	Gnaala Karla Booja Aboriginal Corporation
H1–H5	Flood Hazard Categories
IBRA	Interim Biogeographic Regionalisation of Australia
IBSA	Index of Biodiversity Surveys for Assessment
ILUA	Indigenous Land Use Agreement
IUCN	International Union for Conservation of Nature
LCU	Landscape Character Unit
MNES	Matters of National Environmental Significance
NMP	Noise Management Plan
NVCP	Native Vegetation Clearing Permit
O&M	Operations and Maintenance
PMST	Protected Matters Search Tool
RAV	Restricted Access Vehicle
RIWI Act	*Rights in Water and Irrigation Act 1914* (WA)
SPP	State Planning Policy
TEC	Threatened Ecological Community
TIA	Transport Impact Assessment
VSA	Vegetation System Association

Abbreviation	Definition
VT	Vegetation Type
WA	Western Australia
WKSN AC	Wagyl Kaip Southern Noongar Aboriginal Corporation
ZTV / ZVI	Zone of Theoretical Visibility / Zone of Visual Influence

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Tables

Appendices

1.0 Introduction

1.1 Background

Mint Renewables (Mint) (the Proponent) is proposing to develop the Kojonup Battery Energy Storage System (BESS) (the Project) within the Shire of Kojonup, approximately 3 km north-west of the Kojonup town centre **(**Figure 1.1**).** The Project will accommodate a utility-scale BESS with an indicative capacity up to approximately of 100 MW / 800 MWh and is proposed to be sited on predominantly cleared rural land.

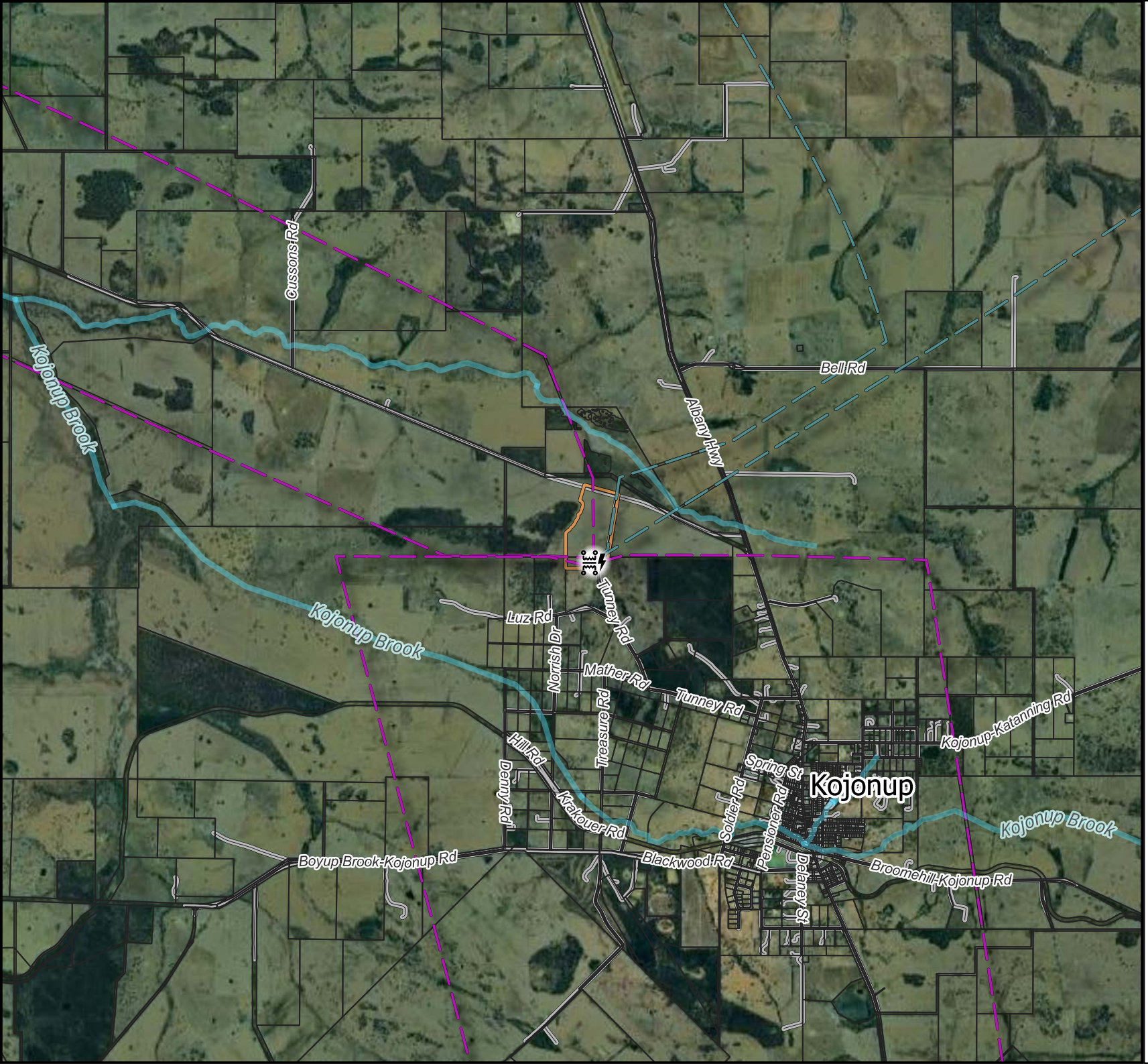
1.2 Project Description

The Proponent is proposing to build a BESS, with an indicative installed capacity of up to approximately 800MWh (100 MW x 8 hours), the Project area and indicative layout can be seen in Figure 1.2. Development is proposed within a Project Area of approximately 34.5 ha, with an Indicative Disturbance Footprint of approximately 8.09 hectares (including around 3.6 ha of permanent infrastructure) (Figure 1.3). The Project will include:

- BESS units, inverters, and transformers.
- Civil and structural works including laying of crushed rock.
- Internal access roads and access (and egress) points.
- Underground cabling (33 kV) to provide a connection between the battery units and inverters and on-site substation.
- On-site substation including transformer to step up from 33 kV to the connection voltage at 132 kV, reactive power support equipment, protection and control devices.
- Underground cabling (132 kV) to connect the onsite substation to the existing Kojonup Substation.
- Permanent Operations and Maintenance (O&M) Facility.
- Water storage (including firefighting water supply and fire water runoff containment / stormwater detention basin).
- A new access point off Collie-Changerup Road (Main Access), and a new access point off Tunney Road (Secondary Access).
- Security fencing.
- Car parking.
- Landscape mitigation screening, as required.
- Business identification signage, at the Main Access point.
- Temporary disturbance for construction compound and laydown and work areas.

The Project layout, infrastructure configuration and disturbance footprint presented in this report are indicative and subject to refinement during detailed design. Environmental assessments have been

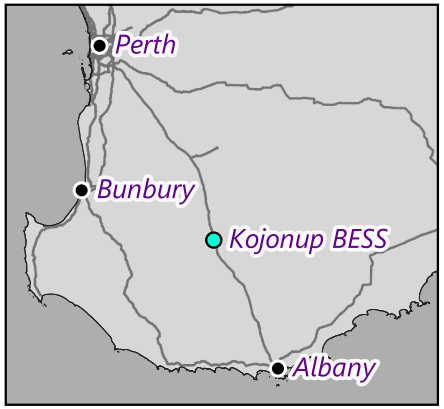
undertaken based on the current design to identify potential impacts and inform appropriate mitigation measures.



KOJONUP BESS - PROJECT LOCATION

Project area
Watercourse
Kojonup Substation
66kV transmission line
132kV transmission line
Roads

0 0.5 1 1.5 km



Mint

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Author:	Liam Dowsett-Clark
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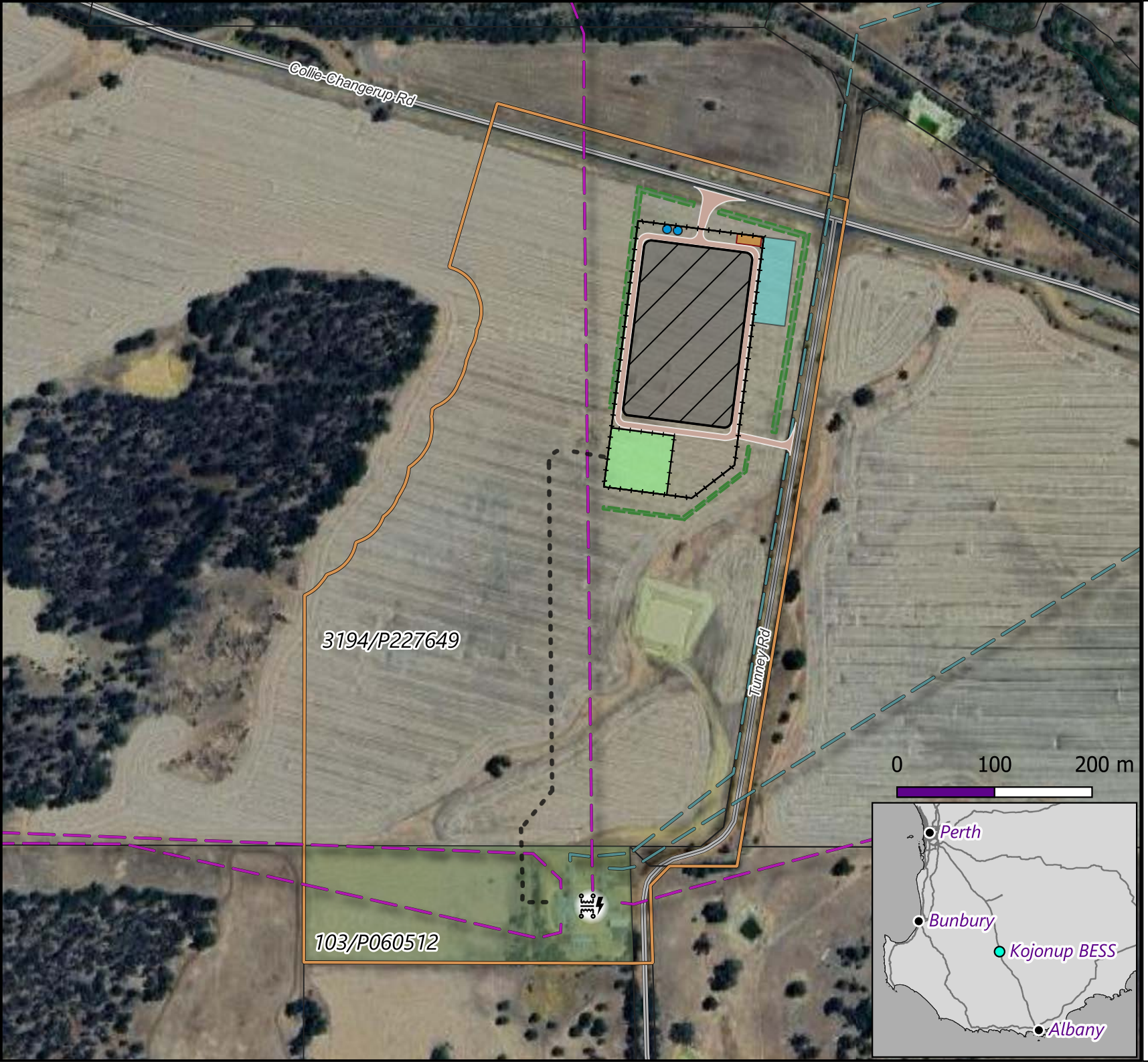

KOJONUP BESS - PROJECT AREA AND INDICATIVE LAYOUT

Indicative Project Infrastructure

- Project area
- Western Power land
- BESS bench
- BESS substation bench
- Underground cable
- Access track
- Detention basin
- Landscape screening
- O&M building and carpark
- Water tank
- Security fence

Existing Infrastructure

- Kojonup Substation
- Existing 66kV transmission line
- Existing 132kV transmission line
- Roads

Mint

N

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KOJONUP BESS - INDICATIVE DISTURBANCE AREA

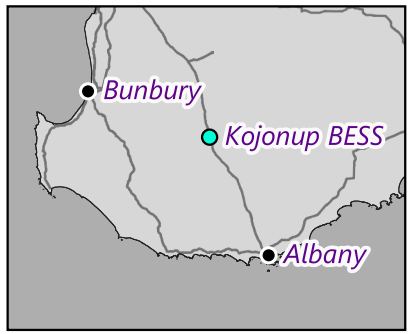
Indicative Project Infrastructure

- Project area
- Western Power land
- Disturbance footprint

Existing Infrastructure

- Kojonup Substation
- Existing 66kV transmission line
- Existing 132kV transmission line
- Roads

0 100 200 m



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1.3 Purpose and Scope

Development approval is required for the Project under the *Planning and Development Act 2005* (WA). This Environmental Assessment Report (EAR) will support the Development Application (DA) by documenting the existing environmental context, identifying potential impacts associated with the Project, and outlining measures to avoid, minimise, and manage those impacts.

The assessment includes an evaluation of potential impacts on flora, vegetation and fauna, including any species or ecological communities listed as Threatened under the *Biodiversity Conservation Act 2016 (BC Act)* or as Matters of National Environmental Significance (MNES) under the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*. All assessments have considered relevant Western Australian Environmental Protection Authority (EPA) guidance and Department of Climate Change, Energy, the Environment and Water (DCCEEW) guidelines.

At the time of lodgement, certain relevant policy and guidance documents are in draft form or under preparation. This assessment has therefore been undertaken with reference to the most current available guidance and accepted methodologies.

1.4 Technical Studies

This EAR includes a summary of the supporting technical reports for each environmental value, as listed in **Table 1.1**.

Table 1.1 Summary of Technical Studies

Environmental Value	Technical Study Scope	Report	Section
Hydrology	Assessment of surface water features, drainage, local hydrological function, flood modelling.	Hydrology Assessment (Water Technology, 2026).	**Section 4.1**
Flora & Vegetation	Desktop assessment, field survey, vegetation mapping, TEC assessment, weed survey.	Reconnaissance and Targeted Flora and Vegetation Survey and Basic Terrestrial Fauna Survey (Umwelt, 2024).	**Section 4.2**
Terrestrial Fauna	Desktop assessment, habitat assessment, targeted black-cockatoo assessment.	Reconnaissance and Targeted Flora and Vegetation Survey and Basic Terrestrial Fauna Survey (Umwelt, 2024).	**Section 4.3**
Soils	Desktop assessment of soil landscape units, agricultural land capability, contamination risk and soil constraints (including acidification potential)	Desktop assessment of DPIRD-015, DPIRD-044, DPIRD-031, DWER-059.	**Section 4.4**
Heritage	Desktop ACH review, ACHIS search, and assessment of heritage potential, constraints and management requirements.	Aboriginal Cultural Heritage Briefing Note (Archae-aus, 2026).	**Section 4.5**
Noise	Desktop review, substation noise measurements, and modelling of BESS operational noise using manufacturer data.	Environmental Noise Assessment (Sonus, 2026).	**Section 4.6.1**
Visual Amenity	Desktop review and visual impact assessment using ZVI/ZTV modelling, viewpoint analysis and photomontages.	Landscape Visual Impact Assessment (UDLA, 2026).	**Section 4.6.2**

Environmental Value	Technical Study Scope	Report	Section
Traffic and Transport	Assessment of road network conditions, site access, traffic generation and heavy vehicle movements, including swept path and sight distance analysis.	Transport Impact Assessment (Flyt, 2026).	**Section 4.6.3**

2.0 Key Environmental Legislation

2.1 *Environmental Protection Act 1986* (Western Australia)

The EP Act is Western Australia's primary environmental legislation, administered by Department of Water and Environmental Regulation (DWER) and supported by the EPA as an independent statutory authority. Part IV of the EP Act outlines the environmental impact assessment process, which evaluates a proposal and the measures available to avoid or mitigate its environmental impact. Proposals that are likely to have a significant environmental effect must be referred to the EPA, which determines whether an assessment is required and sets the level of assessment.

An assessment has been undertaken against the EPA Factor and Objectives guidance (**Table 2.1**), as well as consideration of significance criteria (**Table 2.2**). From this assessment, the Project is unlikely to be considered a "significant proposal" due to the limited environmental values and low quality of the Project Area, the limited extent and low consequence of potential impacts, and the high degree of certainty by which impacts can be predicted. As such referral and assessment under Part IV of the EP Act is unlikely to be required.

Table 2.1 EPA Environmental Factors and Objectives

Theme	Factor	Objective	Assessment
Sea	Benthic communities and habitats	To protect benthic communities and habitats so that biological diversity and ecological integrity are maintained.	Not relevant. The Project is not located near coastal or marine environments, therefore it will not impact coastal or marine environmental values. As such, these factors are not considered relevant and are not discussed further.
	Coastal processes	To maintain the geophysical processes that shape coastal morphology so that the environmental values of the coast are protected.	
	Marine environmental quality	To maintain the quality of the water, sediment and biota so that environmental values are protected.	
	Marine fauna	To protect marine fauna so that biological diversity and ecological integrity are maintained.	
Land	Flora and vegetation	To protect flora and vegetation so that biological diversity and ecological integrity are maintained.	Relevant surveys and assessments have been undertaken for the Project. The Project has been designed to avoid vegetation clearing, a small area of native vegetation (approximately 0.09 ha) may need to be cleared. The mitigation hierarchy has been applied to avoid and minimise direct and indirect impacts to native vegetation, and no significant impacts to flora and vegetation will occur. Further discussion on Flora and Vegetation values is provided in **Section 4.2**.
	Landforms	To maintain the variety and integrity of distinctive physical landforms so that environmental values are protected.	There are no distinctive physical landforms in the vicinity of the Project. The variety and integrity of distinctive physical landforms will not be impacted.

Theme	Factor	Objective	Assessment
	Subterranean fauna	To protect subterranean fauna so that biological diversity and ecological integrity are maintained.	There will not be any material interaction with groundwater as part of the Project and so no risk of impact to subterranean fauna.
	Terrestrial environmental quality	To maintain the quality of land and soils so that environmental values are protected.	Potential soil impacts such as acid sulphate soils and erosion will be managed through the Construction Environmental Management Plan (CEMP).
	Terrestrial fauna	To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.	Relevant surveys and assessments have been undertaken for the Project, and no significant impacts to terrestrial fauna are likely to occur.
Water	Inland waters	To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.	The required hydrological studies have been undertaken and the Project appropriately sited to ensure the regimes and quality of groundwater and surface water are maintained.
Air	Air quality	To maintain air quality and minimise emissions so that environmental values are protected.	Not relevant. The Project is not likely to result in any significant air emissions or impacts to air quality.
	Greenhouse gas emissions	To minimise the risk of environmental harm associated with climate change by reducing greenhouse gas emissions as far as practicable.	Not relevant. There will be no significant greenhouse gas emissions as a result of the Project. As the Project plays a supporting role for renewable energy generation, it will assist in the transition to renewable electricity as coal generators reach their end of life.
People	Social surroundings	To protect social surroundings from significant harm.	The Project has been sited to minimise impacts to social surroundings.
	Human Health	To protect human health from significant harm.	Not relevant. The Project will not involve radioactive materials and as such this factor is not relevant.

Under Part V of the EP Act, a Native Vegetation Clearing Permit (NVCP) is required to clear native vegetation unless an exemption applies. Although the Project has been designed to avoid vegetation clearing, a small area of native vegetation (approximately 0.09 ha) may need to be cleared. Appropriate permits will be sought if required.

2.2 *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)

The EPBC Act, administered by the DCCEEW, is the principal Commonwealth legislative instrument for environmental protection and biodiversity conservation in Australia. It provides the statutory framework for the identification and protection of MNES.

Under the EPBC Act, any action that has the potential to result in a significant impact on one or more MNES must be referred to the Commonwealth Minister for the Environment (or delegate) for a controlled action decision. Actions determined to be a controlled action are subject to formal impact assessment and approval, including the imposition of conditions, prior to the action proceeding.

An assessment for the Project has been undertaken with regard to the EPBC Act significant impact guidelines (Department of the Environment, 2013). Based on the limited extent of native vegetation clearance and the low likelihood of significant impacts to any MNES, it is considered unlikely that the Project will trigger the requirement for referral under the EPBC Act.

Table 2.2 EPBC Referral Criteria Assessment

Referral Criteria	Assessment
Listed threatened species and communities	**Not triggered** The DCCEEW database identified a total of 11 Threatened flora species within a 10 km buffer of the Project Area. One species (*Adenanthos pungens subsp. effusus*; Endangered) is classified as 'likely to occur', and the remaining 10 species 'may occur' within the buffer area only. Full database search results can be found in **Appendix B.** The DCCEEW database identified a total of 17 Threatened fauna species (14 species are birds and three are mammals) recorded or with potential to occur within a 30 km buffer of the Project Area. Of these, the following species or their habitat are classified by DCCEEW as 'known to occur': • *Zanda baudinii* (Baudin's Cockatoo; Endangered). • *Zanda latirostris* (Carnaby's Black Cockatoo; • Endangered). • *Phascogale calura* (Red-tailed Phascogale; • Vulnerable). Additionally, the following species or their habitat are classified by DCCEEW as 'likely to occur': • *Leipoa ocellata (Malleefowl; Vulnerable).* • *Dasyurus geofroii (Chuditch; Vulnerable).* However, field surveys described in **Section 4.2** confirmed that the Indicative Disturbance Footprint does not support habitat of significance for these species. While desktop searches identified listed threatened species with potential to occur in the wider area, field surveys confirmed that the Indicative Disturbance Footprint does not intersect any known threatened flora, threatened ecological communities, or black cockatoo habitat. The Project is therefore not likely to have a significant impact on listed threatened species or communities.
Listed migratory species	**Not triggered** Eight threatened/migratory fauna species were considered to have a moderate likelihood of occurrence (**Section 4.3.2**). However, the Project Area does not contain wetlands that could provide important habitat or support regular use by migratory species.
Ramsar wetlands of international importance	**Not triggered** The Project is located greater than 80 km from the nearest Ramsar wetlands (Lake Muir - Byenup Lagoon). The Project will not impact on any Ramsar wetland of international or national importance.
Commonwealth marine environment	**Not triggered** The Project Area is not within a Commonwealth Marine Environment.
World heritage properties	**Not triggered** There are no world heritage areas within or near the Project.

Referral Criteria	Assessment
National heritage places **This includes:** • **Natural, historic or Indigenous places of outstanding national heritage value.** • **Heritage places on or in Commonwealth lands and waters, or under Australian Government control.** • **Areas on the World Heritage List, or that the minister declares as a World Heritage property.**	**Not triggered** There are no National heritage places within or near the Project.
The Great Barrier Reef Marine Park	**Not triggered** The Project area is not situated within the Great Barrier Reef Marine Park.
Nuclear Actions	**Not triggered** The Project does not involve Nuclear Actions.
A water resource, in relation to coal seam gas development and large coal mining development	**Not triggered** The Project is not a coal seam gas or large coal mining development.

3.0 Environmental Context

3.1 Land Use

The Project is located within the Shire of Kojonup in the Great Southern region of Western Australia, which covers an area of approximately 2,932 km^2 with a population of 1,901 (Australian Bureau of Statistics (ABS), 2021). The Shire comprises a mix of agricultural land, crown reserves, and small rural townsites, with Kojonup functioning as the principal service centre for the surrounding rural community.

The broader region is predominantly rural and sparsely populated, characterised by broadacre farming and large private landholdings, providing opportunities for the Project design to avoid sensitive receptors and minimise amenity impacts. The Project occurs within an established agricultural landscape that has been extensively cleared and modified for cropping, with current land use dominated by generalised agriculture.

Most vegetation surrounding the Project has been highly modified since European settlement and is no longer considered intact remnant vegetation. The area is cleared and used for farming, containing existing rural infrastructure such as access tracks, fencing, a farm dam, and established electricity infrastructure including the Kojonup substation and associated distribution and transmission lines.

All land parcels (**Table 3.1**) within the Project are zoned Rural under the Shire of Kojonup Town Planning Scheme No. 3. The Western Power substation is the closest non-residential building near the Project, and the nearest dwelling is approximately 210 m to the south from the Project Area. Overall, the Project Area reflects a long history of agricultural land use with minimal built development consistent with ongoing rural production activities.

Table 3.1 Associated Land Parcels

Address	Land Description	Status	Easements or Restrictions
3680 Collie-Changerup Rd, Kojonup	Lot 3194 on deposited plan 227649.	Privately owned by host landowners.	None
	Lot 8869 on deposited plan 227649.		
262 Tunney Rd, Kojonup	Lot 103 on deposited plan 60512.	Private (Western Power).	None

3.2 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the DWER to protect important environmental values such as Threatened flora, Threatened Ecological Communities (TEC)s, or significant wetlands.

There are no known ESAs within the Project Area (Department of Water and Environmental Regulation (DWER), 2023). A desktop assessment identified the following conservation reserves within a 10 km buffer surrounding the Project Area, none of which are classified as ESA:

- Myrtle-Benn Flora and Fauna Sanctuary – located approximately 1 km to the south-east of the Project Area.

- Unnamed Department of Biodiversity, Conservation and Attractions (DBCA)managed nature reserve – protected under Section 5(1)(d) of the *Conservation and Land Management Act 1984* (WA), approximately 1.6 km south of the Project Area, reserved for flora and fauna conservation.
- Unnamed nature reserve located approximately 5.8 km southwest of the Project Area.

3.3 Climate

Long term mean monthly precipitation and monthly precipitation data for the 12 months preceding the survey at Kojonup Station (10582, data from 1885 to current), as well as the long term mean maximum monthly temperature and monthly maximum temperature for the 12 months preceding the survey at Katanning Station (10916, data from 1999 to current) (BoM, 2026) are shown in **Figure 3.1**. Temperature data was not sourced from Kojonup Station, as records were discontinued in 1997. Katanning Station is located 45 km northeast of the Project Area.

Long-term average monthly maximum temperatures at Katanning peak from December to February (33.1 °C – 32.0 °C), while long-term average monthly precipitation at Kojonup peaks from May to August (a total of 311.6 mm received over this period on average) (**Figure 3.1**).

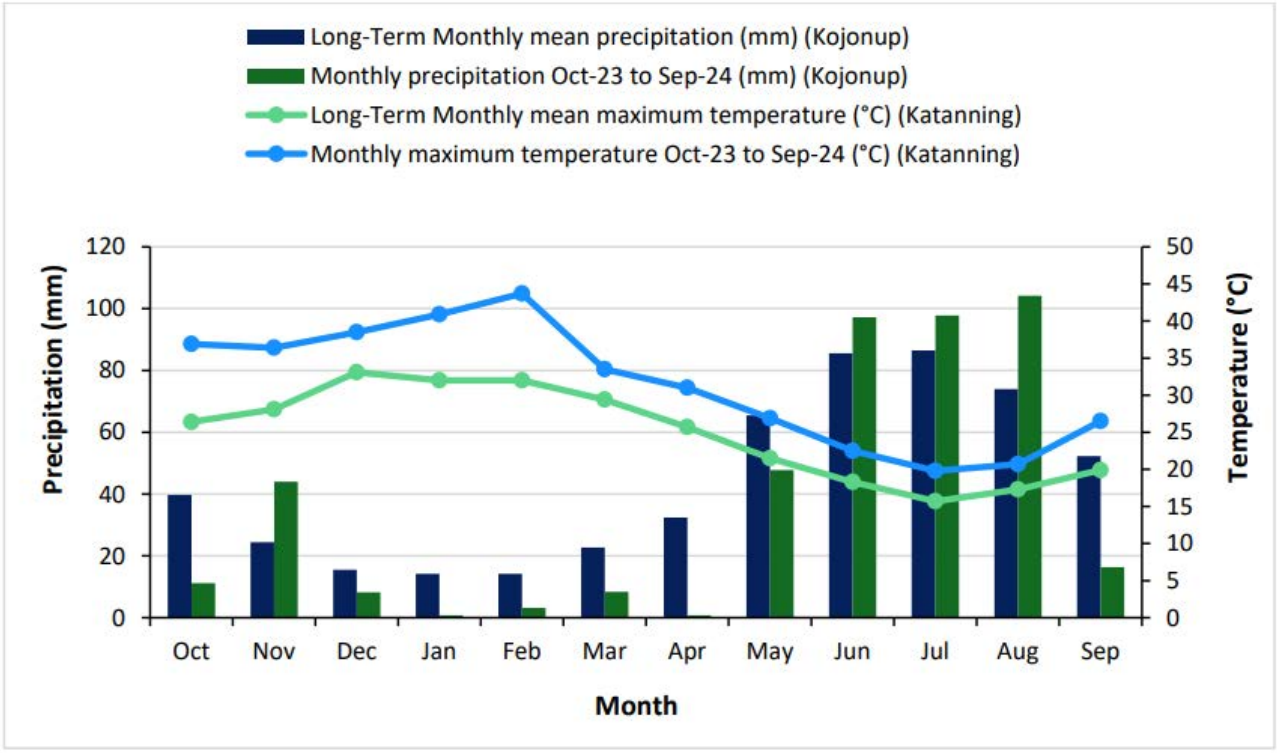


Figure 3.1 Climate Statistics for Katanning (Station 10916) and Kojonup (Station 10582)

3.4 Topography

The Project Area comprises gently undulating topography that generally falls toward the north, with elevations ranging from approximately 290 mAHD to 330 mAHD as interpreted from 2 m contour mapping and a 1 m resolution Digital Elevation Model (DEM) (Water Technology, 2026).

4.0 Potential Impacts and Mitigations

Potential impacts and appropriate mitigations during construction and operations have been assessed through a range of studies. This provides an initial assessment of risks and potential impacts from the Project and will form the basis for a Construction Environmental Management Plan (CEMP) which will be developed and implemented for the Project.

The following sections provide a summary of the studies completed, potential impacts, and proposed mitigations during construction and operations. Further details are provided in **Appendix A** to **Appendix G.**

4.1 Hydrology

4.1.1 Supporting Studies

A hydrological assessment was undertaken for the Project which included hydrologic and hydraulic modelling to characterise surface water conditions. Detailed methods and results are provided in the Hydrological Assessment report (**Appendix A**) by Water Technology (2026).

4.1.2 Receiving Environment

The Project is located within a predominantly agricultural catchment characterised by gently undulating topography and shallow overland flow paths. Surface water runoff across the site generally flows north towards Collie-Changerup Road and ultimately drains to Kojonup Brook (Murchison River system). Flooding behaviour within the Project is driven primarily by local catchment runoff rather than riverine flooding.

Hydrological modelling indicates that flooding across the Project Area is typically shallow and characterised by sheet flow, with limited defined drainage channels. The modelled flood hazard is predominantly classified as H1, representing a relatively low-risk flood zone that is generally safe for vehicles, people and buildings during flood events and is suitable for BESS development.

Localised areas of deeper water are predicted where ponding occurs behind road embankments and where more channelised flow paths concentrate, including at locations where existing flow paths have been culverted under Collie-Changerup Road. While these areas have a higher hazard rating than the surrounding sheet flow, the calculated hazard remains low overall, and it is anticipated the deeper, localised inundation can be traversed by vehicle.

The Proponent has consulted with the DWER regarding the licensing requirements for the proposed BESS. Based on DWER advice, the site is located within a ‘non-proclaimed’ area for groundwater and, as such, no water licensing is required under the *Rights in Water and Irrigation Act 1914* for groundwater abstraction.

4.1.3 Potential Impacts

The hydrological assessment has identified the following potential impacts prior to mitigation and management:

- Minor changes to existing surface water flow paths due to ground disturbance, cut and fill activities, and the placement of infrastructure within areas subject to shallow overland sheet flow.
- Localised afflux and changes in flood behaviour where infrastructure intersects natural drainage pathways or existing road drainage infrastructure, including culverts along Collie-Changerup Road.
- Increased runoff and modified drainage patterns resulting from the introduction of compacted or impervious surfaces, with a corresponding risk of erosion along preferential flow paths if not appropriately managed.
- Localised areas of higher flood hazard (H4–H5) associated with defined flow paths, which may constrain the placement of sensitive infrastructure and require avoidance or mitigation through detailed design.
- Temporary impacts to water quality during construction, including increased sediment mobilisation and the potential for hydrocarbon contamination associated with earthworks and vehicle movements.
- Periodic impacts to site access and egress during larger rainfall events (greater than the 5% AEP); however, modelling indicates flood hazards are generally low and safe access is expected to be maintained via Collie-Changerup Road, Tunney Road and Albany Highway.

4.1.4 Mitigation and Management

Mitigation and management measures have been developed to address the identified hydrological impacts (further detailed in **Appendix A**):

- The Project infrastructure has been sited to avoid natural drainage lines and areas subject to concentrated flow, with development largely confined to areas characterised by shallow sheet flow and low flood hazard.
- To minimise afflux and altered flood behaviour near drainage infrastructure, swales, culverts, and drainage crossings will be designed to maintain existing flow conveyance and hydraulic connectivity, with backflow prevention incorporated where required.
- To address increased runoff and erosion risk from compacted or impervious surfaces, a stormwater management system comprising perimeter swales and an on-site detention basin will intercept and attenuate runoff, ensuring post-development discharge rates are comparable to pre-development conditions.
- To avoid impacts associated with higher flood hazard areas, infrastructure layout and finished design levels will avoid areas modelled as H4–H5 hazard, with sensitive infrastructure designed to remain above predicted 1% AEP flood levels.
- To minimise temporary water quality impacts during construction, erosion and sediment control measures will be implemented through a Construction Environmental Management Plan (CEMP), including management of disturbed areas, stabilisation of exposed surfaces, and appropriate handling of fuels and hazardous substances.
- To manage periodic impacts to site access and egress during larger rainfall events, access routes have been assessed under design flood conditions and will be supported by an Emergency

Management Plan (EMP), and prepared prior to construction, outlining procedures for safe access, monitoring, and response during extreme rainfall events.

4.2 Vegetation and Flora

4.2.1 Supporting Studies

A reconnaissance and targeted flora and vegetation survey was conducted for the Project on 25 and 26 September 2024 to determine the flora, vegetation, and fauna values. The area surveyed included the current Project Area and adjacent areas (**Appendix B**). The surveys have been used to inform Project design and provide suitable information for this environmental assessment report.

4.2.2 Receiving Environment

4.2.2.1 Vegetation Types

The Project is located in the Southern Jarrah Forest (JF2) subregion of the Jarrah Forest Interim Biogeographic Regionalisation of Australia (IBRA) region. The Southern Jarrah Forest subregion is characterised by a warm Mediterranean climate (Hearn et al., 2002) and as such experiences wet, cool winters and hot, dry summers.

Pre-European vegetation mapping (Beard, 1976; Beard et al., 2013, p. 201; Shepherd et al., 2002) identifies one Vegetation System Association (VSA) occurring within the Project: Jingalup_4 (**Table 4.1**). The VSAs comprises jarrah *(Eucalyptus marginata)*, marri *(Corymbia calophylla)* and wandoo *(E. wandoo)* woodlands, representing the dominant association locally.

The current extent, remaining proportion of pre-European vegetation, and conservation protection levels for these VSA are summarised in **Table 4.1**. As of 2019, this VSA has less than 30% pre-European extent remaining within the Southern Jarrah Forest subregion, placing it below the threshold considered adequate for regional retention. Current extent protected for conservation is also low based on the DBCA-Legislated Lands and Waters dataset (DBCA, 2025), which includes Crown reserves and lands managed under Section 8A of the *Conservation and Land Management Act 1984* (WA) with International Union for Conservation of Nature (IUCN) categories I–IV.

Although the vegetation is not formally reserved, its low remaining extent and fragmentation within the region mean that remnant patches contribute to local biodiversity and landscape connectivity within an otherwise highly cleared agricultural setting.

Table 4.1 Vegetation System Associations of the Project Area

VSA	Name and Description	Current Extent[1] (ha)	Pre-European Extent Remaining[1] (%)	Current Extent Protected for Conservation[1] (%)
4	**Jingalup_4** Jarrah, marri and wandoo *Eucalyptus marginata, Corymbia calophylla, E. wandoo*.	35,568.5	21.3	1.08

[1] Data source: DBCA Statewide Vegetation Statistics: Full Report (DBCA, 2019).
[2] Data source: Pre-European Vegetation Mapping (DPIRD, 2019).

Four vegetation types (VTs) were mapped during the field survey, of which two occur in the current Indicative Disturbance Footprint (**Figure 4.1**). VT3 occurs along Tunney Road verge and consists of mixed eucalypt and sheoak woodland with isolated shrubs and pasture grasses. VT2 is present in a small area adjacent to the substation, containing a subset of VT3 species. The remainder of the Indictive Disturbance Footprint is cleared.

Table 4.2 Vegetation Types within Indicative Disturbance Footprint

VT	Description	Extent within Survey Area (ha)	Extent within Indicative Disturbance Footprint (ha)
Native Vegetation			
1	Mid woodland to mid open forest of Eucalyptus wandoo subsp. wandoo usually with *Eucalyptus astringens* subsp. *astringens*, occasionally with *Eucalyptus marginata* subsp. marginata and/or *Corymbia calophylla*, over low isolated clumps of shrubs of *Hibbertia commutata* and *Bossiea eriocarpa*, over low isolated clumps of tussock grasses of *Vulpia bromoides and **Aira cupaniana*, over low isolated clumps of forbs of *Millotia tenuifolia* var. *tenuifolia*, *Trachymene pilosa* and **Romulea rosea*, on slopes with grey sandy loam, and laterite coarse fragments.	22.9 ha (15.1%)	0
2	Mid open woodland of *Allocasuarina huegeliana* over tall shrubland of *Banksia sessilis* var. *sessilis*, over low sparse shrubland of *Styphelia erectifolia, Hibbertia commutata* and *Acacia lasiocarpa* var. *bracteolata* over mid isolated clumps of sedges of *Lepidosperma leptostachyum* over low tussock grassland of **Ehrharta longiflora* and *Neurachne alopecuroidea*, on slopes with brown sandy loam and laterite coarse fragments.	0.5 ha (0.3%)	0.06
3	Mid open woodland of mixed species including *Corymbia calophylla*, *Eucalyptus marginata* subsp. *marginata*, *Eucalyptus wandoo* subsp. *wandoo, Allocasuarina huegeliana* and *Eucalyptus astringens* subsp. *astringens*, over tall isolated clumps of shrubs of *Hakea prostrata* and *Banksia sessilis* var. *sessilis*, over low isolated clumps of shrubs over closed tussock grassland of pasture weeds.	2.9 ha (1.9%)	0
4	Low isolated trees of *Corymbia calophylla* over tall sparse to open shrubland of *Jacksonia sternbergiana* and/or *Allocasuarina huegeliana* over mixed native shrubland, over pasture weeds.	0.8 ha (0.5%)	0.03
Highly Modified Areas			
Cl	Cleared paddocks with isolated paddock trees, includes roads, tracks and infrastructure.	123.1 ha (81.5%)	8.0*
Dm	Artificial dam.	0.3 ha (0.2%)	0
Pn	Mid open woodland of planted trees of *Eucalyptus camaldulensis* over isolated clumps of shrubs to mid open shrubland of remnant native shrubs over tussock grassland of pasture weeds.	0.1 ha (0.01%)	0
Dr	Low to mid isolated trees of unidentified Eucalypts over closed tussock grassland of pasture weeds, located along a drainage line.	0.5 ha (0.3%)	0

*Note that the Project Area was redefined after the VTs were mapped. There is a small area (~0.04 ha) at the northern most aspect of the Survey Area that has not been mapped for VTs. Satellite imagery/site photos confirm that this area entirely bituminised (as part Collie-Changerup Rd) and is therefore considered to be cleared. This 0.04 ha is not reflected in the 8.0 ha presented in the above table.

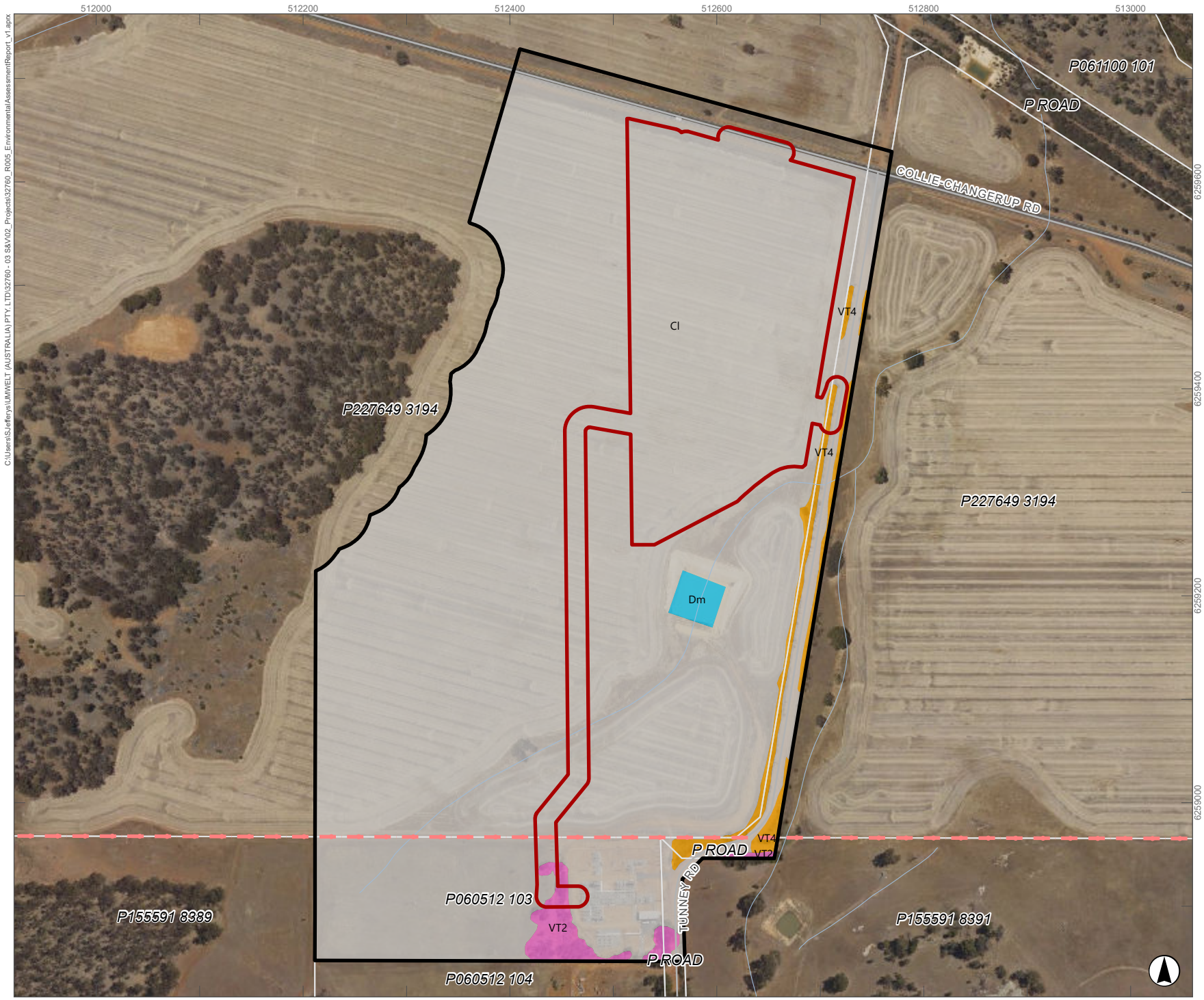


FIGURE 4.1

Vegetation Types in the Project Area

Legend

- Project Area
- Disturbance Footprint
- Kojonup Townsite Boundary
- Road
- Watercourse
- Property Boundary

Vegetation Type

- VT2 Mid open woodland of *Allocasuarina huegeliana* over tall shrubland of *Banksia sessilis* var. *sessilis*, over low sparse shrubland of *Styphelia erectifolia*, *Hibbertia commutata* and *Acacia lasiocarpa* var. *bracteolata* over mid isolated clumps of sedges of *Lepidosperma leptostachyum* over low tussock grassland of **Ehrharta longiflora* and *Neurachne alopecuroidea*, on slopes with brown sandy loam and laterite coarse fragments
- VT4 Low isolated trees of *Corymbia calophylla* over tall sparse to open shrubland of *Jacksonia sternbergiana* and/or *Allocasuarina huegeliana* over mixed native shrubland, over pasture weeds
- CI Cleared paddocks with isolated paddock trees, includes roads, tracks and infrastructure
- Dm Artificial dam

0 100 200 m

Scale 1:5,000 at A4
GDA2020 MGA Zone 50

Image Source: Landgate (2024) | **Data Source:** Landgate (2022, 2026), Umwelt (2026), Mint (2026)

4.2.2.2 Vegetation Condition

The Project Area vegetation is predominantly mapped as Completely Degraded due to extensive historical clearing and the presence of only isolated remnant trees (**Table 4.3** and **Figure 4.2**). During the survey, areas of vegetation were mapped as Degraded and Good condition, however these are primarily associated with remnant native vegetation that has been avoided by the current Project Area. No areas were recorded in Pristine, Excellent, or Very Good condition.

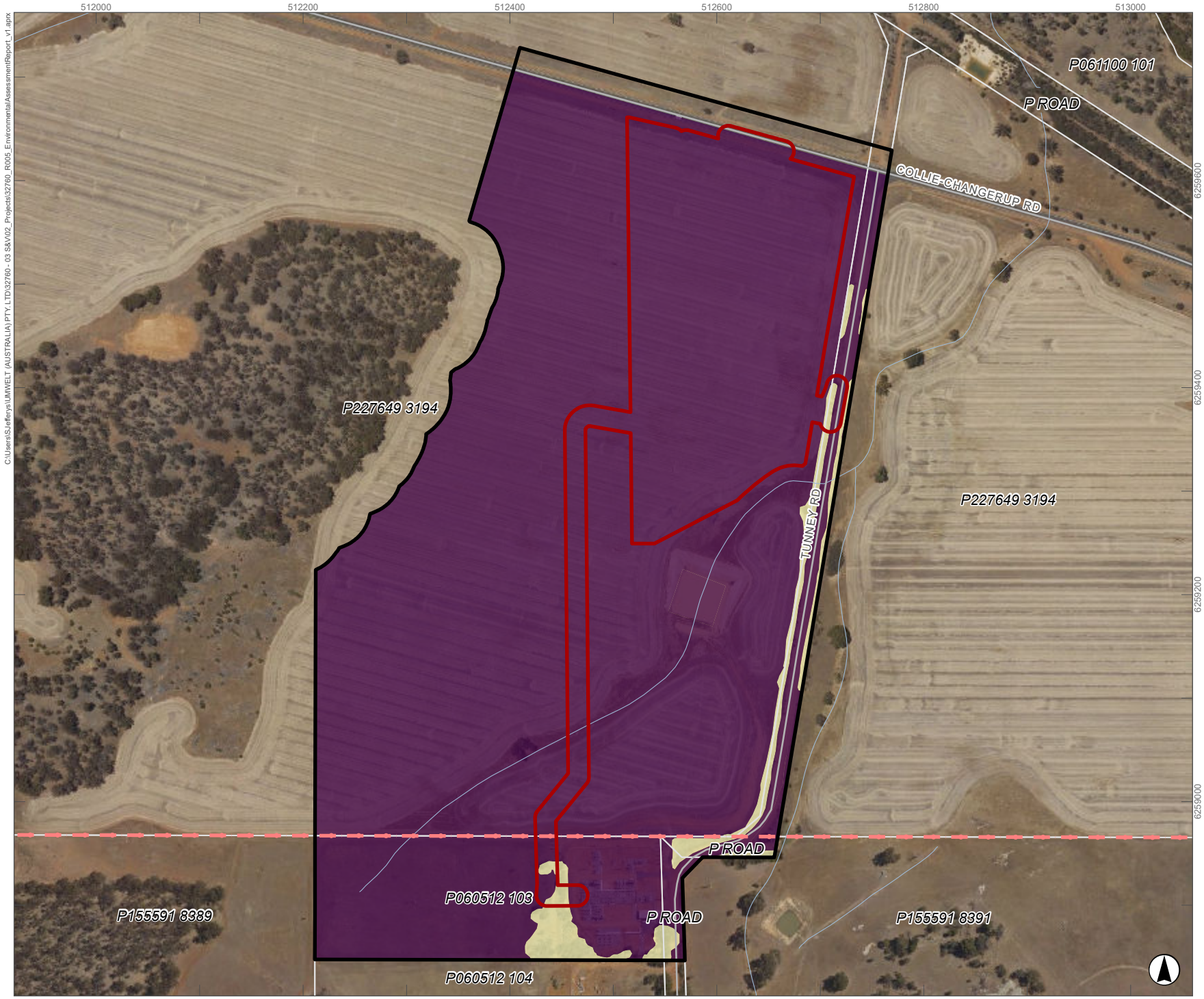
Table 4.3 Vegetation Condition in the Indicative Disturbance Footprint

Vegetation Condition	Extent within Survey Area (ha)	Extent within Indicative Disturbance Footprint (ha)
Good	10.9	0
Degraded	15.5	0.09
Completely Degraded	124.7	8.0*
Total	**151.1**	**8.09**

*This area is equivalent to VT Cl.

FIGURE 4.2

Vegetation Condition in the Project Area



Legend

- Project Area
- Disturbance Footprint
- Kojonup Townsite Boundary
- Road
- Watercourse
- Property Boundary

Vegetation Condition

- Degraded
- Completely Degraded

0 100 200 m

Scale 1:5,000 at A4
GDA2020 MGA Zone 50

Image Source: Landgate (2024) | **Data Source:** Landgate (2022, 2026), Umwelt (2026), Mint (2026)

4.2.2.3 Significant Vegetation Communities

Vegetation was assessed against criteria for three significant ecological communities identified during the desktop assessment, two of which were determined to be unlikely to occur due to unsuitable soils and the absence of diagnostic species. One community, the Eucalypt Woodlands of the Western Australian Wheatbelt TEC, was considered likely to occur based on vegetation structure, dominant tree species, and understorey characteristics.

A single patch of vegetation in the Survey Area, corresponding to VT1, was identified as meeting the diagnostic criteria for the TEC. This patch covers approximately 22.8 ha and occurs in a combination of 'Good' and 'Degraded' condition. The TEC patch is located to the west of the Project Area, with a minimum buffer of 40 m applied (**Figure 4.3**). No works or disturbance will occur within this TEC area and will not be cleared as part of the Project. Other vegetation types within the Project Area do not meet the TEC requirements due to condition, understorey composition, or insufficient patch size.

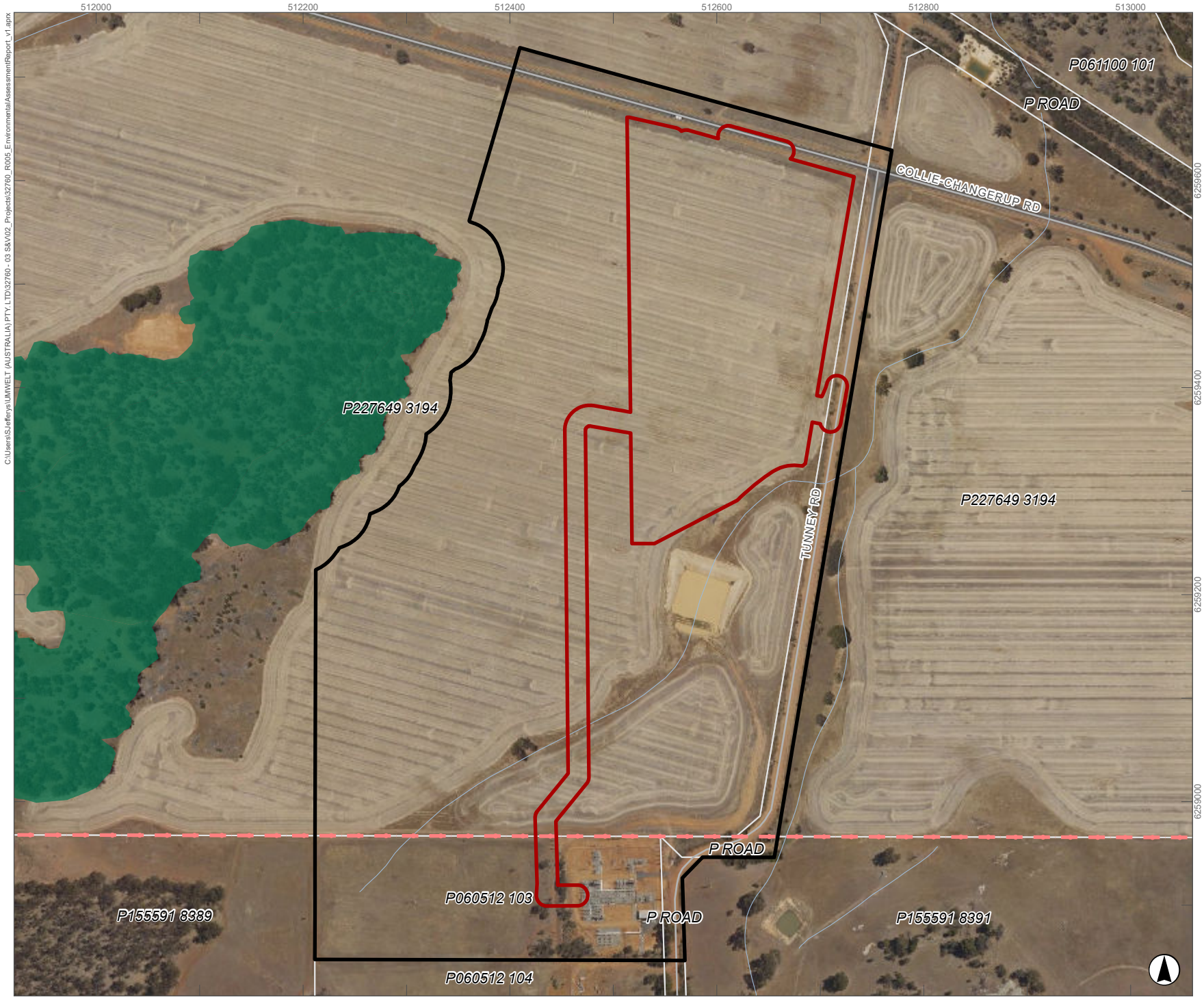


FIGURE 4.3

Eucalyptus Woodlands of the Western Australian Wheatbelt TEC

Legend

- Project Area
- Disturbance Footprint
- Kojonup Townsite Boundary
- Road
- Watercourse
- Property Boundary
- TEC

0 100 200 m

Scale 1:5,000 at A4
GDA2020 MGA Zone 50

Image Source: Landgate (2024) | **Data Source:** Landgate (2022, 2026), Umwelt (2026), Mint (2026)

umwelt

4.2.2.4 Flora

A desktop assessment (including database searches such as DBCA and the Protected Matters Search Tool (PMST)) identified 86 significant flora taxa within 30 km of the Project Area. Of these, 12 taxa were considered potentially occurring in the Survey Area and seven taxa were assessed as possibly occurring based on habitat suitability and proximity of known records (generally within ~5 km). These taxa were all identifiable during the survey period due to either being during the flowering period, or identifiable when sterile.

During the survey (September 2024) a total of 90 vascular flora taxa from 31 plant families were recorded within the Survey Area. The assemblage recorded is consistent with a highly modified agricultural landscape where remnant native vegetation persists as fragmented patches.

No Threatened or priority flora species listed under the BC Act or EPBC Act were recorded during the survey. It was noted that significant flora taxa that are cryptic or small in size may not have been identified during the survey if present (Umwelt, 2024).

No significant flora taxa identified during the desktop assessment were recorded during the field survey.

There were 23 introduced taxa recorded during the reconnaissance survey, representing approximately 28% of the total flora assemblage. Most introduced taxa recorded were common pasture weeds associated with disturbed soils. One Declared Pest species under the *Biosecurity and Agriculture Management Act 2007, Asparagus asparagoides*, was recorded within the Survey Area during survey period.

4.2.3 Potential Impacts

Potential impacts to flora and vegetation values as a result of the Project may include:

- Localised loss of native flora and vegetation within an already highly modified landscape due to clearing, noting the Project Area is mostly cleared.
- Spread of introduced flora species, including the Declared Pest *Asparagus asparagoides*, as a result of ground disturbance and vehicle movement.
- Indirect impacts associated with erosion, sedimentation, contamination, or dust.

4.2.4 Mitigation and Management

Mitigation and management measures have been developed to directly address the identified flora and vegetation impacts and are informed by the Project design and supporting technical studies.

- The Project has been sited and designed to avoid clearing of native vegetation as far as practicable. Infrastructure is preferentially located within previously cleared agricultural land. Remnant native vegetation of higher ecological value within the Project has been excluded from disturbance, with a 40 m buffer (i.e. no-go area) applied to prevent inadvertent impacts.
- The native vegetation clearing of 0.09 ha is the maximum clearing extent at the conceptual design stage to provide construction flexibility. Detailed design will seek to further reduce native vegetation clearing. Additionally, to minimise disturbance to vegetation adjacent to works, clearly defined construction boundaries and no-go areas will be established prior to construction.

- Indirect impacts will be further managed through implementation of CEMP, including measures to control runoff, erosion, and dust generated by construction activities.
- To prevent the spread of introduced flora species, including the Declared Pest *Asparagus asparagoides*, weed hygiene and management measures will be implemented through the CEMP. These will include vehicle and machinery hygiene procedures, management of disturbed soils, and avoidance of unnecessary ground disturbance, particularly in areas supporting native vegetation.

4.3 Terrestrial Fauna

4.3.1 Supporting Studies

Survey methods for terrestrial fauna were developed and implemented based on a combination of desktop assessment and field survey methodologies. Detailed survey and analysis methods can be found in the terrestrial fauna survey report (**Appendix B**).

4.3.2 Receiving Environment

4.3.2.1 Fauna Habitats

The Survey Area consisted of small, fragmented patches of remnant vegetation, including road verges, surrounded by agricultural land. Six Fauna Habitat Types (FHT) were identified during field investigations; only three of those occur in the Indicative Disturbance Footprint (**Table 4.4** and **Figure 4.4**). Although many remnant patches have been affected by weed invasion and grazing, they continue to provide some habitat value for local fauna. Connectivity across the landscape is limited, with only small remnants available for fauna movement.

Table 4.4 Fauna Habitat Types of the Project Area

Fauna Habitat Type	Associated Vegetation Types	Area (ha) mapped in Survey Area	Area (ha) mapped in Indicative Disturbance Footprint
Eucalyptus Woodland (Ew)	VT1	22.9 ha (15.1%)	0 (0%)
Allocasuarina Woodland (Aw)	VT2	0.5 ha (0.3%)	0.06 (0.7%)
Mixed Woodland (Mw)	Dr, Pn, VT3	3.5 ha (2.3%)	0 (0%)
Mixed Shrubland (Ms)	VT4	0.8 ha (0.5%)	0.03 (0.4%)
Cleared (Cl)	Cl	123.2 ha (81.5%)	8.0* (98.9%)
Artificial Dam (Dm)	Dm	0.3 ha (0.2%)	0 (0%)
Total		**151.2 ha (100%)**	**8.09 ha (100%)**

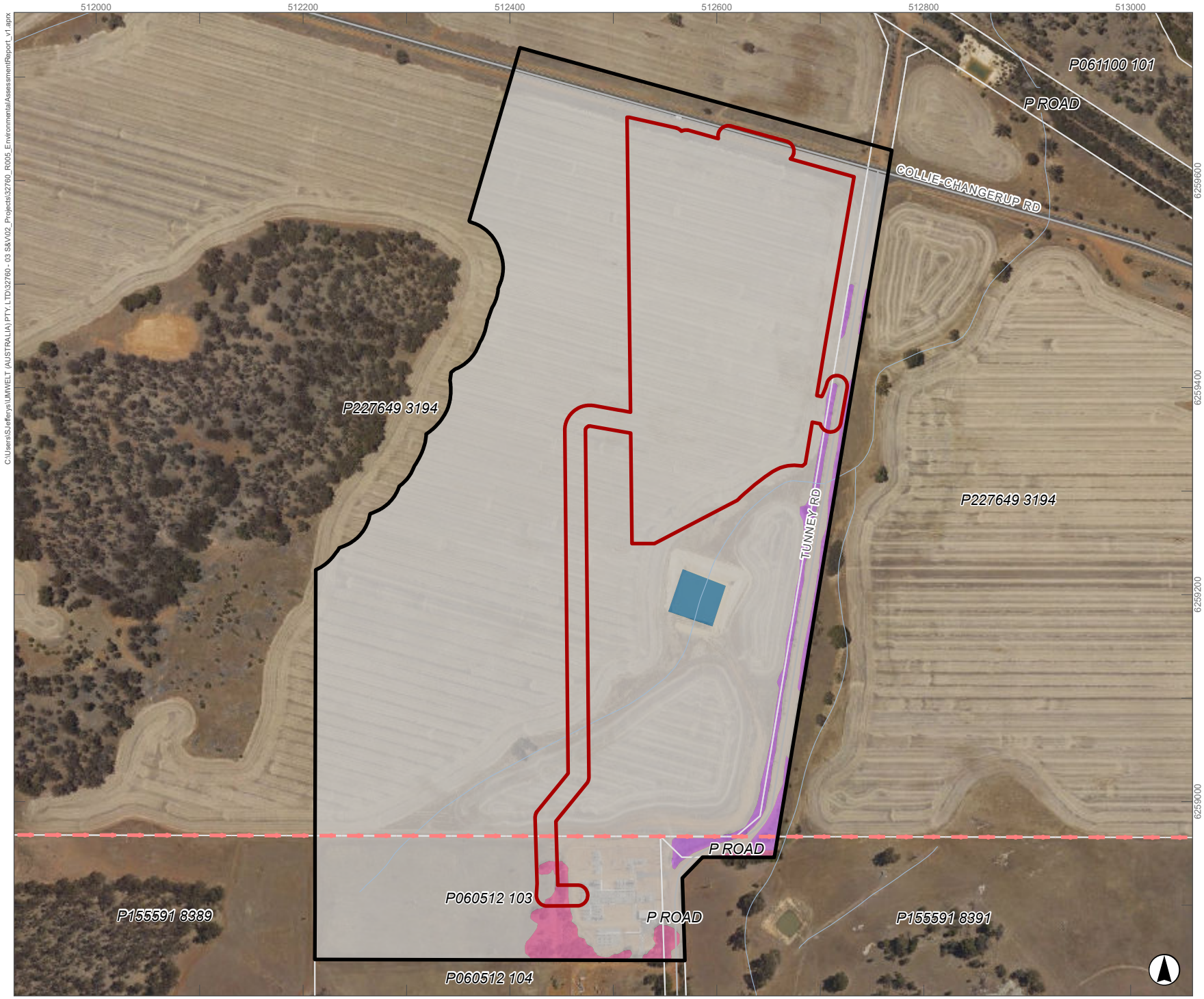


FIGURE 4.4

Fauna Habitat Types in the Project Area

Legend

- Project Area
- Disturbance Footprint
- Kojonup Townsite Boundary
- Road
- Watercourse
- Property Boundary

Fauna Habitat Type

- Aw Mid open woodland of *Allocasuarina huegeliana* over tall shrubland of *Banksia sessilis* var. *sessilis*, over low sparse shrublands, sedges and grasses, on slopes with brown sandy loam and laterite coarse fragments
- Ms Low isolated trees of *Corymbia calophylla* over tall sparse to open shrubland of *Jacksonia sternbergiana* and/or *Allocasuarina huegeliana* over mixed native shrubland, over pasture weeds
- Cl Cleared paddocks with isolated paddock trees, includes roads, tracks and infrastructure
- Dm Artificial dam

0 100 200 m

Scale 1:5,000 at A4
GDA2020 MGA Zone 50

Image Source: Landgate (2024) | **Data Source:** Landgate (2022, 2026), Umwelt (2026), Mint (2026)

4.3.2.2 Fauna of Conservation Significance

Field investigations recorded vertebrate fauna assemblages typical of a highly modified agricultural landscape, with only one conservation-significant species, the Western Rosella *(Platycercus icterotis xanthogenys)* (inland) (EPBC status – N/A, WA status – P4) confirmed during the survey. No additional listed taxa were observed directly or indirectly, despite targeted inspection of suitable habitat features.

A desktop assessment identified other conservation-significant species with the potential to occur within the Project Area. These are discussed below in **Table 4.5** and **Table 4.6**.

Black Cockatoos

A targeted habitat assessment was undertaken during the field survey to evaluate suitability for the three threatened Black-Cockatoo species known from the broader Kojonup region: Forest Red-tailed Black-Cockatoo, Baudin's Black-Cockatoo, and Carnaby's Black-Cockatoo.

The assessment considered breeding habitat availability, foraging resources, roosting potential, watering points, and overall habitat value using both the Bamford (2022) and DCCEEW (2022) habitat assessment frameworks.

No individuals or indirect evidence of Black-Cockatoo use were recorded during field surveys. Nonetheless, habitat attributes indicate the remnant vegetation to the west of the current Project Area may function as secondary habitat within the wider agricultural landscape. A comparative summary of habitat values for each species is provided in **Table 4.5**. The Project Area avoids this area of remnant vegetation.

Table 4.5 Summary of Black-cockatoo Habitat Values Adjacent to Project Area

Attribute	Forest Red-tailed Black-Cockatoo (VU)	Baudin's Black-Cockatoo (EN)	Carnaby's Black-Cockatoo (EN)
Regional occurrence	Known breeding resident in the wider region.	Occurs at eastern edge of range, irregular visitor.	Known seasonal breeding migrant in region.
Likelihood of occurrence in Project Area	Likely.	Possible (irregular).	Likely.
Recorded during survey	Not recorded, no indirect evidence.	Not recorded, no indirect evidence.	Not recorded, no indirect evidence.
Breeding habitat availability	14 potential nest trees meeting DCCEEW criteria present.	14 potential nest trees meeting DCCEEW criteria present.	14 potential nest trees meeting DCCEEW criteria present.
Nest tree quality (Bamford)	Rank 3 potential breeding trees.	Rank 3 potential breeding trees.	Rank 3 potential breeding trees.
Breeding likelihood within site	Possible where hollow-bearing trees occur.	Possible where hollow-bearing trees occur.	Possible where hollow-bearing trees occur.
Foraging habitat availability	Limited preferred food species present as scattered individuals or small patches.	Similar limited availability.	Slightly higher suitability in Allocasuarina/Mixed Woodland patches.
Foraging evidence recorded	None.	None.	None.
Bamford foraging score	Overall FHQS: 2/10 (Low).	Overall FHQS: 2/10 (Low).	Overall FHQS: 2/10 (Low).
DCCEEW foraging value	Negligible-Low (locally Low-Moderate in small patches).	Negligible-Low (locally Low-Moderate in small patches).	Low-Moderate in limited woodland patches.

Attribute	Forest Red-tailed Black-Cockatoo (VU)	Baudin's Black-Cockatoo (EN)	Carnaby's Black-Cockatoo (EN)
Night roosting potential	The Project is unlikely to support roosting; nearest known roost ~1 km south.	The Project is unlikely to support roosting; nearest known roost ~1 km south.	The Project is unlikely to support roosting; nearest known roost ~1 km south.
Water availability	Farm dams may provide opportunistic seasonal watering points.	Farm dams may provide opportunistic seasonal watering points.	Farm dams may provide opportunistic seasonal watering points.

Other Significant Fauna

A small number of additional conservation significant species may occur in and around the Project Area based on habitat characteristics. Although none were recorded during field surveys, habitat structure, connectivity, and disturbance history were used to assess their likelihood of occurrence and the site's ecological function. A summary of these assessments is provided in **Appendix B.**

Table 4.6 Assessment of Other Conservation Significant Fauna Species

Species	Habitat Suitability within Project Area	Evidence Recorded During Survey	Landscape Function of Site	Overall Habitat Value
Peregrine Falcon (*Falco peregrinus*)	Open farmland provides foraging airspace; lacks cliffs or tall nesting structures; occasional hunting habitat only.	None	Transient foraging habitat only	Low
Western Rosella (Inland) (*Platycercus icterotis xanthogenys*)	Woodland remnants provide limited foraging and shelter resources; fragmented habitat reduces suitability.	None	Secondary woodland habitat	Low–Moderate
Chuditch (*Dasyurus geoffroii*)	Highly fragmented landscape with limited dense understorey and hollow logs; lacks core habitat features.	None	Marginal dispersal habitat at best	Low
Red-tailed Phascogale (*Phascogale calura*)	Requires large intact woodland with hollow-bearing trees and complex ground structure; habitat largely cleared.	None	Highly degraded remnant habitat	Low
Western Brush Wallaby	Small woodland/shrubland patches may provide temporary shelter; surrounding clearing reduces persistence potential.	None	Secondary refuge habitat	Low

4.3.3 Potential Impacts

The Project Area is situated within a highly modified agricultural landscape, with fauna habitat largely limited to fragmented patches of remnant vegetation located outside of the Project Area. Therefore, potential impacts to terrestrial fauna are expected to be localised and primarily associated with vegetation clearing and construction activities. These may include:

- Localised loss of degraded fauna habitat resulting from the clearing of vegetation.
- Disturbance to fauna during construction activities, which may result in temporary displacement of individuals from the area.
- Reduction in habitat availability and quality within an already modified and fragmented landscape.

Given the degraded and fragmented nature of the fauna habitat in the Project Area and the limited extent of suitable habitat, impacts to terrestrial fauna are expected to be low, and largely confined to common and widespread species.

4.3.4 Mitigation and Management

Mitigation and management measures have been developed to directly address the identified terrestrial fauna impacts and are informed by the modified nature of the Project design:

- The Project has been designed to avoid the clearing of remnant native vegetation as far as practicable, with infrastructure preferentially located within previously cleared agricultural land.
- Construction activities will be confined to clearly defined work areas and undertaken progressively to limit the extent and duration of disturbance at any one time, reducing temporary displacement of fauna during works.
- Construction activities will be predominantly undertaken during daylight hours, where practicable, and confined to defined work areas to enable fauna to move away from active construction zones. Where excavations or trenches are left open overnight, they will be inspected prior to the commencement of daily works to manage any fauna interactions.
- Vehicle movements and construction activities will be restricted to designated access tracks and work zones, with no-go areas established around retained vegetation to prevent inadvertent disturbance and maintain habitat quality within the already fragmented landscape.
- A Construction Environmental Management Plan (CEMP) will be developed with appropriate measures to minimise indirect impacts to native vegetation adjacent to the Indicative Disturbance Footprint.

4.4 Soils

4.4.1 Receiving Environment

A desktop assessment was undertaken as part of this report to characterise the soil landscape for the Project Area and to understand potential risks arising from Project activities to land capability values (dryland cropping) and soil quality (DPIRD-031).

Soil landscape mapping of WA has been compiled from the results of various surveys across the State by the Department of Agriculture (now the Department of Primary Industries and Regional Development (DPIRD, 2025). The Project Area is mapped within the Southern Zone of Rejuvenated Drainage, characterised by gently undulating rises to low hills with soils formed in colluvial deposits and weathered in-situ material. The Farrar 2 Subsystem soil unit, characterised by undulating rises and low hills with mainly grey deep sandy duplex soils, is mapped within the Indicative Disturbance Footprint (**Appendix B**). These soil types typically support a Wandoo–Jarrah–Marri woodland vegetation complex.

The following soil risk profiles have previously been mapped within the Project Area or surrounding Study Area by DPIRD:

- Ease of excavation: 82% of the larger Study Area are mapped as “<5% of the map unit has a very low to low rating”.
- Land instability: The entire Study Area is mapped as “0% of map unit has a moderate to high hazard”.

- Waterlogging risk: 82% of the Study Area are mapped as ">5% of the map unit has a moderate to very high hazard".
- Acid Sulphate Soil risk: 96% of the Study Area are mapped as "High subsurface acidification susceptibility or presently acid" (DWER-049) (DWER, 2017).
- No registered contaminated sites were identified within the Project Area or within a 10 km buffer (DWER-059) (DWER, 2018).

It should be noted that the legacy DWER-049 dataset was previously used to determine acid sulphate soil risk; however, this dataset has since been retired and is no longer in use for the Project. A review of DPIRD-011 (DBCA, 2025) identified a high susceptibility of subsurface acidification risk for the Project. Soil properties should be assessed as part of the site geotechnical assessment, to determine any potential impacts as related to soil acidification.

4.4.2 Potential Impacts

Potential impacts to soil associated within the Project Area might include:

- Localised loss or temporary disturbance of productive agricultural soils within the Indicative Disturbance Footprint.
- Indirect impacts to soil quality during construction due to erosion, sediment mobilisation, dust generation, or contaminated runoff if not appropriately managed.
- Indirect impacts to soil quality during construction or operation, due to contaminated runoff, dust, or erosion and sedimentation.

The land use within the Project Area is cropping, mapped by (DPIRD-031) (DPIRD, 2025) as:

- "50-70% of the land has moderate to very high capability" (100%)

While the land is of moderate to high quality, the proposed Indicative Disturbance Footprint represents less than 0.004% of this land capability classification within the Kojonup Local Government Area (LGA). Impacts to these soil landscape units are expected to be negligible in comparison their remaining areas mapped within both Kojonup LGA and the region.

4.4.3 Mitigation and Management

It is expected that potential indirect impacts to soils as a result of the Project can be adequately managed through controls included in the CEMP, which may include but are not limited to:

- Reducing risk of contaminated or sediment laden runoff from site during construction and operations through appropriate drainage control and retention basins (as described in **Section 4.1.4**).
- Management, via the CEMP, of any deep excavations or soil disturbance that may expose or interact with acid sulphate soils.
- Storage and handling procedures for any potentially hazardous goods.
- Spill-kits and site procedures in the event of a spill.
- Dust management procedures during construction.

- Minimising impacts to cropping land by confining construction activities, laydown areas, and access tracks to the approved disturbance footprint and avoiding unnecessary disturbance of surrounding paddocks.
- Progressive rehabilitation of temporarily disturbed areas to reinstate ground cover and enable ongoing agricultural use where practicable.

4.5 Heritage

The following section summarises both Indigenous and European heritage values for the Project Area and its surrounds.

4.5.1 Aboriginal Cultural Heritage Due Diligence Assessment

The Project is located within the Gnaala Karla Booja (GKB) and Wagyl Kaip Southern Noongar (WKSN) Indigenous Land Use Agreement (ILUA) areas.

An Aboriginal Cultural Heritage (ACH) Due Diligence Assessment has been undertaken for the Project (Archae-aus, 2026) (**Appendix C**). The assessment was completed in accordance with relevant legislation, including the *Aboriginal Heritage Act 1972 (WA), Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Cth)* and *Heritage Act 2018 (WA)*.

There are no known Registered Sites or Lodged or Historic Record Places within the Project Area, although there is one Registered Site, three Lodged Places, and one Historic Place within 5 km. The assessment considers that the likelihood of encountering ACH is low in highly disturbed areas but increases to medium or high in minimally altered environments, including native bushland and drainage lines.

The Proponent has lodged a Noongar Standard Heritage Agreement (NSHA) with GKB and WKSN AC.

4.5.1.1 Potential Impacts

Potential impacts to Aboriginal cultural heritage may include:

- Direct disturbance to previously unidentified Aboriginal archaeological or ethnographic heritage values during site preparation and civil works.
- Potential disturbance to subsurface Aboriginal cultural material during excavation, underground cabling, access formation and associated infrastructure installation.
- Elevated risk of impact within remnant vegetation, drainage line areas, and other less disturbed landforms identified in the due diligence assessment as having higher Aboriginal cultural heritage potential.
- Inadvertent disturbance to culturally sensitive areas associated with temporary construction work areas, vehicle movement and ancillary disturbance outside the core infrastructure footprint.

4.5.1.2 Mitigation and Management

Effective management of Aboriginal cultural heritage for the Project will focus on minimising risks to cultural values and ensuring Traditional Owners are actively involved in decision-making processes.

This will be achieved through a staged approach to cultural heritage management implemented prior to and during construction, and integrated into Project design, planning and construction controls.

Further measures will also be implemented prior to and during construction and include the following:

- Archaeological and ethnographic heritage surveys will be undertaken, in liaison with appropriate cultural heritage advisers, in areas of proposed ground disturbance prior to works, with outcomes used to inform avoidance, design refinement, adaptive management or statutory management where required.
- Ground-disturbing activities will only proceed following completion of heritage surveys and in accordance with endorsed heritage management procedures, including unexpected finds protocols and will be responsive to any additional heritage information identified during Project delivery.
- Areas identified as having higher Aboriginal cultural heritage potential will be subject to targeted heritage surveys and, where practicable, avoided through Project design and construction planning.
- Clearly defined work boundaries, no-go areas and construction-phase heritage controls, including Traditional Owner participation where required, will be implemented to minimise the risk of unintentional impacts.

4.5.2 Historic and European Heritage Assessment

Historic and European heritage is protected under the *Heritage Act 2018* (WA), with additional protection applying under the EPBC Act for places of national significance.

No European heritage places listed as MNES under the EPBC Act, or local heritage sites have been identified in the Project Area.

Based on the available information, the Project is considered to have low potential for impacts to known historic or European heritage values.

4.5.2.1 Mitigation and Management

Given the absence of recorded heritage places, no specific mitigation measures are required.

4.6 Amenity

4.6.1 Noise

An Environmental Noise Assessment (**Appendix E**) was undertaken by Sonus (2026) to assess potential noise impacts associated with the Project on surrounding noise sensitive receivers, including nearby rural dwellings.

The assessment considered operational noise, considering proposed battery units (228), inverters (40 with noise reduction kits), transformer (1 x 120 MVA), and cumulative noise from the adjacent existing substation. The baseline conditions were informed by field measurements undertaken in June 2025. Final plant numbers and specifications will be confirmed during detailed design. The noise assessment is based on conservative scenarios and will be reviewed if subsequent design changes

would increase overall sound power levels or introduce new dominant noise sources. Worst-case meteorological conditions and a 5 dB(A) tonal adjustment in accordance with the *Environment Protection (Noise) Regulations 1997* was adopted.

The assessment predicts that cumulative noise levels from the Project and existing substation will comply with applicable regulatory criteria at all nearby dwellings during all time periods.

4.6.1.1 Potential Impacts

Potential noise impacts associated with the Project may include:

- Generation of continuous operational noise from battery units, inverters and transformers during charging and discharge cycles.
- Cumulative increase in ambient noise levels in combination with the adjacent existing substation.
- Tonal noise emissions associated with electrical infrastructure equipment.
- Temporary construction noise impacts during site establishment and installation works.

4.6.1.2 Mitigation and Management

Proposed measures to manage noise impacts include:

- Undertaking a pre-construction environmental noise assessment prior to construction with the final selected equipment and layout to confirm compliance with the applicable operational noise criteria.
- Management of temporary construction noise in accordance with Regulation 13 of the *Environmental Protection (Noise) Regulations 1997* and AS 2436-2010 *Guide to noise and vibration control on construction, maintenance and demolition sites*, including limiting construction to daytime hours.

4.6.2 Land and Visual

A Landscape and Visual Impact Assessment (**Appendix F**) was undertaken by UDLA in April 2026 to assess the potential landscape and visual effects of the Project on the surrounding rural setting, nearby public viewing locations and neighbouring sensitive receptors.

The assessment examined the indicative Project layout, infrastructure scale and height, surrounding landscape character, existing visual context, and potential visibility of the Project within a 2.5 km Project Area. This included Zones of Visual Influence and Zones of Theoretical Visibility modelling, field inspections, photomontage preparation, and viewpoint assessments from representative locations along Collie-Changerup Road and Tunney Road, together with consideration of nearby dwellings and cumulative views associated with the existing Kojonup Substation. The study concluded that the Project would be viewed within an already modified agricultural and electrical infrastructure landscape, with overall visual effects generally assessed as low to negligible from surrounding public viewpoints.

4.6.2.1 Potential Impacts

Potential landscape and visual impacts associated with the Project may include:

- Introduction of additional built electrical infrastructure into views from surrounding local roads, particularly Collie-Changerup Road and Tunney Road, where breaks in vegetation and open agricultural sightlines occur.
- Cumulative increase in the visibility of utility infrastructure where the proposed BESS is viewed in conjunction with the existing Kojonup Substation, transmission lines, and associated above-ground electrical assets.
- Localised change to the visual character of the cleared agricultural landscape through the addition of containerised battery units, onsite substation infrastructure, security fencing, and lightning protection rods.
- Partial visibility of Project infrastructure from nearby sensitive receptors where direct sightlines toward the Project footprint are available.
- Temporary visual disturbance associated with construction compounds, equipment laydown areas, and construction activity during the establishment phase.

4.6.2.2 Mitigation and Management

Landscape and visual impacts associated with the Project will be managed through the following measures:

- The location of the proposed BESS, adjacent to the existing Kojonup Substation and transmission lines, has been considered so that the development is visually read as an expansion of an established electrical infrastructure setting rather than a standalone feature within the rural landscape
- Installation of a 5 m wide vegetated landscape buffer along the northern, eastern, and western boundaries of the BESS footprint to provide layered visual screening of battery units, fencing, and associated infrastructure from surrounding road corridors and nearby receptors.
- Installation of a reduced 3 m wide planting buffer along sections of the southern boundary adjoining the onsite substation and along the diagonal eastern connection between the substation and BESS footprint, balancing visual softening with operational access, defensible space, and maintenance requirements.
- Finalisation of planting species, density, and detailed landscape treatments during detailed design to maximise long-term screening effectiveness. Landscape screening will prioritise the use of local native species consistent with the surrounding landscape character. Planting design and species selection will be undertaken in accordance with applicable bushfire protection requirements, including asset protection zone and defendable space considerations, and in liaison with relevant authorities. The exact composition, layout, and planting design will be confirmed post-approval during detailed design.
- Removal and rehabilitation of temporary construction compounds, laydown areas, and ancillary disturbance areas following completion of construction to minimise residual visual disturbance associated with construction activities.

4.6.3 Traffic and Transport

A Transport Impact Assessment (TIA) was prepared by Flyt (2026) to support the Development Application (**Appendix G**). The assessment was undertaken in accordance with the WA Planning Commission's Transport Impact Assessment Guidelines.

During construction, traffic will include light vehicles associated with the construction workforce and heavy vehicles delivering materials and equipment. Light vehicle traffic will largely reflect workforce needs, with up to 174 daily trips based on a peak construction crew of approximately 87 personnel. Heavy vehicle movements will vary by construction stage, ranging from occasional trips (e.g. fuel and waste) to more frequent daily movements during peak civil, electrical, and installation works. Approximately 168 heavy vehicle trips are expected during the BESS installation stage, with construction traffic spread across approximately 55 weeks.

The surrounding road network, including Collie-Changerup Road (Regional Distributor) and Tunney Road (Access Road), were assessed as suitable to accommodate the proposed construction and operational traffic, including heavy vehicles, and is not expected to experience a material change in capacity or safety conditions. During construction, some Project-related traffic may also access the existing Kojonup Substation via Tunney Road, consistent with existing access arrangements.

4.6.3.1 Potential Impacts

Potential impacts to traffic and transport associated with the Project are primarily related to construction-phase vehicle movements and the use of the existing rural road network:

- Increase in light and heavy vehicle movements during construction, with traffic volumes varying depending on the stage of works.
- Generation of construction traffic associated with workforce access and delivery of materials and equipment, including heavy vehicles.
- Increased turning movements at the proposed access points on Collie-Changerup Road and Tunney Road.
- Interaction between Project-related traffic and existing rural traffic on surrounding roads.
- Occasional oversized overmass (OSOM) vehicle movements requiring permits and specific traffic management measures.
- Road safety considerations associated with vehicle access to a high-speed rural road network, including sight distance requirements.

4.6.3.2 Mitigation and Management

Traffic and transport impacts associated with the Project will be managed through appropriate access design and compliance with relevant regulatory requirements**:**

- Project access intersections have been incorporated into the site design to accommodate safe turning movements from both Collie-Changerup Road and Tunney Road. The design has been developed to accommodate safe turning movements without requiring significant modification to the surrounding road network.

- Swept path analysis relates to the design verification of infrequent construction heavy vehicles only and does not represent routine day-to-day traffic movements throughout the life of the Project.
- Site access points will be designed in accordance with Main Roads WA and Shire of Kojonup standards, including provision for safe vehicle movements and adequate sight distances.
- A Traffic Management Plan (TMP) will establish safe working parameters at the site access during construction. The TMP will:
    - A Traffic Management Plan will need to be completed by the Transport Operator associated with the Project, with relevant permits and requirements covered through Main Roads WA.
    - Cover all construction periods for the site and any other agreed periods as required by Main Roads WA.
    - Provide recommendations for site-based safety measures, such as temporary reduction in speed limits on Collie-Changerup Road, signage on approach to the site access, and manual management of specific movements if required.
    - Address other safety related measures as nominated by Main Roads WA or the Shire of Kojonup.
- Heavy vehicle access and routes will be undertaken in accordance with the approved Restricted Access Vehicle (RAV) network and relevant permitting requirements.
- Temporary laydown areas, construction compounds, site offices, workforce parking, and materials storage areas will be contained within the approved disturbance footprint. These areas have been considered in the Project layout and will be managed and monitored through CEMP to ensure safe and orderly site operations during construction.

5.0 Conclusions

This EAR has been prepared to support the Development Application for the Kojonup BESS. It draws on the supporting technical studies and identifies the key environmental constraints, potential impacts, and the mitigation and management measures required for construction and operation.

The Project is located within a highly modified agricultural landscape. The indicative design largely avoids remnant native vegetation; however, minor clearing of degraded native vegetation may be required (up to approximately 0.09 ha), subject to detailed design, and any required approvals.

Hydrological investigations indicate the Project Area is subject primarily to shallow overland sheet flow during larger rainfall events, with flooding hazards predominantly classified as low; stormwater and flood mitigation measures will be incorporated into detailed design to avoid significant off-site impacts.

Surveys and assessments indicate that the Project is not expected to result in significant impacts to flora, vegetation, or terrestrial fauna. No Threatened or Priority flora species were recorded during the September 2024 survey, and the Project Footprint has been designed to avoid the Eucalyptus Woodlands of the Western Australian Wheatbelt Threatened Ecological Community. Fauna habitat within the Project Area is highly degraded and fragmented, and impacts are expected to be localised and low.

A desktop soil assessment indicates that the Project is located within land of moderate to high agricultural capability. However, impacts to soils will be limited to the small indicative disturbance footprint and are expected to be negligible at a local and regional scale. Potential soil risks, including erosion, contamination, and acidification, can be effectively managed through standard construction controls.

No registered Aboriginal heritage sites are located within the Project Area; however, areas of remnant vegetation and drainage features have the potential to contain previously unrecorded heritage, and further archaeological and ethnographic surveys and consultation will be completed prior to ground-disturbing works in accordance with statutory requirements.

Operational noise from the BESS, in combination with the existing Kojonup Substation, is predicted to comply with the applicable criteria under the *Environmental Protection (Noise) Regulations 1997*. Visual impacts are anticipated to be low to negligible within the existing electrical infrastructure context, with landscape screening to be finalised during detailed design (subject to bushfire requirements). Construction traffic would be temporary and managed through detailed access design, permitting (where required) and implementation of a Traffic Management Plan.

Overall, the Project is considered capable of being developed and operated with a low likelihood of unacceptable environmental impacts.

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Appendix A

Hydrological Assessment

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Appendix B

Reconnaissance and Targeted Flora and Vegetation Survey and Basic Terrestrial Fauna Survey

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Appendix C

Aboriginal Cultural Heritage Briefing Note

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Appendix D

Stakeholder and Community Engagement Plan and Consultation Summary

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Appendix E

Environmental Noise Assessment

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Appendix F

Landscape Visual Impact Assessment

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Appendix G

Transport Impact Assessment

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